

Appendix A

Radiocarbon Dating

The radiocarbon dating results referred to in this volume are presented below. The dates were processed during various stages of post-excavation assessment and analysis between 2001 and 2007. Seeds or waterlogged wood were the preferred material selected for dating, but in some cases where preservation was poor a sample of bulk sediment was submitted. The majority of the dates are AMS measurements processed at the Rafter Radiocarbon Laboratory, Institute of Geological and Nuclear Science, New Zealand (NZA-), and the Leibniz-Laboratory for Radiometric Dating and Isotope Research, Christian-Albrechts-University of Kiel, Germany (KIA-). Some dates, mainly in the Ebbsfleet Valley, were also processed at Waikato Radiocarbon Dating Laboratory, New Zealand (WK-), Beta Analytic Inc. Florida USA (Beta-) and the

Scottish Universities Environmental Research Centre, East Kilbride (SUERC-). Four of the dates are radiometric measurements from bulk sediment or waterlogged wood (denoted in the table *).

The radiocarbon results are quoted in accordance with the international standard known as the Trondheim convention (Stuiver and Kra 1986). They are conventional radiocarbon ages, where 0 BP is the year 1950 (Stuiver and Polach 1977; Mook 1986). All dates have been calibrated using datasets published by Reimer *et al* (2004) and the computer program OxCal (v3.10) (Bronk Ramsey 1995; 1998; 2001) with the end points rounded out to 10 years. The calibrated date ranges cited in the tables, as in the text, are those for 95.4% (2 σ) confidence.

Radiocarbon results from Temple Mills, Stratford

No	Chainage/ Trench no	Sample no	Cxt no	Depth (m OD)	Sample material	Lab code	Radiocarbon date (BP)	$\delta^{13}\text{C}$ (‰)	Calibrated date (2 σ range)
1	4042TT	4201006/7	420003	+2.62	<i>Phragmites australis</i> stem	KIA-24052	4610 \pm 35	-24.57	3520–3130 cal BC
2	4042TT	4201006/7	420003	+2.49	Twig fragment (indet.)	NZA-30301	4589 \pm 30	-25.60	3500–3120 cal BC
3	4042TT	4201006/7	420003	+2.29	Wood (indet.)	NZA-30332	8865 \pm 30	-25.60	8220–7830 cal BC
4	4042TT	4201006/7	420003	+1.84	<i>Phragmites australis</i> stem	KIA-24051	10305 \pm 50	-28.35	10450–9850 cal BC
5	4044TT	441016	420004	+2.73	3 outer rings of mature wood (indet.)	KIA-24588	3650 \pm 35	-31.91	2140–1920 cal BC
6	4044TT	441016	420004	+2.67	Horizontal root (indet.)	KIA-24589	3690 \pm 35	-26.67	2200–1960 cal BC
7	4044TT	441016	420004	+2.39	Wood (indet.)	KIA-24590	3980 \pm 30	-26.75	2580–2450 cal BC
8	4044TT	441016	420006	+2.22	Wood (indet.)	KIA-24591	4435 \pm 40	-26.15	3330–2920 cal BC

Radiocarbon results from West Dagenham Marshes

No	Chainage/ Trench no	Sample no	Cxt no	Depth (m OD)	Sample material	Lab code	Radiocarbon date (BP)	$\delta^{13}\text{C}$ (‰)	Calibrated date (2 σ range)
9	20.500km	1025	2043	-2.49	Roundwood (<i>Betula</i>)	NZA-28798	3952 \pm 35	-28.10	2570–2340 cal BC
10	20.500km	1026	2044	-3.75	Peat	NZA-28794	5773 \pm 40	-28.70	4720–4520 cal BC
11	20.600km	1031	2061	-1.70	Seeds (<i>Carex</i>)	NZA -28710	-413 \pm 30	-24.80	1952 cal AD onwards

Radiocarbon results from West Dagenham Marshes continued

No	Chainage/ Trench no	Sample no	Cxt no	Depth (m OD)	Sample material	Lab code	Radiocarbon date (BP)	$\delta^{13}\text{C}$ (‰)	Calibrated date (2 σ range)
12	20.600km	1033	2062	-3.38	Seeds (<i>Ranunculus ficaria</i>)	NZA-28769	4841±60	-26.00	3770–3380 cal BC
13	3780TT	21	8004	-1.75	Peat	WK-11595	3177±49	-27.70	1610–1310 cal BC
14	21.090km	123	105	-1.39	Seeds (<i>Rubus</i> , <i>Cirsium</i> , <i>Euonymus</i> , <i>Ranunculus</i> , <i>Carex</i> , <i>Eleocharis</i>)	NZA-16262	2270±45	-27.64	410–200 cal BC
15	20.970km	273	126	-3.30	Seeds (<i>Alnus</i>)	NZA-16263	4733±40	-24.68	3640–3490 cal BC
16	20.970km	275	128	-3.88	Roundwood (<i>Alnus</i>)	NZA-16264	5751±40	-26.51	4710–4500 cal BC

Radiocarbon results from East Dagenham and Hornchurch Marshes

No	Chainage/ Trench no	Sample no	Cxt no	Depth (m OD)	Sample material	Lab code	Radiocarbon date (BP)	$\delta^{13}\text{C}$ (‰)	Calibrated date (2 σ range)
17	22.950km	289	199	-1.32	Seeds (<i>Rubus</i> , <i>Alnus</i> , <i>Ranunculus</i>)	NZA-16265	4297±40	-29.38	3030–2870 cal BC

Radiocarbon results from Rainham and Wennington Marshes

No	Chainage/ Trench no	Sample no	Cxt no	Depth (m OD)	Sample material	Lab code	Radiocarbon date (BP)	$\delta^{13}\text{C}$ (‰)	Calibrated date (2 σ range)
18	24.455km	253/256	193	-0.98	Seeds (<i>Alnus</i> , <i>Urtica</i> , <i>Ranunculus</i>)	NZA-16266	4601±40	-28.66	3520–3110 cal BC
19	3972TT	129	5	-0.70	Peat	WK-11596	2352 ±46	-28.70	750–200 cal BC
20	3972TT	145	7	-0.93	Seeds and bud scale (<i>Rubus</i> , <i>Carex</i>)	NZA-16267	3150±50	-29.65	1530–1300 cal BC
21	3972TT	137	9	-1.87	Seeds and catkin fragments (<i>Alnus</i>)	NZA-16268	3424±40	-28.23	1880–1620 cal BC
22	3972TT	112	13	-3.86	Seeds and cone axis (<i>Alnus</i>)	NZA-16269	5378±40	-26.36	4340–4050 cal BC
23	26.535km	372	234	-0.26	Charred cereal grains (undif.)	NZA-16270	766±40	-23.52	1180–1300 cal AD
24	26.535km	369	236	-0.96	Seeds (<i>Ranunculus</i>)	NZA-16271	2815±45	-26.63	1120–840 cal BC
25	26.800km	402	273	-3.20	Seeds and catkin axis (<i>Alnus</i>)	NZA-16272	4171±45	-27.60	2890–2620 cal BC
26	27.460km	431	269	-0.47	Seeds (<i>Potentilla patustris</i>)	NZA-16273	584±40	-27.31	1290–1420 cal AD
27	27.460km	429	271	-0.92	Seeds (<i>Eleocharis</i> , <i>Carex</i>)	NZA-16299	3217±40	-26.90	1610–1410 cal BC

Radiocarbon results from Aveley Marsh

No	Chainage/ Trench no	Sample no	Cxt no	Depth (m OD)	Sample material	Lab code	Radiocarbon date (BP)	$\delta^{13}\text{C}$ (‰)	Calibrated date (2 σ range)
28	28.518km	530	375	-0.72	Roundwood (<i>Alnus</i>)	NZA-27527	3090±30	-28.5	1430–1270 cal BC
29	28.518km	529	376	-1.25	<i>Alnus</i> cones	NZA-27522	3601±30	-27.9	2040–1880 cal BC
30	28.518km	529	377	-1.48	Roundwood (indet.)	NZA-27534	3629±30	-29.9	2130–1900 cal BC
31	28.518km	528	378	-1.63	Roundwood (<i>Alnus</i>)	NZA-27625	3912±40	-27.1	2560–2230 cal BC

Radiocarbon results from Aveley Marsh continued

No	Chainage/ Trench no	Sample no	Cxt no	Depth (m OD)	Sample material	Lab code	Radiocarbon date (BP)	$\delta^{13}\text{C}$ (‰)	Calibrated date (2 σ range)
32	28.518km	528	378	-1.88– 1.91	Roundwood (indet.)	NZA-27528	3909 \pm 30	-28.8	2480–2290 cal BC
33	3984TT	8224	8450005 Gp 10004	+0.15	Roundwood (indet.)	NZA-27551	3757 \pm 35	-29.5	2290–2030 cal BC
34	3984TT	8424	8450005 Gp 10004	+0.02	Roundwood (indet.)	NZA-27552	3572 \pm 40	-28.2	2030–1770 cal BC

Radiocarbon results from the Thames River Crossing, Thurrock

No	Chainage/ Trench no	Sample no	Cxt no	Depth (m OD)	Sample material	Lab code	Radiocarbon date (BP)	$\delta^{13}\text{C}$ (‰)	Calibrated date (2 σ range)
35	BH 3742	-	-	-1.66	Plant stem	KIA-14419	1970 \pm 30	-26.79	50 cal BC – 110 cal AD
36	BH 3742	-	-	-6.01	Roundwood (<i>Alnus</i>)	KIA-14420	4115 \pm 30	-29.02	2870–2570 cal BC
37	BH 3742	-	-	-11.02	Roundwood (<i>Alnus</i>)	KIA-14421	6960 \pm 40	-29.41	5980–5740 cal BC

Radiocarbon results from Thames River Crossing, Swanscombe

No	Chainage/ Trench no	Sample no	Cxt no	Depth (m OD)	Sample material	Lab code	Radiocarbon date (BP)	$\delta^{13}\text{C}$ (‰)	Calibrated date (2 σ range)
38	3880TT	17	3880–4	-1.95	Roundwood (indet.)	NZA-29088	5004 \pm 40	-25.30	3950–3690 cal BC
39	3880TT	17	3880–4	-1.65	Roundwood (indet.)	NZA-29087	4707 \pm 35	-26.20	3640–3370 cal BC
40	3880TT	2	3880–4	-0.75	Roundwood (indet.)	NZA-29086	3372 \pm 35	-27.00	1750–1530 cal BC
41	3880TT	21	3880–4	-1.5	Bulk sediment	NZA-29085	7112 \pm 40	-30.50	6070–5900 cal BC
42	35.255km	-	3	-	Red deer antler	NZA-28891	4948 \pm 30	-20.50	3790–3650 cal BC
43	BH 3751	-	-	-0.20	Bulk sediment	NZA-27529	4497 \pm 30	-27.80	3350–3090 cal BC
44	BH 3751	-	-	-0.85	Seeds (<i>Schoenoplectus lacustris/tabarnaemontani</i>)	NZA-27523	2891 \pm 30	-24.50	1210–970 cal BC
45	BH 3751	-	-	-3.2 to -3.3	Plant stem	KIA-14422	3310 \pm 35	-25.46	1690–1500 cal BC
46	BH 3751	-	-	-3.81	Bulk peat	NZA-27530	4402 \pm 30	-28.10	3270–2910 cal BC
47	BH 3751	-	-	-4.39	<i>Phragmites</i> stem	NZA-27602	4655 \pm 30	-26.20	3520–3360 cal BC
48	BH 3751	-	-	-4.63	<i>Phragmites</i> stem	NZA-27636	5091 \pm 35	-25.20	3970–3790 cal BC
49	BH 3751	-	-	-4.71	<i>Phragmites</i> stem	NZA-27605	5244 \pm 35	-26.20	4230–3970 cal BC
50	BH 3751	-	-	-4.97	Plant stem	KIA-14478	5095 \pm 35	-25.48	3970–3790 cal BC
51	BH 3751	-	-	-8.61	Roundwood (<i>Betula</i>)	NZA-27603	6357 \pm 35	-28.20	5470–5220 cal BC
52	BH 3751	-	-	-8.77	Plant stem	KIA-14479	6935 \pm 35	-25.88	5900–5730 cal BC
53	BH 3751	-	-	-8.89	<i>Phragmites</i> stem	NZA-27599	7669 \pm 50	-27.00	6610–6430 cal BC
54	BH3852	-	-	-6.61	Wood/seeds (indet.)	KIA-14480	6325 \pm 35	-26.98	5380–5210 cal BC
55	BH 3862	-	-	-3.53 to -3.63	Wood (indet.)	KIA-14481	5035 \pm 35	-29.63	3950–3710 cal BC
56	BH 3864	-	-	-2.68	<i>Corylus</i> nutshell	KIA-14882	5330 \pm 45	-29.54	4330–4040 cal BC

Radiocarbon results from the Ebbsfleet Valley

No	Chainage/ Trench no	Sample no	Cxt no	Depth (m OD)	Sample material	Lab code	Radiocarbon date BP	$\delta^{13}\text{C}$ (‰)	Calibrated date (2 σ range)
EBBS97									
57	BH5	-	-	-4.37	Roundwood (indet.)	Beta-108111	5770±60	-28.3	4730–4490 cal BC
58	BH9	-	-	-2.66	Roundwood (indet.)	Beta-108112	5260±60*	-28.3	4240–3960 cal BC
59	BH11	-	-	-6.18 to -6.23	Charred <i>Corylus</i> nutshell	Beta-108113	6420±60	-25.5	5490–5310 cal BC
60	Tr 2	-	211	3.80/ 0.40	<i>Corylus</i> nutshell	Beta-108114	4480±40	-28.9	3350–3020 cal BC
STDR4									
61	BH7	Core 3	-	+0.88	<i>Sambucus</i> seeds	NZA-28620		-25.3	710–940 cal AD
62	BH7	Core 13	-	-2.38	<i>Carduus/Cirsium</i> sp. seed	NZA-28973	3527±30	-27.2	1940–1750 cal BC
63	BH7	Core 15	-	-2.86	<i>Rubus</i> sp. seed	NZA-28971	3836±50	-27.0	2470–2140 cal BC
64	BH7	Core 17	-	-3.36	<i>Alnus glutinosa</i> twig	NZA-28869	4448±30	-29.2	3340–2940 cal BC
65	BH7	Core 17	-	-3.79	<i>Alnus glutinosa</i> mature wood, outer rings	NZA-28867	4820±25	-23.0	3700–3520 cal BC
66	BH7	Core 21	-	-4.68	2 <i>Alnus glutinosa</i> seeds	NZA-28972	5263±55	-27.2	4240–3970 cal BC
67	BH7	Core 21	-	-4.94	3 <i>Alnus glutinosa</i> seeds	NZA-28974	5464±35	-26.6	4370–4240 cal BC
68	BH7	Core 25	-	-6.30 to -6.39	Bulk sediment	WK-8801	6340±80*	-28.6	5480–5070 cal BC
69	BH7	Core 27	-	-6.73	Bulk sediment	NZA-28766	9122±55	-30.3	8540–8240 cal BC
70	BH8	-	-	-6.34 to -6.43	Bulk sediment	WK-8802	5880±60*	-	4910–4580 cal BC
71	Tr 9	103	910	+0.72	Bulk sediment	SUERC-16657 (GU-16003)	1290±35	-28.2	650–810 cal AD
72	Tr 9	104	912	+0.33	Bulk sediment	SUERC-16658 (GU-16004)	1740±35	-28.4	220–410 AD
73	Tr 9	104	914	+0.04	Bulk sediment	SUERC-16659 (GU-16005)	3840±35	-27.2	2460–2200 cal BC
74	Tr 9	105	916	-0.03	Bulk sediment	SUERC-16660 (GU-16006)	2605±35	-28.7	840–590 cal BC
75	Tr 9	105	916	-0.31	Bulk sediment	SUERC-16661 (GU-16007)	2820±35	-28.1	1120–890 cal BC
76	Tr 9	105	918	-0.58	Bulk sediment	SUERC-16662 (GU-16008)	3725±35	-26.7	2280–2020 cal BC
77	Tr 9	107	934	-1.89	<i>Alnus glutinosa</i> roundwood	NZA-29077	4663±35	-27.7	3620–3360 cal BC
78	Tr 9	107	934	-2.32	<i>Alnus glutinosa</i> roundwood	NZA-29080	4926±35	-27.8	3780–3640 BC
79	Tr 11		1119		Waterlogged roundwood from peat around Ebbsfleet Ware pot	WK-8799	4730±70 *	-28.4	3640–3360 cal BC
80	Tr 11	Ves1	1119		Charred residue from Ebbsfleet Ware pot	NZA- 29079	4723±35	-26.1	3640–3370 cal BC
81	Tr 11		1119		Waterlogged <i>Corylus</i> nutshell from peat around Ebbsfleet Ware pot	WK-8800	4696±75	-28.6	3650–3340 cal BC
82	Tr 11	Ves2	1119		Charred residue from Ebbsfleet Ware pot	NZA- 29155	4547±35	-28.5	3370–3100 cal BC

* Radiometric measurements from bulk sediment or waterlogged wood

Radiocarbon results from the Ebbsfleet Valley continued

No	Chainage/ Trench no	Sample no	Cxt no	Depth (m OD)	Sample material	Lab code	Radiocarbon date BP	$\delta^{13}\text{C}$ (‰)	Calibrated date (2 σ range)
83	Area 1	-	1071	-	Roundwood (cf <i>Frangula alnus</i>)	SUERC-19949	2615 \pm 30	-26.4	835–765 cal BC
84	Area 1	-	1012	-	Cattle femur	SUERC-19947	2385 \pm 30	-21.8	730–390 cal BC
85	Area 4	-	Str 4027 (4033)	-0.59	<i>Alnus glutinosa</i> , waterlogged roundwood	SUERC-19950 (GU-17164)	4120 \pm 30	-27.9	2870–2570 cal BC
86	Area 4	432	4043	-2.19	<i>Corylus</i> nutshell	NZA-29247	4945 \pm 35	-23.6	3800–3650 cal BC
87	Area 4	491	4053	-2.24	<i>Corylus</i> charred nutshell	NZA-29246	5405 \pm 35	-24.3	4350–4070 cal BC
ARCERC01									
88	-	134	466	-	<i>Prunus</i> sp. roundwood charcoal	NZA-28445	3379 \pm 35	-25.8	1760–1530 cal BC
ARCEBB01									
89	-	11153	15086	-	Cremated human bone	NZA-28208	3113 \pm 30	-22.0	1450–1300 cal BC
ARC342W 02									
90	-	-	246	-	<i>Quercus</i> sp. waterlogged wooden pile tip, mature outer rings	NZA- 28703	3055 \pm 30	-25.9	1410–1220 cal BC

Appendix B

Soil Micromorphology Tables

Soil micromorphology: Samples and counts

	Thin section (from monolith)	Context number	Depth in monolith (cm)	Micro-facies	SMT	Voids (%)	Fe-roots traces	Roots	Fine organic matter	Burnt flint	Coarse quartzite	Charcoal	Humified peat	More humus	Moder humus	Textural clay
20.5km Ripple Lane Portal, West Dagenham Marsh	1026A	2044/2045	110-110.5	C2	3b-3c	30		aa	aaaa			a	aaa	aaa	aaa	
	1026A	2045	110.5-118	C1	3a-3b	40		aaaaa	aa (aaaa)	a-1			aa	aaaa		
24.455km East of Ferry Lane, Rainham Marsh	256A	193a	0-6.5	B4	2a-2b	35		aaaaa	aaaaa			a*	aaa			
	256B	193b	9.5-11.5	B1	2a	25		aaa	aaaa	a*		a*				
	256B	192	11.5-17	A3	1	5-15		a	aa	aaaa	a-2	a(aa)				
26.535km Wennington Marsh	366	233	28-30	E2	5a	25	a*		aaa	(a-1)		(aaa)				
	366	234	30-36	E1	5a	5-10	a*		aaa		1xFlint	(aaa)				
27.460km Wennington Marsh	438	268	7-9	E1	5a/5ac	20	a*	a*	aaa(aaaa)			(aaaa)	(aaaa)			
	438	269	9.0-9.5	B1	2a	20	a	aa	aaaaa				aaaaa			
	438	269	9.5-15	E2	5b, 5c	35	a	a	aaaa			(aaa)	(aaa)			
BH3748 Thames Crossing Swanscombe	3748A	na	24-32	D8/D7	2c/4b2	30	a	aa	aaaa			a*				
	3748B	na	32-40	D7	4b2	30	a*	aaaaa	aaaa			a*				
3880TT Thames Crossing Swanscombe	17A	388004/6	42-50	D3	4c	45		aaaaa	aaaa			a*				
	17B	388006	50-54	D2	4b	5-20		aaa	aa	aaa		a*				
	17B	388006/5	54-57.5	D1	4a	20		aaa	a*							aa
	21A	388004/6	0-7.5	D6	4e, 4f1, 4f2	5-25		aaaaa	a*(aa/aaaa)	aa		a	aa			a*
	21B	388006	7.5-15	D6	4e, 4f1, 4f2	5-25		aaaaa	a*(aa/aaaa)	a*?			aa			a
	21C	388006	38.5-43.5	D5	4d	30		aa	a*							aaaaa
21C	388005	43.5-46.5	D4	4a	25		aaa	a*								

* - very few 0-5% f - few 5-15% ff - frequent 15-30% fff - common 30-50% ffff - dominant 50-70% fffff - very dominant >70%,
a - rare <2% (a*1%; a-1, single occurrence) aa - occasional 2-5% fff - common 30-50% ffff - dominant 50-70% fffff - very dominant >70%,
aaaa - abundant 10-20% aaaa - very abundant >20%

Soil micromorphology: samples and counts continued

	Thin section (from monolith)	Context number	Depth in monolith (cm)	Micro-facies	SMT	Textural intercal	Textural silt	Bedding	2ndry Fe	Pyrite	Gypsum	Nodular carbonate	<500 um burrows	Broad burrows	Granule
20.5km Ripple Lane Portal, West Dagenham Marsh	1026A	2044/2045	110-110.5	C2	3b-3c			f	a				aa		
	1026A	2045	110.5-118	C1	3a-3b			f	a				aaa	aa	
24.455km East of Ferry Lane, Rainham Marsh	256A	193a	0-6.5	B4	2a-2b			ff	a			aaaa	aaaa		
	256B	193b	9.5-11.5	B1	2a				a-1			aa			
	256B	192	11.5-17	A3	1		aaa		a*						
26.535km Wennington Marsh	366	233	28-30	E2	5a	a		(ffff)	aa(aaaa)				aaa	aaa	a-1 (shlg?)
	366	234	30-36	E1	5a	aa			aa(aaaa)				aaa	aaa	a-2
27.460km Wennington Marsh	438	268	7-9	E1	5a/ac			ffff	aaa				a	aa	
	438	269	9.0-9.5	B1	2a			(ffff)	aaaa				aa		
	438	269	9.5-15	E2	5b, 5c				aa	a*	a*		aa	aaaaa	
BH3748 Thames Crossing Swanscombe	3748A	na	24-32	D8/D7	2c/4b2			fff	aa		aa		aa		
	3748B	na	32-40	D7	4b2			fff	a		aa		aa		
3880TT Thames Crossing Swanscombe	17A	388004/6	42-50	D3	4c	aaa	aa					aaaa			
	17B	388006	50-54	D2	4b	aaa				a*	a				
	17B	388006/5	54-57.5	D1	4a					aa	a*				
	21A	388004/6	0-7.5	D6	4e, 4f1, 4f2	aaa	aaaa		aa			aaa			
	21B	388006	7.5-15	D6	4e, 4f1, 4f2	aaa	aaaa		aa			aaa			
	21C	388006	38.5-43.5	D5	4d	aaaaa		(ff)	aaa	a*	a*	aaa			
	21C	388005	43.5-46.5	D4	4a				aa			aa			

* - very few 0-5% f - few 5-15% ff - frequent 15-30% fff - common 30-50% ffff - dominant 50-70% fffff - very dominant >70%,
a - rare <2% (a*1%; a-1, single occurrence) aa - occasional 2-5% fff - common 30-50% ffff - dominant 50-70% fffff - very dominant >70%,
aaa - many 5-10% aaa - abundant 10-20% aaaa - very abundant >20%

20.5km Ripple Lane Portal, West Dagenham Marsh

Microfacies type (MFT) and Soil microfabric type (SMT)	Thin section	Depth (from top of monolith) and Soil micromorphology (SM)	Interpretation and Comments
MFT C2 SMT 3b and 3c	1026A	110–110.5cm: Homogeneous bedded and layered <i>Microstructure</i> : massive with fine (2–4mm) layering; 30% simple and complex packing voids and poorly formed planar voids <i>Coarse mineral</i> : C:F, 35:65 (F= SMT 3b; amorphous organic matter); moderately well sorted coarse silt-very fine sand <i>Coarse organic and anthropogenic</i> : very abundant flattened coarse horizontal plant tissues and organs (leaves, lignified plant remains, roots); occasional sand-size charcoal/charred plant remains in lower thinly layered beds <i>Fine fabric</i> : SMT 3b (as below, but with abundant tissues and organs) in lower beds; upwards – SMT 3c: pale yellowish brown to brown (PPL), isotropic (undifferentiated b-fabric, XPL), very dark yellowish to blackish brown (OIL); layered plant fragments and pelley amorphous organic matter (poorly humified moder) <i>Pedofeatures</i> : very abundant very thin to thin (100–500µm) aggregated organic excrements. Sloping and irregular boundary	2044: Above sloping and irregular boundary, there are initially bedded fine sands and silts and humified organic matter (mor humus), which includes rare charcoal/charred organic fragments; upwards – layers of horizontal compact plant fragments and intercalated pelley amorphous organic matter <i>Renewed colluviation (possibly of anthropogenic origin) containing charcoal within humic fine sands and silts – and associated erosion of 2045?, becoming a moder humus under presumed woodland (producing coarse roots present here and in 2045)</i>
MFT C1 SMT 3a and 3b		110.5–118cm: Heterogeneous (common SMT 3a and 3b) <i>Microstructure</i> : massive with weak layering; 40% voids, few very fine (0.5mm) and dominant very coarse (max 20mm) root channels, complex packing voids <i>Coarse mineral</i> : C:F, 95:05 (SMT 3a) and 80:20 (SMT 3b); SMT 3a: moderately poorly sorted very fine and medium sand-size subangular to rounded quartz (and feldspar), with coarse silt; SMT 3b: moderately sorted coarse silt, with fine and medium sand; also fragments of thin (0.5mm) bands mixed silt and sand <i>Coarse organic and anthropogenic</i> : very abundant coarse (max 20mm) woody roots, occasional horizontal very fine (0.5mm) fleshy roots; examples of sand-size calcined flint and other whitened mineral grains <i>Fine fabric</i> : SMT 3a: as SMT 3b (pelley and coated); SMT 3b: blackish brown (PPL), isotropic (pelley [microaggregates], coated and bridged, undifferentiated b-fabric, XPL), very dark reddish to blackish brown (OIL); very abundant amorphous fine organic matter, with occasional tissues and organs; spores/pollen present <i>Pedofeatures</i> : Amorphous: very weak ferrugination of some roots. Fabric: many thin to broad (1–2mm) burrows. Excrements: very abundant very thin to thin (100–500µm) aggregated organic excrements	2045: Bioturbated sands and humic silts, with fine to very coarse (woody) roots; fine amorphous organic matter is as highly humified microaggregates (excrement pellets); rare traces of fine sand-size burnt flint and other minerals <i>Once-bedded sands and humic silts formed as accreting sands and humic silts, with contemporary weathering and biological activity forming a Ah/mor horizon acidic topsoil; possibly colluvial sediments include rare traces of burnt flint from nearby (upslope) occupation; subsequently coarsely rooted</i>

24.455km East of Ferry Lane, Rainham Marsh

Microfacies type MFT) and Soil microfabric type (SMI)	Thin section	Depth (from top of monolith) and Soil micromorphology (SM)	Interpretation and Comments
MFT B4 SMT 2a–2b	256A	0–6.5cm: Heterogeneous (layered and burrowed) <i>Microstructure</i> : massive, burrowed and channel; 35% voids, coarse (5mm) root channels and simple packing voids <i>Coarse mineral</i> : C:F, 85:15 (fragments coarse silt sediment) to 65:35 (minerogenic peat) <i>Coarse organic and anthropogenic</i> : very abundant coarse (max 6mm) plant roots (possible woody roots) and lignified/bark(?) fragments, with abundant coarse patches of burrowed humified amorphous organic matter and wood/plant fragments; rare traces of sand-size charcoal <i>Fine fabric</i> : SMT 2a and 2b (coarsely mixed) <i>Pedofeatures</i> : Amorphous: rare ferruginisation of some plant fragments and peat. Fabric: abundant to thin to broad burrows; very broad burrow/root mixing. Extremes: abundant thin to broad organic excrements, some associated with humified peat fragments	193a: Coarsely biologically mixed broadly layered peat and minerogenic peat, with patches and fragments of humified peat and plant/woody fragments <i>Finely and coarsely mixed minerogenic peat and humified (wood?) peat layers, by both rooting and mesofauna activity; implies fluctuating water tables and exposure episodes</i>
MFT B1 SMT 2a	256B	9.5–11.5cm: Homogeneous; as thin section 1C, SMT 2a, MFT B1 (described below), with rare traces of fine burnt flint and charred OM and charcoal M1C, SMT 2a, MFT B1 <i>Microstructure</i> : massive, with ~8mm layering/bedding; channel; 25% voids, medium to coarse (2–10mm) channels, simple packing voids <i>Coarse mineral</i> : C:F, 65:35, thin beds of well sorted coarse silt, with very fine sand; patches and thin beds of very poorly sorted coarse silt to medium sand (mineralogy as below) <i>Coarse organic and anthropogenic</i> : very abundant coarse (2–10mm) plant roots (possible woody roots) and fragments, some showing horizontal orientation <i>Fine fabric</i> : SMT 2a: speckled reddish brown (PPL), isotropic (open to close porphyric, undifferentiated b-fabric, XPL), brown with reddish brown (OIL); very abundant amorphous organic matter, with organ and tissue fragments; parenchymatous cells etc; both blackening and browning of plant material; fine pelley excremental material?; rare traces of phytoliths <i>Pedofeatures</i> : Amorphous: rare example of iron hypocoating on a fine sub-vertical channel. Moderately sharp, gently sloping boundary; very finely burrowed junction	193b: minerogenic peat with trace amounts of burnt fine flint and charcoal present; thin burrowing <i>Biologically worked base of minerogenic peat, with trace amounts of anthropogenic inclusions (picked up locally?)</i>
MFT A3 SMT 1		11.5–17cm: Moderately heterogeneous (silt inwash) <i>Microstructure</i> : massive, with crack/channel; <5%, 15% open vughs, fine (3mm) channels and coarse (1mm) cracks; simple packing voids <i>Coarse mineral</i> : C:F, 80:20, with frequent gravel-size angular quartzite and flint (see below); example of fragmenting weathered glauconite <i>Coarse organic and anthropogenic</i> : rare coarse root; abundant coarse (1.1mm) burnt (rubefied and calcined) flint, with 2 coarse (12mm) angular quartzite fragments; rare 2mm charcoal <i>Fine fabric</i> : SMT 1 (with trace of fine charcoal) (occasional rounded fine charcoal/blackened organic matter in silt inwash) <i>Pedofeatures</i> : Textural: many coarse silt inwash as 2–3mm wide fills (ex-burrows/root channels?) – merging boundaries with surrounding 'soil'; include fine rounded charcoal and amorphous organic matter. Amorphous: rare traces of fine weak iron impregnations	Context 192: Artefact- (burnt coarse and fine flint with coarse quartzite) rich poorly sorted coarse silt-medium weakly humic sands, with rare 2mm size charcoal; compact (collapsed structure with probable loss of fines); broad burrow/channel infills of coarse silt and fine charcoal; rare coarse roots <i>Possible truncated in situ occupation soil rich in burnt artefacts, with inundation causing loss of structure (loss of fines), associated with coarse silt inwash carrying fine detrital charcoal</i>

26.535km Wennington Marsh

Microfacies type (MFT) and Soil microfabric type (SMT)	Thin section	Depth (from top of monolith) and Soil micromorphology (SM)	Interpretation and Comments
MFT E2/SMT 5a	366	<p>28–30cm Mainly homogeneous (with burrows) <i>Microstructure</i>: massive, channel and vuggy, 25% voids, very fine (<1mm) vughs and channels, very few 1mm size root channels <i>Coarse mineral</i>: C:F, 40:60, moderately poorly sorted coarse silt-very fine sand- and medium and coarse sand-size subangular quartz (quartzite), with examples of flint <i>Coarse organic and anthropogenic</i>: rare root traces; rare fine (200µm) charcoal and rare to occasional plant fragments; example of coarse sand-size (1mm) weakly burnt (calcined) ferruginous chert and partially weathered biogenic calcite (slug plate) <i>Fine Fabric</i>: SMT 5a <i>Pedofeatures</i>: as below, with burrowed boundary – two broad 2mm wide burrows</p>	<p>233: Moderately poorly clayey sediment containing coarse silt, very fine to coarse sand, including burnt coarse sand-size chert and much fine charred and amorphous organic matter fragments; burrowed with example of possible slug plate; rooted; depleted and iron stained as below; sharp but burrowed boundary to clayey 234</p> <p><i>Moderately poorly sorted very fine to coarse sandy loam sediment, that was possibly erosive (removing weathered/ripened clay surface from 234; see below), and which contains anthropogenic inclusions (burnt mineral and charcoal); fine sand inwash/sedimentation infiltrated 234 below; probable biological homogenisation of sediment; burrowing affected boundary to 234</i></p>
MFT E1/SMT 5a		<p>30–36cm: Mainly homogeneous (30–33cm) and mainly clayey, and moderately heterogeneous (partly burrowed) laminated (33–36cm: silty and clayey, with 1mm thick coarse silt/very fine sand bed/injection/inwash – associated with 4mm wide fill – from 233?) <i>Microstructure</i>: massive (30–33cm) and laminar (33–36cm; 350–500µm thick, even, parallel beds, with minor wavy, parallel at base), 5–10% voids, fine sub-horizontal planar voids and very fine vughs, simple packing voids; trace examples of fine vesicles; very few fine channels <i>Coarse mineral</i>: C:F (Coarse: Fine limit at 10µm), 60/90: 40/10 (silty) and 10:90 (clayey), well sorted medium and coarse silt-size quartz (and mica), with few very fine sand-size quartz, very few fine and medium sand-size subrounded clasts of reddish brown clay; example of gravel-size (3mm) flint <i>Coarse organic and anthropogenic</i>: many very fine (max 250µm) charred organic matter and sub-horizontally oriented plant fragments, fine sand-size amorphous organic matter present; two eggs of 1mm size earthworm granules, 3mm size flint; rare 1mm root traces (Fe stained channels) <i>Fine fabric</i>: SMT 5a: finely speckled, pale to darkish brown (PPL), low to moderately high interference colours (mainly open to very open porphyric, speckled and weakly developed unistrial b-fabrics (patches of weak crystallitic), XPL), grey to pale reddish brown (OIL); very thin to moderate humic staining, with rare to occasional very fine charred and amorphous OM; pollen/spores, calcite and phytoliths present <i>Pedofeatures</i>: Textural: rare intercalations and associated vesicles, associated clayey void coatings (500µm at base of burrow). Depletion: patchy probable iron depletion, especially in upper 3cm Amorphous: abundant weak Fe staining and occasional (later? rooting?) moderately strongly impregnative Fe. Fabric: many thin to broad (1–2 mm) burrows, associated with unistrial b-fabric in places, contain mixed clay, iron-stained fragmented clay and organic matter</p>	<p>234: Finely (350–500µm thick) laminated (mainly even, parallel beds), silt (with very fine sand) & clay, becoming massive clayey upwards, with thin to broad burrows and a 3mm example of flint, with two earthworm granules; much detrital very fine charred and amorphous organic matter (oriented in lower laminated part); burrowed areas include clay fragments with included clay clasts and organic matter; vesicles, intercalations, part burrow clay void coatings; much weak iron staining (more Fe depleted in massive upper part); later fine root iron staining/depletion features. (BD: organic content reflected by 3.85% LOI, iron staining by χ_{max})</p> <p><i>Laminated silt and clay estuarine sediment became more massive clayey upwards (diminished energy – cut-off from sea/reclaimed marsh?); earthworm working & ripened humic clay surface (now truncated) worked down profile. Relative 'high' 2.37% χ_{conv} may reflect relict (post-waterlogging) magnetic susceptibility of in sediment fine burnt material</i></p> <p><i>Both 233 and 234 can be associated with human landscape management and activities</i></p>
		<p>BD 234: 3.85% LOI, 0.766 mg g⁻¹ Phosphate-P, 14.6 x 10⁻⁸ SI χ, 2.37% χ_{conv}, BD 235: 3.30% LOI, 0.810 mg g⁻¹ Phosphate-P, 14.6 x 10⁻⁸ SI χ, 1.727% χ_{conv}.</p>	<p>235: Bulk data evidence of probably similar origins to 234</p>

27.460km Wennington Marsh

Microfacies type (MFT) and Soil microfabric type (SMT)	Thin section	Depth (from top of monolith) and Soil Micromorphology (SM)	Interpretation and Comments
MFT E1 SMT 5a/5ac	438	7–9cm: Heterogeneous/layered (a: clayey, b: very fine sandy, c: fine charcoal-rich). <i>Microstructure</i> : laminar (2–4mm thick laminates); Coarse Mineral: C:F, a: 05:95, b: 90:10, c: 15:85 <i>Coarse organic and anthropogenic</i> : rare fine root remains; laminae with very abundant fine 'peat' and OM fragments, and laminae with very abundant fine charred OM <i>Fine fabric</i> : a and c: as in M234; c: speckled and very heavily dotted (PPL), moderate interference colours (open porphyric, speckled b-fabric, XPL), greyish brown with very abundant black inclusions; humic stained with very abundant humified, blackened and charred fine OM and tissues <i>Pedofeatures</i> : Amorphous: many weak to moderate iron staining. Fabric: occasional broad burrows (eg, mixing fine sands)	268: multiple thin (2–4mm) laminations of very fine sand, humic clay containing silt and very fine sand, with high concentrations of blackened and charred fine organic matter <i>Alluviation, depositing clean very fine sand, and clayey silts rich in detrital and locally(?) eroded weathered peat and background fine charcoal</i>
MFT B1 SMT 2a		9–9.5cm: Homogeneous <i>Microstructure</i> : very fine laminar with fine planar; 20% voids, very fine planar and fine chambers <i>Coarse mineral</i> : C:F, 05:95, well sorted coarse silt, very fine sand <i>Coarse organic and anthropogenic</i> : occasional medium (1000–1250µm) fleshy roots (post-peat?), abundant sub-horizontal monocolydonous plant fragments and very abundant amorphous organic matter (reddish brown, humified) <i>Fine fabric</i> : SMT 2a <i>Pedofeatures</i> : Amorphous: many fine strong and abundant moderate iron impregnation of amorphous OM and plant tissues. Fabric: occasional thin (400µm) burrows and chambers. Excrements: occasional very thin (50µm) organic excrements	269 upper: Uppermost 5mm of dark reddish brown layered humified peat (15.9% LOI, amorphous organic matter and layered plant fragments), with small biochannels containing very thin organic excrements
MFT E2 SMT 5b and 5c		9.5–15cm: Moderately heterogeneous <i>Microstructure</i> : fine angular blocky (massive, burrowed, channel), 35% voids, fine (<1 mm) angular curved planar voids and fine (1–2mm) chambers and fine channels; Coarse Mineral: C:F, 25:75, well sorted silt to medium sand-size quartz <i>Coarse Organic and Anthropogenic</i> : rare root remains, <i>in situ</i> and in fragments abundant fine humified plant fragments and fine charred and amorphous OM <i>Fine Fabric</i> : SMT 5b and SMT 5c, as humic and poorly humic variants of SMT 5a (grano-striate examples) <i>Pedofeatures</i> : Crystalline: rare traces of gypsum. Amorphous: rare traces of pyrite; occasional iron impregnation. Fabric: very abundant broad (2mm) burrows. Excrements: rare thin (<500µm) organic excrements	269 lower: Heterogeneous humic and poorly humic clays (with silt and very few sand), showing un-oriented blackened, humified and charred organic matter inclusions, with burrows and channels, and angular blocky structures; iron staining (and trace amounts of pyrite and gypsum) <i>Ripened peaty clay-humic clay, burrowed and rooted, with formation of pedological structures (angular blocks) – lowering of water table; original oriented organic content was homogenised (cf horizontal oriented detrital OM in unworked peaty clays of 268); renewed rise in water table and laminated peat formation – affected by minor ripening (chamber fills of organic excrements), prior to flooding and renewed alluviation (268)</i>
		BD 269: 15.9% LOI, 0.978 mg g ⁻¹ Phosphate-P, 7.40 x 10 ⁻⁸ SI % 0.836% χ _{conv} , BD 270: 4.32% LOI, 0.690 mg g ⁻¹ Phosphate-P, 12.7 x 10 ⁻⁸ SI % 1.51% χ _{conv} ,	270: bulk data suggests probable humic clays, similar to lower part of 269

BH3748 Thames Crossing Swanscombe

Microfacies type (MFT) and Soil microfabric type (SMT)	Thin section	Depth (from top of core) and Soil micromorphology (SM)	Interpretation and Comments
MFT D8 SMT 2c over MFT D7 SMT 4b2	3748A	24–32cm: SM: as below (with fewer [occasional] roots and many iron impregnations), becoming more organic (horizontally oriented plant fragments and long [5mm] plant fragments in dominantly organic laminae at 26cm SMT 2c: pale brown, horizontal oriental plant-dominated (PPL), moderately low interference colours (very open porphyric, plant-associated pseudo-unistrial b-fabric, XPL), brown to darkish brown (OIL); very abundant plat tissues	Horizontally layered monocotyledonous plant fragments, with humic clayey matrix and very sparse silt, over (sharp boundary) laminated humic clays with detrital organic matter content (as below) <i>Laminated in situ-formed peat over probable low energy mudflat deposits. (No evidence of sediment ripening/soil formation)</i>
MFT D7 SMT 4b2	3748B	32–40cm: Homogeneous <i>Microstructure:</i> massive with relict fine (1–2mm) laminae; 30% fine to very coarse (1–6mm) channels <i>Coarse mineral:</i> C:F, 10:90, well sorted coarse silt with very few fine sand-size quartz <i>Coarse organic and anthropogenic:</i> very abundant medium to coarse flattened horizontal and vertical (browned & blackened) roots & traces; very abundant sub-horizontally oriented monocotyledonous plant fragments and amorphous organic matter; trace amounts of very fine charcoal <i>Fine Fabric:</i> SMT 4b2: heavily speckled dark yellowish brown (PPL), moderately high interference colours (very open porphyric, speckled and pseudo-unistrial b-fabric (root and plant fragment-associated), XPL), darkish brown (OIL); patchy humic staining many to abundant amorphous OM and tissue fragments <i>Pedofeatures:</i> Textural: many intercalations, some associated with relict rooting/root traces. Fabric: many areas of slickensides/preferred orientation (associated with rooting?). Crystalline: occasional gypsum crystals throughout, rare carbonate void infills Amorphous: rare weak iron impregnations	Laminated (1–2 mm) humic clays with sparse coarse silt and generally horizontally oriented very abundant detrital plant fragments, with very abundant coarse roots producing sediment disruption and working; minor iron staining, probable carbonate concentrations, with occasional fine gypsum crystal formation throughout <i>Very low energy humic clays with silt, which are finer and better sorted compared to peaty silts at Thames Crossing coffer excavation at Swanscombe (M17A-B, M21A-C), consistent with mudflat deposition</i>

3880TT Thames Crossing Swanscombe

Microfacies type (MFT) and Soil microfabric type (SMT)	Thin section	Depth (from top of monolith) and Soil micromorphology (SM)	Interpretation and Comments
MFT D3 SMT 4c	M17A	42–50cm: SM as upper M17B/SMT 4b <i>Microstructure:</i> massive and channel; 45% voids, very coarse (10mm) vertical channels; simple packing voids <i>Coarse organic and anthropogenic:</i> very abundant very coarse fleshy roots; rare traces of charcoal <i>Fine fabric:</i> SMT 4c, as SMT 4a, with very abundant fine amorphous organic matter and tissues <i>Pedofeatures:</i> as upper M17B. Textural: occasional silt in-fillings of root channels. Crystalline: abundant thick (1–2mm) calcium carbonate hypocoatings affecting vertical root channels. Fabric: very abundant mixing and slickenside/preferred orientation – from rooting	388004/6: Very humic poorly sorted coarse silt and fine sand, with very abundant coarse roots and root fragments, with strong fabric mixing and disturbance by roots and marked secondary carbonate hypocoating formation; trace amounts of charcoal present <i>Successive rooting and root mixing/disturbance of wet soil/sediments, with calcareous substrate leading to much secondary carbonate nodular formation along root channels – fluctuating water tables</i>

3880TT Thames Crossing Swanscombe continued

Microfacies type (MFT) and Soil microfabric type (SMT)	Thin section	Depth (from top of monolith) and Soil micromorphology (SM)	Interpretation and Comments
MFT D2 SMT 4b	M17B	50–54cm: Heterogeneous <i>Microstructure</i> : massive with relict broad bedding; compact – 5%, with 20% very to very coarse (7mm) channels <i>Coarse mineral</i> : C:F, 90:10, poorly sorted coarse silt to medium sand (and gravel size flint), as SMT 1, but with angular feldspar <i>Coarse organic and anthropogenic</i> : many medium to coarse flattened horizontal and vertical roots and traces; many burnt (calcinced and rubefied) angular flint (3+ - max 24mm); rare trace of fine charcoal <i>Fine Fabric</i> : SMT 4b, as SMT 1, but with grano- and parallel striate b-fabrics in places <i>Pedofeatures</i> : Textural: many intercalations, some associated with relict rooting/root traces Fabric: many areas of slickensides/preferred orientation (associated with rooting?) Crystalline: rare traces of coarse dense CaCO ₃ nodular formation and gypsum crystals Semi-horizontal boundary	388006: Massive poorly mixed humic silt and medium sand, containing many very coarse burnt flint, and trace of charcoal; all affected by abundant semi-aquatic plant(?) rooting, many intercalations, preferred orientation and some nodular (calcium?, sodium?) carbonate formation <i>Short-lived weakly biologically worked and weathered poorly sorted silts and medium sands, containing plant fragments; occupied (local burnt rock midden?); inundation and rooting through slaking and collapsing 'soil'</i>
MFT D1 SMT 4a		54–55cm: laminated silts and very fine sand with yellow clay matrix (see Textural Pedofeature, below), silts and silty fine sands 55–57.5cm: Heterogeneous <i>Microstructure</i> : massive/poorly layered(?); 20% voids, fine to medium (0.5–4mm) root channels, fine horizontal planar voids <i>Coarse mineral</i> : C:F, 80:20, very poorly sorted rounded chalk clasts (gravel ~1.0mm) with coarse silt fine sand and sand-size chalk clasts in matrix <i>Coarse organic and anthropogenic</i> : many blackened fine to medium roots (0.5–4mm); <i>Fine Fabric</i> : SMT 4a: cloudy grey (PPL), high interference colours (close porphyric, crystallitic b-fabric, XPL), white (OIL); rare traces of fine amorphous organic matter and tissues <i>Pedofeatures</i> : Textural: many thin to coarse (0.2–1.0mm) yellow poorly oriented limpid clay inwash (see above). Crystalline: rare traces of fine dense CaCO ₃ nodular formation. Amorphous: occasional patches of pyrite framboids associated with roots	388005: 10mm of finely bedded silts and silty clay over weakly bedded chalk gravel in calcareous silt and sand loam, with inwashed yellow clay from base of context 6; rooting and localised pyrite and traces of nodular carbonate (CaCO ₃ , NaCO ₃) formation <i>Soliflual chalky deposit, with declining energy – low energy becoming fluvial/colluvial silts</i>
MFT D6 SMT 4e, 4f1, 4f2	M21A	0–7.5cm: Heterogeneous (common palaeosol SMT 4e [context 388006] and common estuarine silts – SMT 4f [context 388004]); as M21B, with rare to occasional gravel-size (5mm) flint and burnt flint and fine charcoal; SMT 4e as SMT 4e in M21B, with thin humic staining and rare fine charred and blackened organic matter	388004–6 (peat-silty soil interface) <i>Strongly root-mixed boundary between weakly humic palaeosol (context 388006) with occasional burnt flint and fine charcoal, and peaty, carbonate and iron stained context 388004</i>

MFT D6 SMT 4e, 4f1, 4f2	M21B	7.5–15cm Heterogeneous (dominant palaeosol SMT 4e and common estuarine silts – SMT 4f) <i>Microstructure</i> : massive and channel; 5–25%, fine to coarse (1.2mm) root channels <i>Coarse mineral</i> : C:F, SMT 4e, 70:30, SMT 4f, 60:40, SMT 4e, as SMT 4d; SMT 4f moderately well sorted fine to coarse silt <i>Coarse organic and anthropogenic</i> : rare traces of fine charcoal, possible very fine calcined mineral; very abundant fine to very coarse (1.2mm), often woody (lignified cells) roots <i>Fine Fabric</i> : SMT 4e: speckled and dotted pale brown (PPL), low interference colours (close porphyric, speckled and grano-striate b-fabric, XPL), grey (OIL); very thin organic staining, rare traces of blackened (and charred) organic matter; SMT 4f1: speckled and dotted brownish (PPL), low interference colours (close porphyric, speckled b-fabric, XPL), pale brown (OIL); humic staining with occasional fine amorphous and tissue fragments, phytoliths and fungal material present; SMT 4f2 – as SMT 4f1 (relict fleshy root channel fill), strong humic staining, very abundant amorphous organic matter and tissues, occasional fungal material, phytoliths present <i>Pedofeatures</i> : Textural: abundant intercalations and rare associated moderately thick (300µm) very finely dusty and laminated void coatings and infills. Depletion: probable strong iron depletion of matrix. Crystalline: many dense CaCO ₃ (or possibly Na ₂ CO ₃) nodular formation and broad (7mm) void (root channel) hypocoatings. Amorphous: occasional iron root and matrix impregnations. Fabric: very abundant fabric mixing of silt dominated 'soil', with slickenside-like features/preferred orientation of clay	388006: Compact silt-medium sand loam, with strong (woody) root mixing of weakly humic silt and humic silty clay (rich in plant tissues and fungal material – fleshy semi-aquatic rootings? [context 388004]). Compact soil with rare scatter of charcoal and possible fine burnt mineral, localised intercalations and dusty clay void infills; secondary iron and carbonate impregnations associated with roots and relict coarse root channels <i>Weakly humic palaeosol with included rare fine charcoal, undervent inundation and structural collapse and partial elutriation (washing into M21C): some mixing of initial estuarine silts, and ensuing complicated history of probable woody root impact and mixing, followed by fleshy root mixing-in of peat; fluctuating water tables also recorded by calcium carbonate and later iron impregnation (along channels)</i>
MFT D5 SMT 4d	M21C	38.5–43.5cm: Homogeneous (relict bedding) <i>Microstructure</i> : massive with weak channel; 30%, fine to coarse root channels, with fine closed vughs and vesicles; <i>Coarse Mineral</i> : C:F, 70:30, patches of moderately sorted silt-very fine sand, and moderately poorly sorted silt to medium sand <i>Coarse organic and anthropogenic</i> : occasional very fine (<0.5mm) to coarse (5mm) roots; rare traces of possible calcined mineral grains <i>Fine fabric</i> : SMT 4d (similar to SMT 4b, but non-humic), finely speckled pale yellowish brown (PPL), moderately low interference colours (close porphyric, speckled and grano-striate [see intercalations] b-fabric, XPL), grey (OIL); rare traces of fine blackened organic matter <i>Pedofeatures</i> : Textural: very abundant intercalations and associated thick (100–300µm) very finely dusty void coatings and infills. Depletion: probable strong iron depletion of matrix. Crystalline: many dense CaCO ₃ (Na ₂ CO ₃) nodular formation and broad (2–3mm) void (root channel) hypocoatings; rare traces of gypsum at boundary between contexts 388005 and 388006. Amorphous: many iron root and matrix impregnations. Fabric: very abundant fabric mixing of silt dominated 'soil' Irregular boundary	388006: massive, partially mixed silt and medium sandy loams, dominated by textural pedofeatures (intercalations and void infills) of structural collapse and mixing and 'bedding'; secondary features include occasional roots and rare gypsum, and many ferruginous and calcareous (sodic) impregnations with some finely dusty clay void coatings being associated with rooting <i>Non-calcareous solifluction/solifluid poorly bedded silt and medium sandy loam (Head) deposits, as evidence of Late Glacial (possibly Zone III, Loch Lomond Stadial?) slope erosion and deposition – see WHS and Folkestone); down-profile clay movement and slickenside-like fabric features related to rooting and structural collapse higher up (eg. M21B) and in situ lithotropic (water saturated condition); iron and calcium carbonate impregnation linked to Holocene rooting into calcareous gravels below, and ensuing oxygenation (iron movement)</i>
MFT D4 SMT 4a		43.5–46.5cm: as MFT D1, but with rounded coarse ironstone (7mm) and flint (18mm) gravel; relict remains of calcareous SMT 4a – root mixing with overlying SMT 5a <i>Pedofeatures</i> : Crystalline: occasional gypsum laths. Amorphous: occasional iron impregnation and void hypocoatings <i>Solifluid gravel (coarse Head deposits)</i>	388005: ironstone and flint gravel-rich bed, with traces of original calcareous matrix mixed with silty clay from above; gypsum and root traces present <i>Solifluid gravel (coarse Head deposits)</i>

Bulk analysis

Wennington Marsh	Context	LOI (%)	Phosphate-P_i (mg g⁻¹)	Phosphate-P_o (mg g⁻¹)	Phosphate-P (mg g⁻¹)	Phosphate-P_i:P (%)	Phosphate-P_o:P (%)	χ (10⁻⁸ SI)	χ_{\max} (10⁻⁸ SI)	χ_{conv} (%)
26.535km	234	3.85	0.554	0.212	0.766	72.3	27.7	14.6	617	2.37
	235	3.30	0.621	0.189	0.810	76.7	23.3	14.6	847	1.72
27.460km	269	15.9	0.667	0.311	0.978	68.2	31.8	7.40	885	0.836
	270	4.32	0.493	0.197	0.690	71.4	28.6	12.7	842	1.51

Appendix C

Tables

Table 8 Route corridor Windows and Zone descriptors

Window	Chainages (km)	Zones	Zone distances (km)	Description	Priority
6	17.3–18.92	T1	17.3–17.66	This zone is characterised by thin alluvial sequences of Holocene clay-silts and peats overlying the Pleistocene gravels at datums of <i>c</i> -1.5m OD	Medium
		T2	17.66–18.04	This zone is characterised by a steep descent in the rockhead datums from <i>c</i> -5.0m OD to <i>c</i> -9.0m OD and a corresponding, although less marked, decrease in the elevation of the upper surface of the Pleistocene sands and gravels. Holocene sediments consist of peat immediately overlying the Pleistocene sediments and a thin sequence of clay-silts above the peat. Holocene sediments are thicker than that within Zone T1	Low
		T3	18.04–19.06	This zone, which extends into Window 7, is characterised by rockhead datums of -9.0m OD with the upper surface of the Pleistocene deposits typically resting at -4.0m OD. Holocene sediments consist of thick sequences of peats, above a thin minerogenic basal unit, and a thick cover of clay-silts. Only at 18.287km does a second peat appear in the sequence. Some lateral variability in sequence type is noted particularly where organic silts replace peats at about 18.6km	Low
7	18.92–21.40	T3	18.04–19.06	As above	Low
		T4	19.06–19.83	This zone contains Pleistocene gravels resting on bedrock between -9.0m and -10.0m OD, with upper surface datums for the gravels between -4.5m and -6.0m OD. The upper surface of the gravels undulates with a major topographic low (possibly marking the position of a former floodplain channel tributary) at 19.325km. A major peat unit extends across this zone between -0.5m and -4.0m OD. Upper and lower contacts appear to dip gently from west to east along route corridor. Thin basal minerogenic deposits exist below the peat with coarser grained elements (including gravels and silts) in association with the low described at 19.325km (strengthening arguments suggesting this may represent the course of a floodplain tributary)	Low
		T5	19.83–19.94	This zone is defined by the sharp rise in the upper surface of the Pleistocene gravels from -6.0m OD to -3.5m OD. Peats exist immediately above the gravel surface here. The rockhead datum shows no comparable rise	Medium
		T6	19.94–20.75	Rockhead datums lie below -10.0m OD. The upper surface of the gravels dips gently eastwards from <i>c</i> -3.5m OD to in excess of -4.0m OD. Peat units, comparable in elevation to those in Zone 5, exist and dip towards the east following the underlying gravel contours. Thin clay-silt and sand units underlie the peat. Typically made ground extends from the ground surface to the top of the peat through much of this area	Low
		T7	20.75–21.65	This zone shows a dip in rockhead datums from -10.5m OD to -12.0m OD. A similar dip is noted in the gravel surface. Peat units exist in the western part of this zone but are replaced eastwards by organic silts. Sediments underlying the peat consist of sands or clay-silts	Low
8	21.40–24.39	T7	20.75–21.65	As above	Low
		T8	21.65–22.06	Rockhead datums lie at -10.0m OD with the upper gravel contact at <i>c</i> -4m OD. Internal variation is noted within the gravel where sand bodies exist within the gravel at 22km. This may indicate the presence of a major relict channel within the sequence. A thin peat/organic silt directly overlies the gravels. Thick sequences of made ground exist at this point in the route corridor	Low

Table 8 Continued

Window	Chainages (km)	Zones	Zone distances (km)	Description	Priority
		T9	22.06–22.73	Rockhead datums vary through this zone from -13.0m OD to -11.0m OD. The upper surface of the Pleistocene deposits undulate and fluctuate between -6.0m OD and -4.0m OD. Considerable internal variation in grain size of sediments exists within the gravel body. This may indicate channel activity within the depositional episode responsible for gravel sequence accumulation. Holocene sediments consist of a major peat unit between -2.0m OD and -4.0m OD. The peat is underlain by organic silts and clays. Organic silts and clays overlie the peat. Made ground exists along the length of the route corridor	Low
		T10	22.73–23.03	Rockhead datums lie at about -11.0m OD. The upper surface of the gravel extends to <i>c</i> -3.0m OD. Considerable grain size variation exists within the sand and gravel body. Holocene peats immediately overlie the Pleistocene deposits at about 22.9km. At this point two peat units are noted to exist, extending upwards to datums of <i>c</i> 1.5m OD	Low
		T11	23.03–23.46	Rockhead datums obtain maximum depths of -14.0m OD in this area. The upper surface of the gravels outcrops at <i>c</i> -5.0m OD. Holocene sediments consist of silts overlain by peats, capped by clay-silts	Low
		T12	23.46–24.13	This zone corresponds with the Rainham Wharf area. Rockhead datums vary from -14.0m OD to -6.0m OD at the eastern end of the route corridor. Marked variation in the elevation of the upper surface of the gravels is also noted with rapidly changing topographic variation at 23.8km and 24km. These gravels thin rapidly to the east	High
		T13	24.13–24.73	Rockhead datums are unknown for this zone as boreholes only penetrated the upper surface of the Pleistocene sequences. The base of the Holocene sequences lies at -7.0m OD within this zone. Holocene sediments consist of a thin sequence of sand, silts and clays overlain by a thin peat unit at <i>c</i> -6.0m OD. A major peat unit exists at the eastern end of this zone, but to the west only clay-silts exist	Low
9	24.39–27.78	T13	24.13–24.73	As above	Low
		T14	24.73–26.05	Within this zone rockhead datums dip from -10.0m OD to -14.0m OD. The upper surface of the Pleistocene deposits undulate and show considerable topographic variation from -5.0m OD to -8.5m OD and attain maximum elevations at 25.750km. Holocene sediments consist of a major peat unit between -2.0m OD and <i>c</i> -5.0m OD. In places this peat subdivides into three units. A basal organic unit resting at <i>c</i> -7.0m OD exists at the eastern end of the zone resting directly on the Pleistocene surface. Clay-silts and silts with some organic material both overlie and underlie these peat units	Low
		T15	26.05–28.00	Rockhead datums within this zone are typically between -13.0m OD and -17.0m OD. The upper surface of the gravels lies below -10.0m OD. Peat units within this area lie between -2.0m OD and -5.0m OD and overlie a thick sequence of organic and inorganic silts across much of the zone. Thick sand sequences are noted at the 26.5km mark. These sands may mark the position of an active channel within the floodplain through much of the Holocene. Inorganic silts cap the sequence	Low
10	27.78–28.93	T15	26.05–28.00	As above	Low
		T16	28.00–28.20	Rockhead datums rest at <i>c</i> -5.0m OD. The rockhead is overlain by sediments interpreted in the borehole logs as Head units. Head deposits lie below approximately 4m of sand and gravel with an upper contact with the overlying made ground at <i>c</i> 1.0m OD. These deposits are thought to be floodplain remnants of older Pleistocene sediments isolated as 'islands' within the floodplain. No Holocene sediments exist within this zone	High
		T17	28.20–28.93	Rockhead datums within this zone dip from -5.0m OD to -10.0m OD at 28.6km before rising steeply to -2.0m OD at the eastern end. This surface is overlain by a complex of different sediments varying described as Head deposits, gravels and sands. These deposits are considered to represent a complex of probable Late Pleistocene periglacial solifluction deposits and interbedded fluvial sequences. The Pleistocene sediments are overlain by Holocene deposits probably infilling the valley of the Mar Dyke. Complex lateral variation in facies is to be expected where the Mar Dyke was discharging into the Thames system. This complexity is revealed in the cross profile	Medium

Table 8 Continued

Window	Chainages (km)	Zones	Zone distances (km)	Description	Priority
11	30.50–33.15	T18	30.50–31.00	Rockhead datums dip steeply from north to south in this zone dipping from 9.0m OD to -13.0m OD. Pleistocene gravels overlying bedrock only occur in two locations to the north between datums of 2.0m OD and 4.0m OD around 30.6km and at the southern end of the zone between -13.0m OD and -8.0m OD. Holocene sediments are noted to be present thinning and disappearing northwards against the rising chalk bedrock. Two peat units are present that consist of a basal peat at -8.0m OD overlying the basal gravels and a thicker, higher peat between -1.0m OD and -5.0m OD clay-silt units occur above and below the main (upper) peat unit	High
		T19	31.00–31.50	Rockhead datums lie at about -15.0m OD and the upper surface of the gravels rests at -9.0m OD. Holocene clay silts with organic inclusions overlie the gravel. Thick sequences of made ground cap the sequence. Made ground may have removed any traces of peat in this area	Low
		T20	31.50–32.25	Within this zone rockhead contours descend to c -16.0m OD. This reflects a similar dip to the upper surface of the Pleistocene deposits. These deposits contain substantial thicknesses of sand possibly indicative of a former, sand filled, channel through the floodplain. Holocene sediments overlie the basal gravels between -9.0m OD and -10.0m OD. Two peat complexes are present within the Holocene stack. The lower complex typically lies between -8.0m OD and -9.0m OD. These peats overlie thin organic silt units. The uppermost peat is of considerable thickness and lies between -1.0m OD and -5.0m OD. Organic silts are present between the two peat units. Made ground rests directly on the surface of the upper peat in most cases	Medium
		T21	32.25–32.85	Rockhead datums lie at about -16.0m OD and the upper surface of the gravels exist at -9.0m OD. Holocene clay silts with organic inclusions overlie the gravel. The lowermost peat seen in Zone T20 is only present at the northern end of this zone. The upper peat seen in Zone T20 peat is of considerable thickness and lies between -1.0m OD and -5.0m OD. Thick sequences of made ground cap the sequence	Low
		T22	32.85–33.25	Rockhead datums vary between -17.0m OD and -15.0m OD. This trend is mirrored by a similar rise in the upper surface of the gravels where elevations between -11.0m OD and -10.0m OD are attained. Holocene sediments overlie the basal gravels and two peat complexes are present within the Holocene stack. The lower complex typically lies between -9.0m OD and -10.0m OD. These peats overlie thin organic silt units or rest directly on the underlying gravels. The uppermost peat is of considerable thickness and lies between -1.0m OD and -7.0m OD. In places this peat may be divided into various sub-units. Organic silts are present between the two peat units. Made ground exists through much of this zone	Medium
		T23	33.25–34.10	This zone corresponds with the modern position of the Thames channel. Rockhead datums vary between -17.0m OD and -15.0m OD. Similar trends in the elevation of the upper surface of the gravels have been noted. Some variation in the nature of the gravel sequences is noted to the south of the main channel. At 34.0km organic sediments have been noted within the gravels. Within this zone beneath the modern Thames channel, it is likely that sequence truncation has taken place. Holocene sediments can be seen to thin rapidly towards the modern channel. Holocene sediments are similar to those in zones landward of the main channel	Low
12	33.15–36.30	T23	33.25–34.10	As above	Low
		T24	34.10–34.95	Rockhead datums vary between -16.0m OD and -18.5m OD in this zone. The upper surface of the Pleistocene sequence also undulates, varying between -14.0m OD and -9.5m OD. The Pleistocene sediments are highly variable with chalk gravels infilling a possible incised channel at the base of the sequence and sands and gravels making up the majority of the sediment body. Evidence exists for a possible sand filled channel within the upper part of the gravel sequence (an alternative interpretation would suggest this represents a channel cut into the gravels and dates to a younger phase). Holocene sediments consist of two peat units interstratified with organic silts. Thick made ground sequences are present here	Medium
		T25	34.95–35.23	Within this zone rockhead datums lie at about -15.0m OD. The upper surface of the Pleistocene sequence lies at about -7.5m OD. A major sand body appears as part of this aggradation and may infill a channel within or cut into the gravels. Holocene sediments consist of up to two peats interbedded with organic silts. Made ground is minimal within this zone	Medium

Table 8 Continued

Window	Chainages (km)	Zones	Zone distances (km)	Description	Priority
		T26	35.23–35.28	This zone contains a small outcrop of gravel resting on a rockhead surface at -7.5m OD and exhibiting an upper surface datum of -4.5m OD. This gravel clearly forms a remnant gravel body at a very different elevation to those elsewhere within the transect. Holocene sediments consist of peat and organic silts. No made ground is present here	High
		T27	35.28–35.65	This zone consists of a rockhead surface at or above 0.0m OD. No Pleistocene gravel is recorded here and fill immediately overlies made ground	High
13	35.90–37.55	E1	35.90–36.70	This zone coincides with the valley margin situation on the western side of the Ebbsfleet Valley. Previous work in this area (Oxford Archaeological Unit 1997) has illustrated the broad nature of the stratigraphic sequence through this part of the route corridor. However some uncertainty regarding the precise location of the boundary between the valley sides and alluvium exists. In particular the interface between the Pleistocene sediments, forming a complex of last interglacial and last glacial deposits (Boreholes 0018SA–0021SA), and the Holocene wedge thinning from the west towards the sports pavilion remains difficult to evaluate. Edge marginal situations to the south, adjacent to the Roman building, have been shown to contain complex archaeological remains. Furthermore prehistoric ecotonal zones may contain archaeological artefacts	Medium
		E2	North Kent Link Line	This zone defines a cross-valley profile through the main stratigraphic units identified from borehole and test pit records. The Holocene valley bottom consists of sands and gravels forming a raised area to the west and a deeper 'basin-like' area to the east. A peat complex forms the main sediment body resting between two clay-silt units. The peat consists of a basal woody peat and an upper reed peat that rises and thins to the west over the gravel high. The organic sediments are unusual in that they contain both plant remains and molluscs in places. The archaeological potential of these deposits has previously been described and both Mesolithic and Neolithic remains have been located within this zone (Oxford Archaeological Unit 1997)	High
		E3	37.30–37.55	This zone contains the main line crossing of the Ebbsfleet river downstream of the Roman town of Springhead. Sediments within this stretch of the valley are poorly understood although previous work has indicated that important waterlogged sediments of Neolithic age are present within the area (Burchell 1938; Burchell and Piggot 1939)	High

Table 13 Temple Mills sedimentary descriptions from monoliths analysed in Trenches 4042TT and 4044TT

Height (m OD)	Context	Description
3.65–3.22	420001	10YR 5/2 greyish brown smooth amorphous gleyed clay. Substantial coarse mottling with iron (7.5YR 5/6 strong brown) and iron redeposition in root voids. <i>Oxidised alluvial clay: the movement of iron through the profile indicates terrestrialisation of waterlogged deposits.</i> Diffuse boundary to lesser iron redeposition below
3.22–2.77	420002	10YR 5/2 greyish brown smooth amorphous gleyed clay. Some mottling with iron (7.5YR 5/6 strong brown). <i>Alluvial clay.</i> Gradual transition to:
2.77–2.65	420003	10YR 2/2 very dark brown peaty clay, clay content increasing to top. Gradual transition to:
2.65–1.78		2.65–2.57m OD: 10YR 2/3 very dark brown humified silty clay peat. <i>Phragmites australis</i> (common reed) stem common. 2.62m OD: <i>Phragmites</i> stem dated to *3520–3330 cal BC (4610±35BP, KIA-24052). Diffuse boundary to: 2.57–2.47m OD: 10YR 2/3 very dark brown peaty clay. No discernible inclusions or structure. Clear boundary to: 2.4–2.34m OD: 10YR 3/2 very dark greyish brown silty peat (silt increasing up the unit). Contains wood fragments (less than underlying unit), 2.49m OD twig fragments dated to *3500–3120 Cal BC (4589±30BP, NZA-30301). Diffuse boundary to: 2.34–1.92m OD: 10YR 2/2 very dark brown woody peat, reduced silt and clay content than underlying stratum, 2.29m OD wood dated to 8220–7830 cal BC (8865±30BP, NZA-30332). 1.92–1.78m OD: 10YR 3/3 dark brown woody silty clay peat. Clear horizontal layers of plant material, notably <i>Phragmites</i> . 1.84m OD: <i>Phragmites</i> stem dated to 10,800–9800 cal BC (10,305±40BP, KIA-24051). <i>Woody fen peat and peaty clays.</i> Diffuse boundary to:
1.78–1.60	420004	1.78–1.75m OD: 5Y 4/3 olive calcareous silt with very fine horizontal bedding. Mollusc rich, no other visible inclusions. 1.75–1.66m OD: 5Y 4/2 olive grey silty clay streaked with black organic matter. Mollusc rich, rare (<1%) angular flint gravel 1cm and twig wood at 1.93m OD. Vertical root marks filled with overlying peat material. Seemingly from plants growing on lower peat when it was an exposed surface, no evidence of deep modern root penetration. Gradual boundary to: 7.5YR 3/2 (N3/) very dark grey 75% rounded gravel (0.1–0.5cm +5cm) in coarse sandy humic clay. <i>Fluvial sands and gravels</i>
3.44–3.27	440001	10YR 5/6 yellowish brown amorphous stiff sticky silty clay with coarse black mottles (including a 5mm black band at 3.31m OD) which include rare fragments of possible coke. <i>Disturbed alluvium/made ground.</i> Clear wavy slanting boundary to:
3.27–2.74	440002	3.27–2.99m OD: 10YR 5/3 brown silty clay alluvium with laminations and lenses of black organic clay silt (7.5YR 2/0 black (N2/)). Occasional mollusc shells, monocot stems including possible straw. Charred seed <i>Nuphar/Nymphaea</i> at 3.22m OD. Thin band of 10YR 5/8 yellowish brown slightly crumbly clay silt at 2.97–2.96m OD. <i>Alluvium and organic alluvium.</i> Gradual-diffuse boundary to: 2.99–2.74m OD: 10YR 4/3 brown/dark brown massive slightly fibrous and organic greasy silty clay. Occasional fine humified vertical and horizontal fine stems and rootlets. <i>Alluvium.</i> Sharp (erosional?) boundary:
2.74–2.68	440003	2.73m OD: 3 outer rings mature wood dated to 2140–1910 cal BC (3650±35BP, KIA-24588). 2.74–2.72m OD: band of woody peat as below (unit D1) clear-abrupt boundary. 2.72–2.69m OD: 10 YR 5/4 yellowish brown organic silty sand with molluscs, including operculum of <i>Bithynia tentaculata</i> , whole hinged bivalve (<i>Spherium</i> sp.) and <i>Trichia</i> sp. Sand white, medium-coarse. Contained 30mm degraded branch wood and a 40mm fire cracked flint (both in direct contact with the overlying peat). <i>Old land surface on fluvial sands.</i> Clear boundary to:
2.68–2.37	440004	2.69–2.47m OD: 10YR2/1 black highly humified silty clay peat. Minerogenic component increasing to top, becoming peaty silty clay in top 20mm. Occasional molluscs include large <i>Cepaea</i> sp. at 2.57m OD. Large wood fragment, 130mm diameter (including bark to heartwood) crossing nearly whole width and depth of monolith from 2.57–2.43m OD. 2.68m OD, horizontal root dated to 2200–1950 cal BC (3690±35BP, KIA-24589). Gradual boundary to: 2.46–2.37m OD: 10YR 2/1 black peaty silty clay with numerous molluscan remains and occasional wood and root fragments. 2.39m OD, two fragments of twig dated to 2580–2400 cal BC (3980±30BP, KIA-24590). <i>Peat and peaty alluvium.</i> Gradual boundary to:
2.37–2.26		2.37–2.29m OD: 10YR 4/3 brown/dark brown silty clay thinly bedded/laminated with black organic bands. Rare wood fragments, abundant molluscs. <i>Alluvium.</i> Clear boundary to:
2.29–2.26	440005	2.29–2.26m OD: 10YR 7/2 light grey, white medium-coarse sand band in organic silt with molluscs. <i>Alluvium/fluvial sands.</i> Clear boundary to:
2.26–2.19	440006	10YR 2/1 black sandy woody peat, slightly loose and degraded/humified. Wood fragments common, large humified <i>in situ</i> woody root. 2.22m OD, two fragments of twig wood dated to 3340–2920 cal BC (4435±40BP, KIA-24591). <i>Peat</i>

* Dates suspected as being erroneous (too young)

Table 14 Insect remains from Temple Mills Trenches 4042TT and 4044TT

		Context	420004	440005
		Sample number	421003B	441022B
		Volume of sediment (litres)	5	5
		Ecological codes		
COLEOPTERA				
Carabidae	<i>Dyschirus globosus</i> (Hbst.)		-	2
	<i>Bembidion doris</i> (Panz.)		-	1
	<i>B. guttula</i> (F.)		1	-
	<i>Bembidion</i> spp.		2	-
	<i>Pterostichus</i> spp.		1	1
	<i>Calathus fuscipes</i> (Goeze)		1	-
Halididae	<i>Haliplus</i> spp.	a	2	-
Dytiscidae	<i>Hygrotus decoratus</i> (Gyll.)	a	2	-
	<i>Hydrophorus</i> spp.	a	1	-
	<i>Stictotarsus duodecimpustulatus</i> (F.)	aff	2	-
	<i>Acilius</i> pp.	a	1	-
Gyrinidae	<i>Gyrinus</i> spp.	a	1	-
Hydraenidae	<i>Hydraenariparia</i> Kug.	aff	1	5
	<i>Hydreana</i> spp.	a	9	-
	<i>Ochthebius minimus</i> (F.)	a	1	-
	<i>Ochthebius</i> spp.	a	8	6
	<i>Helophorus</i> spp.	a	8	-
Hydrophilidae	<i>Cercyon tristis</i> (Ill.)	a	-	2
	<i>Megasternum boletophagum</i> (Marsh.)	df	-	2
	<i>Hydrobius fusipes</i> (L.)		3	-
	<i>Enochrus</i> spp.	a	3	-
Liodidae	<i>Agathidium</i> spp.		1	-
Ptiliidae	Ptilidae Genus & spp. indet.		-	2
	<i>Acrotrichis</i> spp.		-	3
Staphylinidae	<i>Olophrum</i> spp.	ws	2	-
	<i>Lesteva</i> spp.	ws	2	3
	<i>Trogophloeus</i> spp.		1	-
	<i>Oxytelus rugosus</i> (F.)	df	-	2
	<i>Platystethus cornutus</i> (Grav.)	ws	1	-
	<i>Stenus</i> spp.		1	2
	<i>Stilicus</i> spp.		-	1
	<i>Lathrobium</i> spp.	ws	1	1
	<i>Philonthus</i> spp.		2	-
	<i>Tachyporus</i> spp.		2	-
	Aleocharinidae Genus & spp. indet.		5	-
Cantharidae	<i>Cantharis</i> sp.		1	-
Dryopidae	<i>Dryops</i> spp.	a	-	1
	<i>Esolus parallelepipedus</i> (Müll.)	aff	1	-
	<i>Oulimnius</i> spp.	aff	-	4
	<i>Macronychus quadrituberculatus</i> Müll	aff	-	2
Nitidulidae	<i>Meligethes</i> spp.		1	-
Rhizophagidae	<i>Rhizophagus</i> spp.		-	1
Lathridiidae	<i>Corticaria/corticarina</i> spp.		1	-
Mordellidae	<i>Anaspis</i> spp.		1	-
Chrysomelidae	<i>Donacia vulgaris</i> Zschach	ws	2	-
	<i>Plateumaris braccata</i> (Scop.)	ws	-	1
	<i>Prasocuris phellandri</i> (L.)	ws	1	-
	<i>Lochmaea suturalis</i> (Thoms.)	m	2	-
	<i>Phyllotreta</i> spp.		2	1
	<i>Haltica</i> spp.	p	2	-
Scolytidae	<i>Hylesinus crenatus</i> (F.)	t	-	1
Cuculionidae	<i>Phyllobius</i> sp.	p	1	-
	<i>Phleoephagus lignarius</i> (Marsh.)	t	-	1
	<i>Bagous</i> spp.	ws	1	-
	<i>Notaris</i> spp.	ws	1	-
	<i>Ceutorhynchus</i> spp.	p	1	-
Total number of individuals			83	45
Total number of species			41	22
% aquatic (a)			43.4	20.0
% aquatic fast flowing (aff)			4.8	24.4
% waterside (ws)			13.3	11.1
% rotting foul/terrestrial (df)			0.0	20.0
% tree/terrestrial (t)			0.0	10.0
% moorland/terrestrial (m)			6.3	0.0
% grassland and pasture/terrestrial (p)			12.5	0.0

Table 15 Waterlogged plant remains from Temple Mills

	Trench	4042	4044
	Lithology	Shelly silt	Sand within peat
	m OD	1.78–1.66	2.26–2.29
	Context	420004	440005
	Sample	441003	441022
Taxa	Common name		
<i>Chara</i> sp. (gametes)	stonewort	+++	-
Musci (fragments)	moss	++	-
<i>Nymphaea alba</i>	white water-lily	-	2
<i>Ceratophyllum demersum</i>	rigid hornwort	17	-
<i>Ranunculus</i> subg. <i>arb</i>	buttercup	-	2
<i>Ranunculus</i> subg. <i>Batrachium</i>	water-crowfoot	3	1
<i>Thalictrum</i> cf <i>minus/flavum</i>	meadow-rue	1	-
<i>Betula</i> cf <i>nana</i> (seed)	dwarf birch	1	-
<i>Alnus glutinosa</i> (catkins)	alder catkins	-	10
<i>Alnus glutinosa</i> (cones)	cones	-	11
<i>Alnus glutinosa</i> (fruit)	alder seeds	-	15
<i>Alnus incana</i> (seed)	alder fruit	1	-
<i>Rumex</i> sp.	dock	1	-
<i>Filipendula ulmaria</i>	meadow sweet	1	-
<i>Crataegus monogyna</i> (stone)	hawthorn	-	1 gnawed
<i>Myriophyllum</i> cf <i>verticillatum/spicatum</i>	water-milfoil	21	-
<i>Lycopus europaeus</i>	gypsywort	-	1
<i>Mentha</i> cf <i>arvensis</i>	corn mint	-	1
<i>Mentha</i> cf <i>aquatica</i>	water mint	-	1
<i>Sambucus nigra</i>	elder	-	1
<i>Valeriana dioica</i>	marsh valerian	5	-
<i>Cirsium/Carduus</i> sp.	thistle/knapweed	5	-
<i>Baldellia ranunculoides</i> ssp. <i>ranunculoides</i>	lesser water plantain	cf. 1	-
<i>Alisma plantago-aquatica</i>	water-plantain	2	-
<i>Potamogeton</i> sp. (<2mm)	pondweed	48	-
<i>Potamogeton</i> sp. (>2mm)	pondweed	13	-
<i>Potamogeton</i> cf <i>natans</i>	pondweed	21	-
<i>Potamogeton</i> sp. (c. 2mm)	pondweed	14	-
<i>Carex</i> sp. (seed)	sedge	19	-
<i>Schoenoplectus lacustris/tabernaemontani</i>	common/grey club rush	31	-
<i>Sparganium erectum</i> inner kernels	Branched bur-reed	-	cf 5
cf <i>Carex sylvatica</i> type	wood sedge	-	1
Twigs and branch wood		-	+++

+ 5–25 ++ 25–50 +++ 50–100

Table 16 Ostracods from Temple Mills, 4042TT

Context	420003	420004				
	m OD 2.77–1.78	1.78–1.76	1.76–1.741	1.74–1.72	1.72–1.70	1.70–1.68
* <i>Candona candida</i>		x	xx	xx	xx	xx
<i>Cyclocypris ovum</i> (RV>LV)		x	x	x	x	x
* <i>Pseudocandona</i> cf <i>rostrata</i>		o	x	x	x	x
<i>Ilyocypris</i> sp.		o	x	x	o	o
<i>Candona neglecta</i>			x	x	x	x
* <i>Fabaeformiscandona protzi</i>			x	x	o	
<i>Herpetocypris</i> sp.			o	x	o	x
<i>Eucypris pigra</i>			o			o
Ecology	fen	weedy cold/cool permanent pool				

* cold stenothermal forms (species linked to permanently cold water) o – one specimen x – present (several specimens) xx – common

Table 17 Molluscs from Temple Mills

	Trench	4042TT	4044TT
	Lithology	Shelly silt	Sand within peat
	Context	420004	440005
	Sample	421003	441022
	Volume of sediment (litres)	30	2
LAND			
<i>Carychium minimum</i> Müller		-	3
<i>Carychium tridentatum</i> (Risso)		-	1
<i>Carychium</i> spp.		-	4
<i>Succinea oblonga</i> (Draparnaud)		1	5
<i>Cochlicopa</i> spp.		-	1
<i>Pupilla muscorum</i> (Linnaeus)		4	-
<i>Discus rotundatus</i> (Müller)		-	3
<i>Aegopinella nitidula</i> (Draparnaud)		-	5
<i>Trichia hispida</i> (Linnaeus)		-	1
<i>Cepaea/Arianta</i> spp.		-	2
FRESH- /BRACKISH-WATER			
<i>Theodoxus fluviatilis</i> (Linnaeus)		-	15
<i>Valvata cristata</i> Müller		1	122
<i>Valvata piscinalis</i> (Müller)		655	455
<i>Bithynia tentaculata</i> (Linnaeus)		4	79
<i>Bithynia leachii</i> (Sheppard)		4	36
<i>Bithynia</i> spp.		7	202
<i>Bithynia operculum</i>		196	89
<i>Lymnaea truncatula</i> (Müller)		2	4
<i>Lymnaea peregra</i> (Müller)		2	2
<i>Lymnaea</i> spp.		10	18
<i>Planorbis planorbis</i> (Linnaeus)		-	1
<i>Planorbis carinatus</i> (Müller)		2	-
<i>Anisus leucostoma</i> (Millet)		-	48
<i>Anisus vortex</i> (Linnaeus)		-	3
<i>Gyraulus laevis</i> (Alder)		451	-
<i>Gyraulus albus</i> (Müller)		17	72
<i>Gyraulus crista</i> (Linnaeus)		157	103
<i>Hippeutis complanatus</i> (Linnaeus)		2	-
Planorbids		66	-
<i>Ancylus fluviatilis</i> (Müller)		-	20
<i>Acroloxus lacustris</i> (Linnaeus)		-	4
<i>Pisidium ammicum</i> (Müller)		-	1
<i>Pisidium</i> cf <i>casertanum</i> (Poli)		3	-
<i>Pisidium</i> cf <i>miliun</i> (Held)		3	-
<i>Pisidium</i> cf <i>nitidum</i> (Jeys)		12	16
<i>Pisidium</i> spp.		36	29
Taxa		16	24
TOTAL		1438	1257
Shannon Index		1.345	2.092
Brillouin Index		1.324	2.054
Shannon Index – Brillouin Index		0.021	0.039
Delta 2		0.6571	0.8100
Delta 4		1.9204	4.2800
% Shade-loving species		0.0	1.3
% Intermediate species		0.0	0.3
% Open country species		0.3	0.0
% Marsh		0.1	0.4
% Amphibious		0.1	4.1
% Catholic		13.4	15.5
% Slum		0.2	10.1
% Moving water		46.8	64.3
% Unassigned		39.2	4.0

Table 20 Pollen from evaluation Trenches 3778TT and 3780TT at the Goresbrook diversion (ARC GOR00)

Trench Lithology Context	3778TT							3780TT										
	Peat			Organic silty clay				Upper silty clays				Peat			Upper silty clays			
	7808	7807	7807	7807	7806	7804	7805	7803	8004	8004	8004	8004	8003	8003	8002			
Trees																		
<i>Picea</i>	-	-	-	-	1	2	-	-	-	-	-	-	-	-	-			
<i>Pinus sylvestris</i>	1	2	4	2	2	4	1	3	-	-	1	1	-	1	3			
<i>Ulmus</i>	1	1	3	2	2	-	3	-	-	2	2	1	2	1	2			
<i>Fagus sylvatica</i>	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-			
<i>Quercus</i>	4	5	2	7	3	10	5	6	-	1	5	1	2	1	3			
<i>Betula</i>	1	-	3	-	3	-	1	-	-	4	5	2	1	2	1			
<i>Alnus glutinosa</i>	3	65	115	14	17	9	7	12	5	15	4	3	6	10	2			
<i>Carpinus betulus</i>	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-			
<i>Tilia cordata</i>	-	-	-	-	1	2	-	-	-	1	-	-	1	-	-			
<i>Fraxinus excelsior</i>	-	1	1	1	-	-	-	1	-	-	2	1	2	-	6			
Shrubs																		
<i>Corylus avellana</i> -type	2	3	7	15	13	13	4	8	2	15	5	3	6	6	8			
<i>Salix</i>	-	1	-	-	1	1	-	-	-	-	1	1	1	-	-			
Ericaceae	-	-	-	-	1	-	-	-	-	1	-	-	-	-	-			
<i>Sorbus</i> -type	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-			
<i>Hedera helix</i>	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-			
Herbs																		
Ranunculaceae	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-			
<i>Ranunculus acris</i> -type	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-			
Chenopodiaceae	2	1	1	11	8	20	6	21	-	-	-	1	1	7	3			
Caryophyllaceae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1			
Plumbaginaceae	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-			
<i>Limonium</i>	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-			
<i>Filipendula</i>	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-			
<i>Saxifraga granulata</i> -type	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1			
Apiaceae	-	1	-	-	-	1	-	-	-	-	-	1	-	-	-			
Plantaginaceae	-	2	1	1	7	11	51	22	-	-	-	1	1	13	2			
<i>Plantago maritima</i>	-	2	-	-	-	-	9	2	-	-	-	-	-	5	-			
<i>Plantago lanceolata</i>	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-			
Scrophulariaceae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1			
<i>Veronica</i>	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-			
Rubiaceae	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-			
<i>Valerian adioica</i>	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Arctium</i> -type	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-			
Lactuceae	-	-	-	-	1	1	6	3	-	-	-	1	3	13	5			
<i>Solidago virgaurea</i> -type	1	-	-	3	1	1	1	3	-	-	-	-	-	1	3			
<i>Artemisia</i> -type	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-			
Cyperaceae undiff.	11	1	1		2	5	-	11	2	5	1	10	2	11	6			
Poaceae undiff.	8	3	7	18	22	10	31	9	1	8		16	13	32	65			
Aquatics																		
Potamogetonaceae	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-			
<i>Potamogeton filiformis</i> -type	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-			
<i>Sparganium emersum</i> -type	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-			
<i>Typha latifolia</i>	-	-	-	-	1	-	-	-	-	1	-	-	-	-	-			

Table 20 Continued

Trench Lithology Context	3778TT								3780TT										
	Peat				Organic silty clay				Upper silty clays				Peat			Upper silty clays			
	7808	7807	7807	7807	7806	7804	7805	7803	8004	8004	8004	8004	8004	8003	8003	8002			
Spores																			
<i>Osmunda regalis</i>	-	-	-	-	-	-	-	-	5	1	4	1	11	-	-				
<i>Polypodium</i>	-	1	-	2	6	1	-	1	-	-	-	1	-	-	-				
<i>Pteridium aquilinum</i>	1	-	2	10	16	5	1	3	-	-	2	4	-	-	1				
<i>Thelypteris palustris</i>	13	1	-	-	-	-	-	-	-	2	-	-	-	-	-				
<i>Pteropsida</i> (monoete) indet.	80	17	-	32	24	12	9	15	5	10	21	86	51	38	15				
<i>Sphagnum</i>	1	-	-	3	1	-	-	-	-	-	-	-	2	-	2				
Charcoal	64	40	68	328	246	306	105	243	7	10	160	69	800	632	771				
Others																			
Fungal spores	-	+	+	+	+	+	+	+	+	+	+	+	-	+	+				
Foraminifera	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-				
<i>Amphitrema flavum</i>	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-				
Other rhizopods	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-				
Dinoflagellates	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-				
Type 143 fungal spore	-	-	-	-	1	-	-	-	-	-	-	1	-	-	-				

Table 21 Waterlogged plant remains from evaluation Trenches 3778TT and 3780TT at the Goresbrook diversion (ARC GOR00)

Taxa	Common name	Trench Lithology Context Sample Weight of sediment (kg)	3778TT						3780TT			
			Peat	Organic clay	Upper silts and clays				Peat	Upper silty clays		
			7808	7807	7806	7805	7804	7803	7803	8004	8003	8002
			7	6	5	4	3	2	1	20	19	18
			0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
<i>Ranunculus cf repens</i>	creeping buttercup	-	-	+	-	-	-	-	-	-	+	-
<i>R. sceleratus</i>	celery-leaved crowfoot	-	-	-	+	++	+	-	-	+	-	-
<i>Viola S. Viola sp.</i>	violet	-	-	-	-	-	-	-	-	-	-	-
<i>Lychmis flos-cuculi</i>	ragged robin	-	-	-	-	-	-	-	+	-	-	-
<i>Moehringia trinervia</i>	sandwort	-	-	-	-	-	-	-	+	-	-	-
<i>Rubus fruticosus</i> agg.	blackberry	-	-	+	-	+	-	-	+	-	-	-
<i>Potentilla cf reptans</i>	creeping cinquefoil	-	-	-	-	-	+	-	-	-	-	-
<i>Epilobium</i> sp.	willowherb	-	-	-	-	+	-	-	+	-	-	-
<i>Hippuris vulgaris</i>	mare's tail	-	-	-	-	-	-	-	-	-	-	-
<i>Hydrocotyle vulgaris</i>	marsh pennywort	+	-	-	-	-	-	-	-	-	-	-
<i>Berula erecta</i>	water parsnip	+	-	-	-	-	-	-	+	-	-	-
<i>Rumex</i> sp.	dock	-	-	-	-	+	-	-	-	+	-	-
<i>Alnus glutinosa</i>	alder	-	+	-	-	-	-	-	-	-	-	-
<i>Galium</i> sp.	bedstraw	-	-	-	-	-	-	-	+	-	-	-
<i>Eupatorium cannabinum</i>	hemp agrimony	-	-	-	-	-	-	-	+	-	-	-
<i>Carduus</i> sp.	thistle	-	-	-	-	+	+	-	-	+	-	-
<i>Sonchus oleraceus</i>	sowthistle	-	-	-	-	-	-	-	-	-	-	+
<i>S. asper</i>	sowthistle	-	-	-	-	+	-	-	-	-	-	-
<i>Potamogeton</i> sp.	pondweed	-	-	-	-	-	-	-	+	-	-	-
<i>Juncus</i> sp.	rush	-	-	-	-	-	+	+	+	+	-	-
<i>Schoenoplectus lacustris</i>	bulrush	-	-	-	-	-	-	-	+	-	-	-
<i>Carex</i> sp.	sedge	+	+	-	-	-	-	-	+	+	-	-
Gramineae indet.	grass	-	-	-	-	-	+	-	-	-	-	-

+ present ++ many

Table 22 Insects from evaluation Trench 3780TT at the Goresbrook diversion (ARC GOR00)

Lithology	Peat	Silty clay
Context	8004	8003
Sample	20	19
Weight of sediment (kg)	2	2
Taxa		
<i>Bembidion</i> sp.	-	+
<i>Colymbetes fuscus</i>	+	-
<i>Hydrobius fuscipes</i>	-	+
<i>Aphodius</i> sp.	+	+
cf <i>Cyphon</i> sp.	+	-
<i>Dryops</i> sp.	+	-
<i>Plateumaris braccata</i>	+	-
<i>Longitarsus</i> sp.	-	+
<i>Apion</i> sp.	-	+
<i>Thryogenes</i> sp.	+	-

+ present

Table 23 Pollen from Chainage 20.5km, Ripple Lane tunnel portal (ARC 25001)

Lithology	Basal sandy deposits							Peat					
	Context number	2053	2045	2045	2044	2044	2044	2044	2044	2043	2043	2043	2043
Trees & shrubs													
<i>Acer campestre</i> -type	-	-	-	-	-	-	-	-	-	-	-	-	1
<i>Alnus glutinosa</i>	81	1	10	14	5	124	7	44	11	41	54	52	3
<i>Betula</i>	4	5	5	2	3	11	1	65	19	100	93	3	3
<i>Corylus avellana</i> -type	7	1	3	10	3	12	1	12	4	5	26	1	1
<i>Fraxinus excelsior</i>	2	-	-	-	-	2	1	-	-	-	2	-	-
<i>Hedera helix</i>	-	-	-	-	-	-	-	-	-	1	1	1	1
<i>Ilex aquifolium</i>	-	-	-	-	-	-	-	1	1	1	-	-	-
<i>Pinus sylvestris</i>	1	1	-	-	-	-	-	-	-	1	-	-	-
<i>Quercus</i>	15	-	1	8	1	23	3	14	4	19	33	27	27
<i>Salix</i>	3	-	-	-	1	3	1	4	-	11	48	1	1
<i>Sambucus</i>	-	-	-	-	1	-	-	-	-	-	-	-	-
<i>Taxus baccata</i>	1	-	-	-	1	-	-	-	-	-	-	-	-
<i>Tilia cordata</i>	4	-	3	6	1	3	1	4	-	-	6	-	-
<i>Ulmus</i>	3	-	1	3	-	1	1	1	-	2	6	-	-
Crops													
Cereal-type	-	-	-	-	-	-	1	-	-	-	-	-	-
Herbs													
Poaceae	3	24	4	4	1	2	2	2	3	5	8	22	22
Cyperaceae	34	-	3	-	1	11	3	23	-	19	15	20	20
Apiaceae	2	-	-	-	-	-	1	-	-	-	-	-	-
<i>Solidago virgaurea</i> -type	1	-	-	-	-	-	-	-	-	-	-	-	-
<i>Artemisia</i> -type	-	-	-	-	-	-	-	-	-	1	-	-	-
Lactuceae	-	-	-	-	-	-	-	-	-	-	-	3	3
<i>Hypericum perforatum</i> -type	-	-	-	-	-	-	-	-	-	-	-	1	1
<i>Plantago lanceolata</i>	1	-	-	-	-	-	-	1	-	-	-	1	1
Rubiaceae	2	-	-	-	-	2	-	-	-	-	-	-	-
<i>Rumex</i>	-	-	-	-	-	-	-	-	-	-	1	-	-
Pteridophytes													
<i>Athyrium filix-femina</i>	1	-	1	2	-	9	2	-	-	-	2	-	-
<i>Dryopteris</i>	-	-	-	-	-	3	-	-	-	-	-	-	-
<i>Osmunda regalis</i>	-	-	-	-	1	-	-	-	4	51	53	-	-
<i>Polypodium vulgare</i> -type	-	-	-	-	-	2	-	1	-	1	-	-	-
<i>Pteridium aquilinum</i>	2	1	3	-	2	-	-	-	-	-	-	6	6
<i>Thelypteris palustris</i>	51	-	-	-	-	86	1	-	-	-	-	-	-
Pteropsida (monoete) indet.	98	4	4	7	20	660	36	13	2	17	15	38	38
<i>Sphagnum</i>	-	-	-	-	-	-	-	-	8	1	12	-	-
Aquatics													
<i>Potamogeton</i>	-	-	1	1	-	3	1	3	-	-	-	3	3
<i>Typha angustifolia</i>	2	-	-	-	-	8	-	-	-	-	-	3	3
<i>Typha latifolia</i>	-	-	-	-	-	21	-	-	-	-	-	-	-
Unidentifiable	9	6	6	8	2	5	3	25	3	16	24	15	15
Charcoal	54	960	665	126	48	55	30	50	20	110	160	4500	4500

Table 24 Pollen from Chainage 20.6km, Ripple Lane tunnel portal (ARC 25001)

Lithology Context number	SC		Peat								SC		
	2064	2062	2062	2063	2062	2062	2062	2062	2061	2061	2061	2061	2060
Trees & shrubs													
<i>Alnus glutinosa</i>	159	149	45	6	6	30	27	23	53	5	18	55	89
<i>Betula</i>	15	6	4	-	2	3	3	69	29	4	16	3	8
<i>Carpinus</i>	1	-	-	-	-	-	-	-	-	-	-	-	-
<i>Corylus avellana</i> -type	10	7	1	1	4	3	6	4	7	-	11	5	7
<i>Fraxinus excelsior</i>	2	1	-	1	-	1	-	-	1	-	-	-	-
<i>Hedera helix</i>	-	-	1	-	1	-	-	1	-	-	-	-	-
<i>Ilex aquifolium</i>	-	-	-	-	-	-	-	-	-	-	-	1	-
<i>Pinus sylvestris</i>	1	1	2	-	-	-	2	1	1	-	-	1	2
<i>Quercus</i>	41	33	1	6	-	8	8	20	13	2	17	14	5
Rosaceae	-	-	-	-	-	-	-	1	-	-	-	-	-
<i>Salix</i>	-	-	-	-	-	-	-	2	1	-	-	1	3
<i>Taxus baccata</i>	-	-	-	1	-	-	-	-	-	-	-	-	1
<i>Tilia cordata</i>	6	4	12	3	1	1	2	2	5	-	-	1	-
<i>Ulmus</i>	2	6	1	1	3	-	-	2	1	-	-	-	3
<i>Vaccinium</i>	-	-	-	-	-	-	-	-	1	-	-	-	1
<i>Sambucus</i>	-	-	-	-	-	-	-	-	-	-	-	1	-
Crops													
Cereal-type	-	-	-	-	-	-	-	-	-	-	-	-	2
Herbs													
Poaceae	3	2	1	-	1	4	2	1	1	-	4	6	33
Cyperaceae	42	12	2	-	-	10	42	28	8	-	19	5	1
Apiaceae	-	-	1	-	-	-	-	-	-	-	-	-	-
<i>Anthemis</i> -type	-	-	-	-	-	-	-	-	-	1	-	-	2
<i>Solidago virgaurea</i> -type	-	-	-	-	-	-	-	-	1	-	-	-	1
<i>Cirsium</i> -type	-	-	-	-	-	-	-	-	-	-	-	-	3
Lactuceae	-	-	-	-	-	-	-	-	-	-	-	2	11
Brassicaceae undiff	-	-	-	-	-	-	-	-	-	-	-	-	1
Chenopodiaceae	-	-	-	-	-	-	-	-	-	-	-	2	4
<i>Plantago lanceolata</i>	-	-	-	-	-	-	-	-	-	-	-	-	1
Rubiaceae	-	-	-	-	-	-	-	1	-	-	-	-	-
<i>Succisa pratensis</i>	-	-	-	-	-	-	-	-	-	-	-	-	1
<i>Urtica</i>	1	-	-	-	-	-	-	-	-	-	-	-	-
Pteridophytes													
<i>Athyrium filix-femina</i>	-	2	1	3	8	-	4	-	16	-	1	-	-
<i>Polypodium vulgare</i> -type	3	2	1	-	-	1	2	-	2	-	2	3	1
<i>Pteridium aquilinum</i>	3	3	4	-	-	-	-	-	1	-	-	5	8
<i>Thelypteris palustris</i>	-	-	1	-	-	1	4	54	172	-	38	-	-
<i>Osmunda regalis</i>	-	-	-	-	-	-	-	-	3	-	4	-	-
Pteropsida (monolete) indet.	300	252	35	6	17	13	87	44	907	20	217	15	18
Sphagnum	1	-	-	-	-	1	-	-	-	-	-	-	2
Aquatics													
<i>Potamogeton</i>	1	1	-	-	-	-	-	1	-	-	-	-	1
<i>Typha angustifolia</i>	1	-	-	-	-	1	2	4	-	-	-	-	-
<i>Typha latifolia</i>	1	-	-	-	-	-	-	8	-	-	-	-	-
Unidentifiable	11	12	3	2	1	6	5	6	2	2	16	8	16
Charcoal	131	105	450	40	28	18	50	81	80	330	78	750	470

Table 25 Ostracods from Chainage 20.6km, Ripple Lane tunnel portal (ARC 25001)

Lithology	Upper silty clay
Sample	Monolith 1031
Context	2060
Weight of sediment (kg)	0.2
Brackish water ostracods	
<i>Cyprideis torosa</i> (smooth)	+++
<i>Cytherura gibba</i>	++
<i>Loxococoncha elliptica</i>	+
<i>Leptocythere porcellanea</i>	+

+ present (a few specimens) ++ common +++ abundant

Table 26 Waterlogged plant remains from Chainages 20.97km and 21.09km, Dagenham Vale (ARC 36100)

	Chainage	20.97km		21.09km			
		Lithology	Organic sandy silt	Organic silt	Peat	Peat	Organic silty clay
	Context	128	127	126	105	104	103
	Sample	275	274	273	123	122	119
	Weight of sediment (kg)	1	1	1	1	1	1
Taxa	Common name						
<i>Ranunculus cf repens</i>	buttercup	-	+	-	-	-	-
<i>Stellaria neglecta</i>	greater chickweed	-	+	-	-	-	-
<i>Rubus fruticosus</i> agg.	blackberry	+	-	-	+	-	-
<i>Potentilla anserina</i>	silverweed	-	-	-	+	-	-
<i>Callitriche</i> sp.	starwort	-	-	-	-	+	-
<i>Oenanthe aquatica</i> gp.	water dropwort	-	-	+	-	-	-
<i>Alnus glutinosa</i>	alder	+	+	++	-	-	-
<i>A. glutinosa</i>	alder (female catkin)	-	-	+	-	-	-
<i>Mentha</i> sp.	mint	-	-	-	+	-	+
<i>Lycopus europaeus</i>	gipsy-wort	-	+	+	-	-	-
<i>Alisma</i> sp.	water-plantain	-	+	-	+	-	+
<i>Juncus</i> spp.	rush	-	-	-	+	-	+
<i>Scirpus sylvaticus</i>	wood club-rush	+	-	-	-	-	-
<i>Carex</i> spp.	sedge	+	-	-	-	-	-

+ present ++ many

Table 27 Insects from Chainages 20.97km and 21.09km, Dagenham Vale (ARC 36100)

Chainage	20.97km		21.09km
	Lithology	Organic silt	Peat
Context	127	126	105
Sample	274	273	123
Weight of sediment (kg)	1	1	1
Coleoptera			
<i>Agonum</i> sp.	+	-	-
<i>Agabus</i> sp. (not <i>bipustulatus</i>)	+	-	-
<i>Megasternum obscurum</i>	-	+	-
<i>Anacaena</i> sp.	+	-	-
<i>Ochthebius cf minimus</i>	-	+	-
<i>Hydraena testacea</i>	+	-	-
<i>Limnebius nitidus</i>	+	-	-
<i>Silpha atrata</i>	-	+	-
<i>Geotrupes</i> sp.	-	-	+
<i>Aphodius</i> sp.	-	-	+
cf <i>Cercyon</i> sp.	+	+	-
<i>Ctenicera</i> sp.	-	+	-
<i>Corylophus cassidoides</i>	-	+	-
<i>Phymatodes alni</i>	-	+	-
<i>Prasocuris phellandrii</i>	+	-	-
<i>Chrysomela aenea</i>	-	+	-
<i>Rhynchaemus testaceus</i>	+	-	-
Other insects			
Homoptera indet.	+	-	-
Trichoptera larva indet.	+	+	-
Hymenoptera indet.	+	-	-
Chironomid larva indet.	+	-	-

+ present

Table 28 Pollen from Chainages 20.97km and 21.09km, Dagenham Vale (ARC 36100)

Chainage Lithology Context	20.97km			20.09km					
	Sand	Org SS	Peat	Peat	Org SC	Upper silty clays			
	130	127	126	105	104	103	103	102	102
Trees and shrubs									
<i>Betula</i>	-	1	13	3	-	2	1	1	1
<i>Pinus</i>	1	1	-	-	1	2	4	7	11
<i>Picea</i>	-	-	-	-	-	-	1	-	-
<i>Ulmus</i>	-	1	-	1	-	1	1	-	1
<i>Quercus</i>	-	15	50	16	19	17	14	21	9
<i>Tilia</i>	-	-	16	-	-	1	-	-	-
<i>Fraxinus</i>	-	-	-	-	1	-	1	-	-
<i>Corylus avellana</i> -type	-	13	12	22	6	1	15	13	6
<i>Viburnum</i>	-	1	-	-	-	-	-	-	-
Herbs									
<i>Ranunculus</i> -type	-	-	1	1	1	-	-	1	-
<i>Sinapsis</i> -type	-	-	-	-	-	1	5	4	2
<i>Hornungia</i> -type	-	-	-	-	-	-	-	1	-
<i>Dianthus</i> -type	-	-	-	1	-	-	-	-	-
<i>Chenopodium</i> -type	-	-	-	-	11	-	7	5	17
Rosaceae	-	-	-	1	-	-	-	-	-
<i>Filipendula</i>	-	-	-	1	-	-	-	-	-
<i>Agrimonia</i>	-	-	-	-	-	-	1	-	-
Scrophulariaceae	-	-	-	1	-	-	-	1	-
Apiaceae	-	-	1	1	-	-	-	-	-
Lamiaceae	-	-	-	-	-	-	-	-	1
<i>Plantago major</i> -type	-	-	-	-	1	-	-	-	-
<i>Plantago lanceolata</i>	-	-	-	6	-	1	-	-	1
<i>Bidens</i> -type	-	-	-	-	-	-	1	-	7
<i>Anthemis</i> -type	-	-	-	-	-	-	1	-	-
<i>Cirsium</i> -type	-	-	-	-	-	-	-	1	-
Lactucoideae	-	-	-	3	7	8	1	3	-
Poaceae	6	2	7	37	49	53	22	35	13
<i>Cerealia</i> -type	1	-	-	-	1	2	2	-	9
Large Poaceae	-	-	-	-	1	-	-	1	-
Unident/degraded	-	-	-	1	-	-	3	5	1
Marsh									
<i>Alnus</i>	4	65	1026	94	6	15	26	68	20
<i>Salix</i>	-	-	-	18	-	-	-	-	-
<i>Alisma</i> -type	-	-	-	-	1	-	-	-	-
<i>Myriophyllum spicatum</i>	-	-	-	-	1	-	-	-	-
<i>Potamogeton</i>	-	-	-	-	-	2	1	1	-
<i>Typha angustifolia</i> -type	-	-	-	-	8	3	19	1	1
Cyperaceae	1	1	57	33	9	11	9	14	3
<i>Caltha</i> -type	1	-	-	-	-	-	-	-	-
Spores									
<i>Pteridium aquilinum</i>	4	2	-	4	1	6	12	12	18
<i>Dryopteris</i> -type	-	4	58	28	9	9	9	27	22
<i>Polypodium vulgare</i>	-	1	-	1	-	-	-	-	1
<i>Sphagnum</i>	-	-	-	-	-	1	-	-	-
Misc									
<i>Pediastrum</i>	-	-	-	-	-	-	-	-	1
Zygnemataceae	-	-	-	-	-	-	-	-	-
Hystrichospheres	-	-	-	-	-	3	1	2	7
Pre-Quaternary	-	-	-	-	-	3	9	17	5

Table 29 Ostracods and foraminifera from Chainage 21.09km, Dagenham Vale (ARC 36100)

Lithology	Upper silty clays				
	Sample	116	117	118	121
Context	102	102	102	103	
Weight of sediment (kg)	0.2	0.2	0.2	0.2	
Brackish water ostracods					
<i>Cyprideis torosa</i>	+++	+	+	++	
<i>Loxococoncha elliptica</i>	-	-	+	-	
<i>Cytherura gibba</i>	-	-	+	-	
<i>Leptocythere porcellanea</i>	-	-	+	-	
Marine ostracods					
<i>Pontocythere elongata</i>	-	-	+	-	
<i>Hirschmannia viridis</i>	-	-	+	-	
<i>Semicytherura nigrescens</i>	-	-	+	-	
<i>Semicytherura acuticostata</i>	-	-	+	-	
<i>Heterocythereis albomaculata</i>	-	-	+	-	
<i>Elofsonella concinna</i>	-	-	+	-	
<i>Robertsonites tuberculatus</i>	-	-	+	-	
Freshwater ostracods					
<i>Candona</i> spp.	-	-	+	+	
<i>Limnocythere inopinata</i>	-	-	+	-	
Foraminifera					
<i>Haynesina germanica</i>	++	-	++	+	
<i>Ammonia limnetes</i>	++	+	++	+	
<i>Elphidium williamsoni</i>	+	-	++	-	
<i>Elphidium margaritaceum</i>	+	-	+	-	
<i>Lagena</i> spp.	-	-	+	+	

+ present (a few specimens) ++ common +++ abundant

Table 31 Pollen from Chainage 22.95km, Mudlands (ARC 36100)

Lithology	Peat		Upper silty clays			
	Context	199	199	198	197	197
Trees and shrubs						
<i>Betula</i>		1	1	-	-	1
<i>Pinus</i>		-	2	3	5	9
<i>Ulmus</i>		-	2	1	-	-
<i>Quercus</i>		69	62	39	8	18
<i>Tilia</i>		14	4	6	5	6
<i>Fraxinus</i>		3	-	3	-	-
<i>Corylus avellana</i> -type		10	26	37	13	9
Herbs						
<i>Ranunculus</i> -type		-	1	-	3	-
<i>Chenopodium</i> -type		-	-	3	3	3
<i>Hedera helix</i>		1	1	1	-	-
Apiaceae		1	-	1	-	-
<i>Rumex</i>		1	-	-	-	-
Scrophulariaceae		1	-	1	-	-
<i>Mentha</i> -type		-	-	-	1	-

Table 31 Continued

Lithology Context	Peat		Upper silty clays		
	199	199	198	197	197
<i>Plantago lanceolata</i>	-	1	-	7	-
<i>Bidens</i> -type	-	-	-	1	-
<i>Artemisia</i>	-	-	1	-	-
Lactucoideae	-	-	-	-	5
Poaceae	1	2	5	45	39
Large Poaceae	-	-	-	9	-
<i>Cerealia</i> -type	-	-	-	-	2
Unident/degraded	-	-	-	1	7
Marsh					
<i>Alnus</i>	192	196	166	41	10
<i>Salix</i>	1	-	-	-	-
cf <i>Littorella uniflora</i>	-	-	-	1	-
<i>Potamogeton</i>	-	-	1	1	-
<i>Iris</i>	-	-	-	1	-
<i>Typha angustifolia</i> -type	-	-	1	2	1
Cyperaceae	2	2	11	10	12
Spores					
<i>Pteridium aquilinum</i>	-	-	5	23	69
<i>Dryopteris</i> -type	49	10	14	10	23
<i>Polypodium vulgare</i>	2	-	-	1	1
<i>Sphagnum</i>	-	-	-	1	1
Liverworts	-	-	-	1	-
Misc					
<i>Pediastrum</i>	-	-	-	7	-
Hystichospheres	-	-	3	-	-
Pre-Quaternary	-	-	2	-	-

Table 32 Waterlogged plant remains from Chainage 22.95km, Mudlands (ARC 36100)

Taxa	Common name	Lithology Context	Peat			Upper silty clays	
			199	199	199	198	197
		Sample	286	287	288	293	294
		Weight of sediment (kg)	1	1	1	1	1
<i>Rubus fruticosus</i> agg.	blackberry		+	-	-	-	-
<i>Oenanthe aquatica</i> gp.	water dropwort		-	-	+	-	-
<i>Alnus glutinosa</i>	alder		++	+	-	-	-
<i>A. glutinosa</i>	alder (female catkin)		+	-	-	-	-
<i>Lycopus europaeus</i>	gipsy-wort		+	+	-	-	-
<i>Juncus</i> spp.	rush		-	-	-	++	-
<i>Lemma</i> sp.	duckweed		-	-	+	-	-

+ present ++ common

Table 33 Ostracods from Chainage 22.95km, Mudlands (ARC 36100)

	Lithology	Peat	
	Context	199	197
	Sample	289	294
Weight of sediment (kg)		0.2	0.2
Brackish water ostracods			
<i>Cyprideis torosa</i>		-	+
<i>Leptocythere porcellanea</i>		-	+
Fresh water ostracods			
<i>Cypria ophthalmica</i>		+	-
Foraminifera			
<i>Haynesina germanica</i>		-	+
<i>Ammonia limnetes</i>		-	+

+ present (a few specimens)

Table 35 Waterlogged plant remains and charcoal from Chainage 25.455km, East of Ferry Lane, Rainham Marsh (ARC 36100)

	Lithology	Sand	Peat	Channel	
				Context	194
Weight of sediment (kg)		1	1	1	1
Taxa	Common name				
<i>Ranunculus acris/repens/bulbosus</i>	buttercup	-	-	-	+
<i>Ranunculus sceleratus</i>	celery-leaved crowfoot	-	-	+	+
<i>Ranunculus</i> subg. <i>Batrachium</i>	crowfoot	-	-	+	+
<i>Stellaria media</i> agg.	chickweed	-	-	+	+
<i>Atriplex</i> sp.	orache	-	-	+	-
<i>Chenopodium album</i>	fat hen	-	-	+	-
<i>Rubus</i> sp.	bramble	-	-	+	-
<i>Apium nodiflorum</i>	fool's watercress	-	-	-	+
Umbelliferae		-	-	-	+
<i>Rumex</i> sp.	docks	-	-	-	+
<i>Urtica dioica</i>	stinging nettle	-	+	-	-
Compositae		-	-	-	+
<i>Alisma plantago-aquatica</i>	water-plantain	-	-	-	+
<i>Juncus</i> sp.	rush	-	-	-	-
<i>Eleocharis palustris</i>	common spikerush	-	-	+	-
<i>Carex</i> spp.	sedges	-	-	+	+
Gramineae	grass, large seeded	-	-	-	-
Wood Fragments		+	+++	+++	++
<i>Quercus</i> sp.	oak charcoal fragments	+	-	-	-
Indet	indeterminate charcoal	-	-	+	-

+ present ++common +++ abundant

Table 36 Pollen from Chainage 25.455km, East of Ferry Lane, Rainham Marsh (ARC 36100)

Lithology Context Sample	Sand		Peat		Channel				SC
	192	193	193	194	194	194	195		
	253	253	253	253	253	254	255		
Trees and shrubs									
<i>Betula</i>	1	1	-	4	1	3	1	1	
<i>Pinus</i>	3	1	-	1	-	2	2	1	
<i>Acer</i>	-	-	1	-	-	-	-	-	
<i>Ulmus</i>	-	3	-	1	3	1	2	-	
<i>Quercus</i>	20	49	57	35	26	13	12	15	
<i>Tilia</i>	12	36	11	3	5	-	4	-	
<i>Fraxinus</i>	-	1	3	-	-	-	2	-	
<i>Sorbus</i> -type	-	-	1	-	-	-	-	-	
<i>Corylus avellana</i> -type	12	14	28	5	11	2	8	12	
<i>Erica</i>	-	-	-	-	1	-	-	-	
<i>Calluna</i>	-	-	-	-	1	-	-	1	
Herbs									
<i>Ranunculus</i> -type	-	-	-	-	-	1	-	1	
<i>Sinapis</i> -type	-	-	-	1	-	-	1	-	
<i>Hornungia</i> -type	-	-	-	-	1	-	1	-	
<i>Dianthus</i> -type	-	-	-	-	-	-	-	1	
<i>Chenopodium</i> -type	-	-	-	1	3	5	7	5	
<i>Trifolium</i> -type	-	-	-	-	-	-	1	-	
<i>Filipendula</i>	-	-	-	-	1	-	-	-	
<i>Hedera</i>	-	-	-	1	-	-	-	-	
Apiaceae	-	-	-	-	-	-	-	-	
<i>Rumex</i>	-	-	-	4	2	2	-	-	
<i>Myosotis</i>	-	-	1	-	-	-	-	-	
<i>Plantago major</i> -type	-	-	-	-	1	-	-	-	
<i>Plantago lanceolata</i>	-	-	1	3	-	2	-	4	
<i>Plantago maritime</i> -type	-	-	-	-	-	1	1	-	
<i>Plantago coronopus</i> -type	-	-	-	-	1	-	3	-	
<i>Galium</i>	-	-	-	1	-	-	-	-	
<i>Bidens</i> -type	-	-	-	-	1	3	1	-	
<i>Anthemis</i> -type	-	-	-	-	-	1	-	-	
<i>Aster</i> -type	-	-	-	-	-	1	-	-	
<i>Cirsium</i> -type	-	-	-	-	-	-	-	1	
Lactucoideae	1	1	-	4	2	9	1	1	
Poaceae	4	2	1	36	41	57	52	56	
<i>Cereal</i> ia-type	-	-	-	-	1	1	-	4	
Large Poaceae	-	-	-	-	-	-	2	-	
Unident/degraded	3	-	-	-	1	-	-	-	
Marsh									
<i>Alnus</i>	46	124	214	117	38	46	34	1	
<i>Salix</i>	-	-	-	3	-	-	-	-	
<i>Alisma</i> -type	-	-	-	-	-	-	-	1	
<i>Potamogeton</i>	-	-	-	-	1	-	-	-	
<i>Typha angustifolia</i> -type	-	-	-	-	-	-	3	10	
Cyperaceae	11	2	2	12	22	24	23	25	
Spores									
<i>Equisetum</i>	-	1	-	-	-	-	-	-	
<i>Pteridium aquilinum</i>	10	3	1	5	7	9	6	8	
<i>Dryopteris</i> -type	22	24	40	16	24	37	8	4	
<i>Polypodium vulgare</i>	-	4	1	1	1	-	-	1	
<i>Sphagnum</i>	1	1	-	-	1	-	1	-	
Liverworts	-	-	-	-	-	-	-	-	
Misc									
<i>Pediastrum</i>	-	-	-	-	7	-	1	-	
Pre-Quaternary	1	-	-	-	-	-	-	2	

Table 37 3972TT lithostratigraphy

Stratigraphy	Elevation (mOD)	Depth (m)	Context number	Description		
Topsoil	+0.68 to +0.54	0.00–0.14	1	TOPSOIL: Friable, brownish grey (10YR 4/1) silty clay, well rooted		
Upper alluvium	+0.54 to -0.64	0.14–0.70	2	SILTY CLAY: Firm oxidised silty clay, greyish yellow brown (10YR 5/2) in upper 0.45m. Massive and structureless, heavily bioturbated, frequent fine modern roots. Below 0.6m increase in Fe mottling (bright yellowish brown 10YR 6/6 and light grey 10Y 7/1). 5% white carbonate flecks concentrated at the contact with (3)		
		0.70–0.82	3	SILTY CLAY: Very firm, tenacious mid-grey (10Y 6/1) silty clay. Massive and structureless, 5% white carbonate flecks at upper contact, occasional fine roots		
		0.82–1.32	4	SILTY CLAY: Firm, tenacious, bright yellowish brown (10YR 6/6) and grey (10Y 6/1) mottled, silty clay. Massive and structureless, occasional fine roots. Rare white carbonate flecking		
Organic complex	-0.64 to -3.86	1.32–1.38	5a	ORGANIC SILTY CLAY: Friable, soft brownish grey (7.5YR 4/1) silty clay. Massive and structureless. Frequent fine roots and faint Fe oxidation		
		1.38–1.46	5b	PEATY CLAY: Firm, dense, brownish black (7.5YR 3/1), well humified peaty clay silt, occasional fine roots and plant fibres		
		1.46–1.61	6	ORGANIC SILTY CLAY: Soft, tenacious, brownish grey (10YR 4/1) and bright yellowish brown (10YR 6/8) mottled silty clay. 10% organic material, occasional woody detritus (10mm D x 10mm L) frequent plant fibres and rootlets		
		1.61–1.66	7a	PEATY SILT: Firm dark reddish brown (5YR 3/2) well humified peaty silt. Root boles identified at interface with (6) extending 0.10–0.20m into (7) and contained a higher % of woody root material		
		1.66–1.89	7b	ORGANIC SILTY CLAY: Soft, tenacious brownish grey (7.5 YR 4/1) fibrous silty clay with frequent small roots		
		1.89–2.55	8	ORGANIC SILTY CLAY: Very tenacious, soft, greyish brown (7.5Y 5/2), fibrous silty clay, 15–20% organic material, dominated by reeds rooted <i>in situ</i> (5–10mm D), very occasional woody detritus (10–20mm D x 20–40mm L)		
		2.55–2.63	9	PEAT: Dry, friable, brownish black (5YR 3/1) oxidizing to black (5YR 1.7/1), well humified, rooted (5–10%) slightly silty (15%) amorphous peat. Woody fragments frequent (5–10mm D x 10–40mm L)		
		2.63–2.93	10	SILTY PEAT: Soft, dry, friable, greyish brown (5YR 3/2) oxidising to brownish black (5YR 2/1), 25% silt. Frequent woody roots and bark (5–20mm D x 20–50mm L), plant fibres and rare hazelnut shell. Occasional very large timber with root balls attached and branches lying horizontally; <i>Taxus baccata</i> (yew), <i>Alnus glutinosa</i> (alder) <i>Quercus</i> (oak) and <i>Fraxinus</i> (ash).		
		2.93–3.8	11	SILTY PEAT: Soft, tenacious, brownish grey (5YR 4/1) poorly humified, slightly clayey, very silty peat, fibrous, very few woody fragments, some bark detritus, predominately vertically, well rooted reed type material (3–5mm D x 50mm L)		
		3.8–4.47	12	PEAT: Soft, dark reddish brown (5YR 3/3) oxidising to brownish black (5YR 2/1), peat. Frequent woody inclusions (10–50mm D x 100mm L). Occasional horizontal trunks/branches with root balls attached. Frequent fibres (<1mm), occasional reedy material noted		
		4.37–4.54	13	SILTY PEAT: Soft, dark reddish brown (2.5YR 3/2) slightly silty (15%) peat, oxidising to brownish black (5YR 2/1). Roots (5mm–10mm D X 20–50mm L), Frequent plant fibres.		
		Lower alluvium	-3.86 to -3.99	4.54–4.60	14	ORGANIC CLAYEY SILT: Soft, tenacious, yellowish grey (2.5Y 4/1) to greyish yellow (2.5Y 4/2) organic fibrous clay silt, 20–25% organic material, frequent reeds, occasional woody detritus
				4.60–4.67	15	CLAYEY SILT: Soft, very tenacious grey (7.5 Y 5/1) to greyish olive (7.5Y 5/2), clay silt, 15% organic material, fibrous, <i>in situ</i> reeds (5mm–10mm D)

Table 38 Waterlogged plant remains from Trench 3972TT, Rainham Marsh (ARC TAM01)

	Lithology	Organic complex (lower)									Organic complex (upper)						
		Context		14	13	12	12	11	11	11	10	9	8	8	6	5b	5a
		Weight of sediment (kg)		1	1	1	1	1	1	1	1	1	1	1	1	1	1
Taxa	Common name																
<i>Ranunculus cf repens</i>	buttercup	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	
<i>R. sceleratus</i>	celery-leaved crowfoot	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	
<i>Rubus fruticosus</i> agg.	bramble	-	-	-	-	+	-	+	-	-	-	-	-	-	-	-	
<i>Cornus sanguinea</i>	dogwood	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	
<i>Oenanthe aquatica</i> sp.	water dropwort	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	
<i>Polygonum hydropiper</i>	water-pepper	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	
<i>Rumex</i> sp.	dock	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	
<i>Urtica dioica</i>	stinging nettle	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	
<i>Alnus glutinosa</i>	alder	+	+	+	+	+	-	-	++	++	+	++	-	-	-	-	
<i>A. glutinosa</i>	alder (female catkin)	-	+	+	-	-	-	-	+	+	+	-	-	-	-	-	
<i>A. glutinosa</i>	alder (bud scale)	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	
<i>Corylus avellana</i>	hazel	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Quercus</i> sp.	oak	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	
<i>Quercus</i> sp.	oak (bud scale)	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	
<i>Alisma</i> sp.	water-plantain	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	
<i>Juncus</i> spp.	rush	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	
<i>Sparganium erectum</i>	bur-reed	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	
<i>Eleocharis palustris</i>	common spikerush	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	

+ present ++common +++ abundant

Table 39 Pollen from Trench 3972TT, Rainham Marsh (ARC TAM01)

Lithology Context	Lower SC		Organic complex (lower)							Organic complex (upper)					Upper silty clays						
	15	14	13	12	12	11	11	11	10	9	8	8	8	7	6	5	4	4	3	2	2
Trees and shrubs																					
<i>Betula</i>	-	-	-	1	-	1	3	1	-	-	-	-	-	1	-	13	5	1	-	1	
<i>Pinus</i>	-	-	1	1	1	-	1	-	-	-	2	-	5	3	3	1	-	11	1	4	2
<i>Ulmus</i>	3	3	3	1	3	3	-	1	-	-	12	2	-	1	1	1	-	-	-	1	
<i>Quercus</i>	63	59	20	73	73	73	76	57	17	37	40	12	28	29	27	12	68	10	-	21	12
<i>Tilia</i>	3	1	5	1	8	2	6	2	-	-	5	-	1	-	1	1	10	1	-	3	1
<i>Fraxinus</i>	1	1	-	3	2	2	4	-	1	-	4	-	-	1	-	-	-	-	-	-	-
<i>Ilex aquifolium</i>	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-
Sorbus-type	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Frangula alnus</i>	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Rhamnus cathartica</i>	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Corylus avellana</i> -type	27	31	11	18	8	22	12	-	4	7	24	21	9	11	12	6	5	-	1	15	10
<i>Viburnum</i>	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Herbs																					
<i>Ranunculus</i> -type	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	2	-	-	-	-
<i>Sinapis</i> -type	-	1	-	-	-	-	-	-	-	-	-	-	-	1	1	-	17	1	7	4	-
<i>Hornungia</i> -type	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Chenopodium</i> -type	1	-	-	-	-	-	-	-	-	1	6	7	3	8	17	1	1	4	1	9	14
Fabaceae undiff.	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Filipendula</i>	-	1	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-
<i>Potentilla</i> -type	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
<i>Hedera</i>	1	1	-	-	-	1	-	-	-	1	2	-	-	-	-	-	-	-	-	-	-
Apiaceae	-	-	1	-	-	4	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-
Polygonaceae undiff.	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
<i>Rumex</i>	-	-	-	-	-	-	1	-	-	-	-	1	-	1	-	-	-	-	-	-	-
<i>Urtica</i> -type	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
<i>Armeria</i> 'A' line	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-
<i>Plantago lanceolata</i>	-	-	-	-	-	-	-	-	-	-	-	2	1	5	5	-	5	2	-	-	-
<i>Galium</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
<i>Succisa</i> -type	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
<i>Aster</i> -type	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	1	-	-	-	-	-
<i>Artemisia</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
<i>Centaurea nigra</i> -type	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Lactucoideae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	3	63	3	6
Poaceae	3	4	1	-	-	2	1	-	-	1	1	17	15	23	30	58	2	26	26	8	28
<i>Cerealia</i> -type	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	1
Large Poaceae	-	-	-	-	-	-	-	-	-	-	-	1	1	1	-	1	-	-	-	-	-
Unident/degraded	1	-	1	-	3	-	-	2	-	1	-	2	5	1	-	-	-	6	-	8	9
Marsh																					
<i>Alnus</i>	106	309	316	520	102	253	242	202	85	107	836	32	31	12	55	32	101	12	1	25	9
<i>Salix</i>	-	-	-	2	2	-	1	3	-	-	1	-	-	-	3	9	-	-	-	-	-
<i>Lythrum salicaria</i>	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Myriophyllum spicatum</i> cf <i>Lemma</i>	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Potamogeton</i>	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
<i>Iris</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-
<i>Typha latifolia</i> -type	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Typha angustifolia</i> -type	-	-	1	-	-	-	-	-	1	4	-	5	4	30	1	3	-	7	-	1	1
Cyperaceae	-	-	-	5	16	9	1	-	-	-	4	37	28	17	22	52	14	11	26	4	12
Spores																					
<i>Equisetum</i>	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
<i>Osmunda regalis</i>	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-
<i>Pteridium aquilinum</i>	-	-	-	-	-	-	-	1	-	-	-	19	85	-	48	70	-	24	5	13	14
<i>Dryopteris</i> -type	-	2	-	43	53	11	36	16	3	3	2	16	5	-	44	130	65	22	23	30	15
<i>Polypodium vulgare</i>	-	-	-	-	1	1	-	2	-	4	1	1	-	-	-	2	-	-	-	-	1
<i>Sphagnum</i>	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	2
Misc																					
<i>Pediastrum</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1
Zygnemataceae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-
Hystrichospheres	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	1	1	3
Pre-Quaternary	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	8	2	14	32

Table 40 Insects from Trench 3972TT, Rainham Marsh (ARC TAM01)

Lithology	Organic complex (lower)		Organic complex (upper)
	Context	12	11
Sample	107	117	140
Weight of sediment (kg)	1	1	1
Coleoptera			
<i>Helophorus</i> sp. (<i>brevipalpis</i> size)	-	-	+
<i>Ochthebius</i> cf <i>minimus</i>	+	-	+
<i>Anobium</i> cf <i>Punctatum</i>	+	-	-
<i>Donacia</i> sp.	-	-	+
<i>Plateumaris sericea</i>	-	-	+
<i>Donacia</i> or <i>Plateumaris</i> sp.	-	-	+
<i>Prasocuris phellandrii</i>	-	-	+
<i>Agelastica alni</i>	-	+	-
<i>Apion</i> sp.	-	-	+
<i>Ceutorhynchus erysimi</i>	-	-	+
Other Insects			
Trichoptera larva indet.	-	-	+

+ present

Table 41 Ostracods and foraminifera from Trench 3972TT, Rainham Marsh (ARC TAM01)

Lithology	Organic complex		Upper silty clays			
	Context	8	5	4	3	2
Sample	140	148	149	152	153	155
Weight of sediment (kg)	0.2	0.2	0.2	0.2	0.2	0.2
Brackish water ostracods						
<i>Cyprideis torosa</i>	-	++	++	-	+	+++
<i>Loxoconcha elliptica</i>	-	+	-	+	++	++
<i>Cytherura gibba</i>	-	-	-	-	+	-
<i>Leptocythere porcellanea</i>	-	-	-	+	++	++
<i>Leptocythere castanea</i>	-	-	-	-	+	-
Freshwater ostracods						
<i>Cypria ophthalmica</i>	++	-	-	-	-	-
<i>Candona</i> spp.	-	-	-	-	+	-
<i>Limnocythere inopinata</i>	-	-	-	-	+	-
Foraminifera						
<i>Haynesina germanica</i>	-	-	+	-	+	-
<i>Ammonia limmetes</i>	-	-	-	-	-	+
<i>Elphidium williamsoni</i>	-	-	-	-	+	-

+ present (a few specimens) ++ common +++ abundant

Table 42 Waterlogged plant remains from Chainage 26.535km and 26.540km, Wennington Marsh (ARC 36100)

Chainage	Lithology	26.535km		26.54km		
		Peat	UCS	Ditch 253		
Context	236	233	257	256	255	
Sample	369	373	397	398	399	
Weight of sediment (kg)	1	1	1	1	1	
Taxa	Common name					
<i>Ranunculus</i> cf <i>repens</i>	buttercup	+	-	-	-	-
<i>Alisma</i> sp.	water-plantain	-	-	-	+	-
<i>Juncus</i> spp.	rush	-	+	-	-	-
<i>Lemna</i> sp.	duckweed	-	-	+	+	+
<i>Typha</i> sp.	reedmace	-	+	+	-	+

+ present ++ common +++ abundant

Table 43 Pollen from Chainage 26.535km and 26.54km, Wennington Marsh (ARC 36100)

Chainage Lithology context	26.535km							26.54km						
	Peat			Upper silty clays				Ditch 253				Upper SC		
	236	236	235	235	234	232	232	257	256	255	254	254	252	250
Trees and shrubs														
<i>Betula</i>	1	3	1	-	3	-	1	-	1	-	3	-	-	1
<i>Pinus</i>	2	-	6	6	5	-	3	1	2	3	3	3	2	4
<i>Picea</i>	-	-	-	-	1	-	-	-	-	-	-	-	-	-
<i>Ulmus</i>	-	-	-	-	-	-	5	-	1	-	-	-	-	-
<i>Quercus</i>	12	9	14	7	21	3	25	22	2	20	8	9	9	12
<i>Tilia</i>	1	-	-	2	1	-	1	1	-	-	-	-	-	-
<i>Fraxinus</i>	-	-	-	-	-	-	1	-	-	-	-	-	-	-
<i>Carpinus betulus</i>	-	-	-	-	-	-	1	-	-	-	-	-	-	-
<i>Rhamnus cathartica</i>	1	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Corylus avellana</i> -type	10	14	20	9	16	5	24	8	3	10	5	3	3	13
<i>Viburnum</i>	-	-	-	1	-	-	-	-	-	1	-	-	-	-
Herbs														
<i>Ranunculus</i> -type	1	-	-	-	-	-	-	1	-	-	-	-	-	1
<i>Sinapsis</i> -type	-	1	-	23	-	25	5	12	7	7	13	25	63	5
<i>Hornungia</i> -type	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Malvaceae	-	-	-	1	-	-	-	-	-	-	-	-	-	-
<i>Dianthus</i> -type	-	-	-	-	-	-	1	-	-	-	1	-	-	-
<i>Chenopodium</i> -type	8	1	18	19	16	23	6	17	11	20	15	11	9	11
<i>Filipendula</i>	-	1	-	-	-	-	-	-	-	-	-	-	-	-
<i>Trifolium</i> -type	-	-	-	-	-	-	-	-	-	-	-	-	-	1
<i>Hedera helix</i>	1	-	-	-	1	-	-	-	-	-	-	-	-	-
Apiaceae	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Scrophulariaceae	-	-	-	-	-	-	-	1	-	1	-	-	-	-
<i>Pedicularis</i>	-	1	-	-	-	-	-	-	-	-	-	-	-	-
<i>Plantago lanceolata</i>	-	1	-	-	-	-	2	-	-	-	-	-	-	2
<i>Galium</i>	1	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Valeriana officinalis</i>	-	-	-	-	-	-	-	-	-	-	-	1	-	-
<i>Bidens</i> -type	1	-	1	-	-	-	2	-	-	-	-	-	-	-
<i>Aster</i> -type	-	-	-	-	-	-	1	-	-	-	-	-	-	4
<i>Anthemis</i> -type	-	-	-	-	-	-	2	-	-	-	1	-	-	-
<i>Cirsium</i> -type	1	-	-	1	-	-	-	-	-	-	-	-	1	-
<i>Artemisia</i>	1	-	1	-	1	-	-	-	-	-	-	-	-	1
<i>Centaurea</i> sp.	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Lactucoideae	10	3	5	7	5	15	1	3	11	1	13	17	5	5
Poaceae	48	38	25	28	30	17	16	30	34	24	28	29	9	34
<i>Cerealia</i> -type	-	1	2	-	-	1	3	-	1	-	5	2	1	3
Large Poaceae	-	1	-	-	-	-	-	1	1	3	4	-	-	-
Unident/degraded	-	-	1	-	1	8	3	2	2	1	2	1	-	1
Marsh														
<i>Alnus</i>	86	26	11	9	17	13	54	10	23	14	19	7	17	28
<i>Salix</i>	1	-	-	-	-	-	-	-	-	-	-	1	-	-
<i>Myriophyllum spicatum</i>	-	-	-	-	-	-	1	-	-	-	-	-	-	-
<i>Alisma</i> -type	-	1	-	-	-	-	-	-	-	-	-	-	1	-
<i>Potamogeton</i>	1	-	2	-	-	-	1	-	-	-	-	-	-	-
<i>Typha latifolia</i>	-	-	3	-	-	-	-	-	-	1	5	-	-	-
<i>Typha angustifolia</i> -type	3	-	2	1	-	1	5	-	1	-	-	-	-	3
Cyperaceae	40	32	35	14	5	10	4	24	27	12	5	3	6	8
Spores														
<i>Equisetum</i>	-	-	-	-	-	-	-	-	1	-	-	-	-	-
<i>Pteridium aquilinum</i>	26	19	23	23	18	13	5	21	6	16	20	-	-	6
<i>Dryopteris</i> -type	128	356	30	22	21	20	11	36	121	63	75	31	34	9
<i>Polypodium vulgare</i>	-	2	-	-	-	1	-	-	1	-	1	1	1	1
<i>Osmundaregalis</i>	-	-	-	-	-	-	-	-	-	1	-	-	-	-
<i>Sphagnum</i>	-	-	-	-	-	-	2	-	-	-	-	1	-	1
Liverworts	-	2	-	-	-	1	-	1	-	-	-	-	1	-
Misc														
<i>Pediastrum</i>	-	-	2	1	3	-	10	1	-	-	-	-	-	-
Zygnemataceae	-	7	-	1	-	-	-	-	-	1	1	-	-	-
Hystrichospheres	-	-	-	1	2	-	-	1	-	-	-	1	1	-
Pre-Quaternary	-	-	2	9	19	-	5	6	-	2	-	1	4	11

Table 44 Ostracods and foraminifera from Chainage 26.535km and 26.54km, Wennington Marsh (ARC 36100)

Chainage	26.535km						26.54km							
	Upper silty clays						Sand	Ditch 253				Upper SC		
Lithology	235	235	234	233	232	232	248	257	256	255	254	254	252	250
Context	235	235	234	233	232	232	248	257	256	255	254	254	252	250
Sample	370	371	372	373	374	376	394	395	395	395	396	396	396	396
Weight of sediment (kg)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Brackish water ostracods														
<i>Cyprideis torosa</i>	++	+++	-	+	+++	+++	+++	++	+	++	+	-	+	++
<i>Loxococoncha elliptica</i>	-	-	-	++	+	+	-	-	-	-	+	+	+	++
<i>Cytherura gibba</i>	+	-	-	++	-	-	+	+	-	-	-	-	-	++
<i>Leptocythere porcellanea</i>	+	++	-	-	+++	++	-	-	-	-	-	-	+	++
<i>Leptocythere castanea</i>	-	-	-	-	+	-	-	-	-	-	-	-	-	-
Marine ostracods														
<i>Pontocythere elongata</i>	-	-	-	-	+	-	+	-	-	-	-	-	-	-
Freshwater ostracods														
<i>Candona</i> spp.	+	+	-	+	-	-	-	-	-	-	-	-	-	-
<i>Cypria ophthalmica</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Heterocypris salina</i>	-	+	-	-	-	-	+	+	-	-	-	-	-	-
<i>Limnocythere inopinata</i>	-	-	-	-	-	-	+	-	-	-	-	-	-	-
<i>Ilyocypris</i> sp.	-	-	-	-	-	-	+	-	-	-	-	-	-	-
<i>Pseudocandona</i> sp.	-	-	-	+	-	-	+	-	-	-	-	-	-	-
Foraminifera														
<i>Haynesina germanica</i>	++	+	-	+	+	+	+	++	-	+	-	-	-	++
<i>Ammonia limnetes</i>	+	+	-	+	+	+	+	++	-	+	-	-	-	+
<i>Elphidium williamsoni</i>	++	-	-	+	++	-	+	++	-	+	-	-	-	+
<i>Elphidium margaritaceum</i>	+	-	-	-	-	-	-	+	-	-	-	-	-	+
<i>Lagena</i> spp.	+	-	-	-	-	-	-	+	-	+	-	-	-	-
<i>Glabratella millettii</i>	-	+	+	-	-	-	-	-	-	-	-	-	-	-

+ present (a few specimens) ++ common +++ abundant

Table 45 Waterlogged plant remains from Chainage 26.8km and 27.46km, Wennington Marsh (ARC 36100)

	Chainage	26.8km			27.46km		USC
		LCS	Peat		Peat		
	Lithology	274	273	273	272	271	269
	Context	405	403	402	428	429	431
	Sample	1	1	1	1	1	1
	Weight of sediment (kg)	1	1	1	1	1	1
Taxa	Common name						
<i>Rubus fruticosus</i> agg.	blackberry	-	-	+	+	+	-
<i>Potentilla anserina</i>	silverweed	-	-	-	-	-	++
<i>Urtica dioica</i>	stinging nettle	-	-	-	+	-	-
<i>Alnus glutinosa</i>	alder	++	-	++	-	-	-
<i>A. glutinosa</i>	alder (female catkin)	+	-	+	-	-	-
<i>Corylus avellana</i>	hazel	-	-	-	-	+	-
<i>Quercus</i> sp.	oak (bud scale)	-	+	-	-	-	-
<i>Populus</i> sp.	poplar (bud scale)	-	-	-	+	-	-
<i>Lycopus europaeus</i>	gipsy-wort	-	-	-	+	-	-
<i>Juncus</i> spp.	rush	-	-	-	-	-	+
<i>Carex</i> spp.	sedge	-	-	-	+	-	-

+ present ++ common +++ abundant

Table 46 Insects from Chainage 26.8km and 27.46km, Wennington Marsh (ARC 36100)

	Chainage	26.8km	27.460km
		LCS	Peat
	Lithology	274	272
	Context	405	428
	Sample	1	1
	Weight of sediment (kg)	1	1
Coleoptera			
	<i>Ochthebius cf minimus</i>	+	+
	<i>Hydraena testacea</i>	+	-
	<i>Stenus</i> sp.	+	-
	<i>Agelastica alni</i>	+	-
	<i>Dryocoetinus alni</i>	+	-

+ present

Table 47 Pollen from Chainage 26.8km and 27.46km, Wennington Marsh (ARC 36100)

Chainage Lithology Context	26.8km				Peat				27.46km				Upper silty clays			
	Org SC 274	273	Peat 273	273	272	272	272	271	270	269	269	268	268	268		
Trees and shrubs																
<i>Betula</i>	1	3	-	-	1	-	-	-	1	-	1	3	3	1		
<i>Pinus</i>	4	-	1	1	3	-	-	1	2	-	2	1	3	6		
<i>Picea</i>	-	-	-	-	-	-	-	-	-	-	-	-	1	-		
<i>Taxus baccata</i>	-	-	-	-	-	-	-	2	-	-	-	-	-	-		
<i>Ulmus</i>	3	-	-	1	1	-	-	-	-	-	-	13	4	-		
<i>Quercus</i>	42	63	74	72	35	25	21	32	8	4	13	26	26	9		
<i>Tilia</i>	5	8	6	4	1	4	7	9	1	2	-	2	1	-		
<i>Fraxinus</i>	-	-	-	-	1	1	1	-	-	-	-	3	-	-		
cf <i>Populus</i>	-	-	-	1	-	-	-	-	-	-	-	-	-	-		
<i>Sorbus</i> -type	-	-	1	-	-	-	-	-	-	-	-	-	-	-		
<i>Prunus</i> -type	-	-	-	-	-	-	1	-	-	-	-	-	-	-		
<i>Corylus avellana</i> -type	23	19	14	22	12	12	3	24	4	-	1	19	15	3		
<i>Erica</i>	-	-	-	-	-	-	-	-	-	-	-	-	1	-		
Herbs																
<i>Ranunculus</i> -type	-	-	-	-	-	-	-	-	-	-	-	-	-	1		
<i>Sinapsis</i> -type	-	-	-	-	-	-	-	-	11	1	-	-	1	3		
cf <i>Hypericum</i>	-	-	-	-	-	-	-	-	-	-	-	-	1	-		
Malvaceae	-	-	-	-	-	-	-	-	1	-	-	-	-	-		
<i>Spergula</i> -type	-	-	-	-	-	-	-	-	1	-	-	-	-	1		
<i>Chenopodium</i> -type	11	-	-	1	-	-	-	1	-	-	3	9	7	12		
<i>Trifolium</i> -type	-	-	-	-	-	-	-	-	-	-	2	-	-	-		
Rosaceae	-	-	1	-	-	-	-	-	-	1	-	-	-	-		
<i>Filipendula</i>	-	-	1	-	-	-	-	-	-	-	-	-	-	-		
<i>Filipendula ulmaria</i>	-	-	-	-	-	-	1	-	-	-	-	-	-	-		
<i>Hedera helix</i>	-	-	-	-	-	-	1	-	-	-	-	-	-	-		
Apiaceae	-	1	2	-	-	-	-	-	-	1	-	-	1	-		
<i>Mercurialis</i>	-	-	-	-	-	-	-	1	-	-	-	-	-	-		
<i>Polygonum</i> sp.	-	-	-	-	-	-	-	-	-	-	1	-	-	-		
<i>Rumex</i>	-	-	-	-	-	-	-	1	-	-	1	-	-	-		
<i>Cynoglossum</i>	-	-	-	-	-	-	-	-	-	-	1	-	-	-		
Scrophulariaceae	-	-	-	-	-	-	-	1	-	1	-	-	-	-		
<i>Plantago major</i> -type	-	-	-	-	-	-	-	1	-	-	-	-	-	-		
<i>Plantago lanceolata</i>	3	-	-	-	1	-	-	-	-	-	-	-	-	3		
<i>Plantago coronopus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	1		
<i>Lysimachia</i>	1	-	-	-	-	-	-	-	-	-	-	-	-	-		
<i>Bidens</i> -type	-	-	-	-	-	-	-	-	-	1	-	-	-	-		
<i>Aster</i> -type	-	-	-	-	-	-	-	-	-	-	-	3	1	-		
<i>Anthemis</i> -type	-	-	-	-	-	-	-	-	-	-	-	-	-	1		
<i>Cirsium</i> -type	-	-	-	-	-	-	-	-	-	1	1	-	-	-		
<i>Centaurea nigra</i> -type	-	-	-	-	-	-	-	-	-	-	-	-	1	-		
<i>Centaurea scabiosa</i> -type	-	-	-	-	-	-	-	-	-	1	-	-	-	-		
Lactucoideae	-	-	-	-	-	-	5	-	41	7	-	1	3	-		
Poaceae	6	-	-	1	25	4	6	16	28	48	56	32	35	35		
Cereal-type	-	-	-	-	-	-	-	-	3	-	-	-	4	6		
Large Poaceae	-	-	-	-	-	-	-	1	1	-	6	1	-	-		
Unident/degraded	1	-	1	1	-	2	-	2	2	-	-	-	-	-		
Marsh																
<i>Alnus</i>	123	73	105	148	20	52	65	116	13	4	2	86	14	18		
<i>Salix</i>	-	9	-	1	-	-	-	-	-	-	-	1	-	-		
<i>Caltha</i> -type	-	-	-	-	-	-	-	-	-	-	-	1	-	-		
<i>Potamogeton</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	1		
<i>Lemma</i>	-	-	-	-	-	-	-	-	-	-	-	1	-	-		
cf <i>Callitriche</i>	-	-	-	-	-	1	-	-	-	-	-	-	-	-		
<i>Typha angustifolia</i> -type	-	-	-	1	1	-	-	1	-	-	-	-	3	3		
Cyperaceae	-	16	33	10	48	2	3	17	15	62	22	6	7	8		
Spores																
<i>Equisetum</i>	-	-	-	-	-	-	-	-	-	1	1	-	-	-		
<i>Pteridium aquilinum</i>	1	3	1	2	10	3	-	-	1	10	12	7	8	4		
<i>Thelypteris palustris</i>	-	11	-	-	-	1	-	-	-	-	-	-	-	-		
<i>Dryopteris</i> -type	11	114	16	24	129	9	19	0	33	24	6	21	29	14		
<i>Polypodium vulgare</i>	1	4	3	3	4	0	1	0	1	0	0	0	0	1		
<i>Sphagnum</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Liverworts	0	0	0	0	9	0	0	0	0	0	0	0	0	0		
Misc																
<i>Pediastrum</i>	0	0	0	0	0	0	0	0	1	0	0	0	0	1		
Zygnemataceae	0	0	2	0	5	0	0	0	1	0	1	0	0	0		
Hystriochspheres	1	0	0	0	0	0	0	0	0	0	0	0	5	4		
Pre-Quaternary	0	0	0	0	0	0	0	0	2	0	0	0	2	5		

Table 48 Ostracods and foraminifera from Chainage 27.46km, Wennington Marsh (ARC 36100)

Lithology	Upper silty clays				
	Context	270	268	268	268
	Sample	430	432	434	436
Brackish water ostracods					
<i>Cyprideis torosa</i>	++	++	++	+++	
<i>Loxoconcha elliptica</i>	-	++	++	++	
<i>Cytherura gibba</i>	-	+	-	-	
<i>Leptocythere porcellanea</i>	-	-	+	-	
Freshwater ostracods					
<i>Limnocythere inopinata</i>	-	-	-	+	
<i>Cyclocypris</i> sp.	-	-	+	-	
Foraminifera					
<i>Haynesina germanica</i>	-	++	++	++	
<i>Ammonia limnetes</i>	+	+	+	+	
<i>Elphidium williamsoni</i>	-	+	+	+	
<i>Lagena</i> spp.	-	+	-	-	

+ present (a few specimens) ++ common +++ abundant

Table 49 The worked flint assemblage from Rainham Marsh (ARC 36100)

Category type	Context	
	192	193
Flake	30	1
Sieved chips 10–4mm	31	-
Rejuvenation flake core face/edge	1	-
Tested nodule/bashed lump	1	-
Core on a flake	1	-
Microolith	1	-
Total	65	1
Burnt unworked flint No./wt (g)	103/459	1/34
No. burnt worked flints (%)*		1
No. broken worked flints (%)*	3 (8.8)	
No. retouched flints (%)*	1 (2.9)	

*percentage excludes chips

Table 50 Roman pottery from context 194, Rainham Marsh (ARC 36100)

Fabric*	Count	Weight
'Early' shell-tempered ware (B6)	26	74
Flint-tempered ware (no code)	4	23
Sandy grey ware (R7)	7	11
Grog-tempered ware (B2/B5)	7	10
Unidentified (no code)	2	4
'Upchurch'-type oxidised ware (R17)	1	1
Total	47	123

*Fabric code from the Canterbury Archaeological Trust

Table 51 Medieval and post-medieval pottery from Wennington Marsh

Context	SHEL		EMSS		Micaceous		Sandy		LOND		KING		MG		RE		Date
	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	
U/S	-	-	-	-	-	-	2	2	2	7	-	-	1	5	4	27	U/S
234	-	-	-	-	-	-	-	-	-	-	1	28	-	-	-	-	L13C
239	-	-	2	14	-	-	-	-	-	-	-	-	2	26	-	-	L13C
240	8	99	3	16	-	-	-	-	1	56	-	-	1	1	-	-	M12C
252	-	-	-	-	-	-	2	8	-	-	-	-	-	-	3	24	16C
254	-	-	1	12	-	-	42	255	-	-	-	-	1	1	-	-	L13C
256	-	-	1	8	-	-	-	-	-	-	-	-	-	-	-	-	E11C
257	-	-	-	-	1	87	-	-	-	-	-	-	-	-	-	-	12C
Total	8	99	7	50	1	87	46	265	3	63	1	28	5	33	7	51	

Table 52 Charred plant remains from Wennington Marsh (ARC 36100)

		Context	252	254	255	256	257
		Sample	401	400	399	398	397
Taxa	Common name						
<i>Hordeum</i> sp. – hulled grain	hulled barley		-	-	+	+	-
<i>Avena</i> sp. – grain	oats		-	-	+	-	-
cereal indet. – grain			+	+	+	+	-
<i>Avena</i> sp. – awn	oats		+	-	-	-	-
<i>Chenopodium album</i> – seed	fat hen		-	-	+	-	-
<i>Galium aparine</i> – seed	goosegrass		-	-	+	-	-
<i>Anthemis cotula</i> – seed	stinking mayweed		-	+	-	-	-
Gramineae indet. – seed	grass		-	-	+	-	-

+ present

Table 54 Waterlogged plant remains from Chainage 28.517km, Aveley Marsh (ARC 36100)

		Lithology	LCS	Peat	Organic silts and clay			Upper SC		
		Context Number	379	378	377	376	376	375	374	373
		Sample Number	532	533	534	536	537	538	539	540
		Volume of sediment (litres)	1	1	1	1	1	1	1	1
		Proportion scanned (%)	30	30	30	30	100	100	100	100
Taxa	Common name									
<i>Taxus baccata</i>	yew		-	-	-	+	-	-	-	-
<i>Caltha palustris</i>	marsh-marigold		-	-	-	+	-	-	-	-
<i>Ranunculus repens/R. acris/R. bulbosus</i>	creeping/meadow/ bulbous buttercup		-	-	+	++	-	-	-	-
<i>Ranunculus</i> subg. <i>Ranunculus</i>	buttercup		-	+	+	-	-	-	-	-
<i>Fagus sylvatica</i> – mast fragment	beech		-	-	-	+	-	-	-	-
<i>Alnus glutinosa</i> – seed	alder		-	++	++	+++	-	-	-	-
<i>Alnus glutinosa</i> – intact inflorescence	alder		-	-	+	-	-	-	-	-
<i>Alnus glutinosa</i> – stalk of inflorescence	alder		-	+++	+	++	+	-	-	++
<i>Alnus cf glutinosa</i> – stalk of inflorescence	possible alder		-	+	-	-	-	-	-	-
<i>Polygonum hydropiper</i>	water-pepper		-	-	+	-	-	-	-	-
<i>Brassica cf nigra</i>	black mustard		-	-	-	+	-	-	-	-
<i>Rubus</i> subg. <i>Rubus</i> section 1 <i>Rubus</i>	bramble		-	+	+	-	-	-	-	-
<i>Mentha</i> sp. – possible aquatic type	mint (possible water mint)		-	-	+	-	-	-	-	-
<i>Solanum</i> sp.	nightshades		-	+	+	-	-	-	-	-
cf <i>Scripus sylvaticus</i>	possible wood club-rush		-	+	-	-	-	-	-	-
cf <i>Iris pseudacorus</i> – fragment	yellow iris		-	-	+	-	-	-	-	-
Unidentified bud	bud		-	+	-	+	-	-	-	-
Unidentified bud scar	bud scar		-	++	+	++	++	-	-	-
Unidentified moss fragments	moss fragments		-	-	-	+	-	-	-	-
Unidentified wood fragments	wood fragments		++++	-	-	-	++++	++	++	+

+ < 3 ++ 3–9 +++ 10–25 ++++ >25

Table 56 Summary of main lithological units identified in Stage I Thames River Crossing investigation

Unit Number	Stratigraphic description	Inferred environment of deposition	Age ascription	Archaeological and palaeoenvironmental potential
X	5Y 3/2 dark olive grey slightly organic clay-silt. Structureless and moderately firm. Modern roots present. Laterally this may include some or significant quantities of recent material	Topsoil/made ground	Recent	Low
IX	5Y 5/2 olive grey clay-silt with 7.5YR 4/4 dark brown mottles. Very firm and compact. Occasional small, sub-rounded clasts (<3mm). Modern roots This unit also includes sediments that are 10YR 6/4 light yellowish brown clay-silt becoming 5Y 5/1 grey with depth. Strong 7.5YR 4/4 dark brown mottles. Structureless and massive. Very firm becoming softer with depth. Occasional plant fragments present Deposit may also contain 10YR 3/2 very dark grey organic silt becoming a 10YR 2/1 black woody peat with depth. Moderately firm and compact. Structureless. Well preserved wood and root fragments. Very well humified ground mass	This sequence is indicative of deposition within intertidal or upper-tidal mudflat situations (clay-silt dominated zones) alternating with periods of organic accumulation in saltmarsh surface zones. Rooted horizons and weathered surfaces within sequences suggest periodic drying of areas and pedogenic activity	< 1500 cal BC	Archaeological artefacts discovered within these fine grained sediments are unlikely to have been transported any distance due to the fine grained nature of the substrate. The presence of surfaces may be indicative of horizons on which occupation may have occurred Palaeoenvironmental material may exist within these contexts. Better preservation may exist of pollen/plant fragments within organic sub-units
VIII	Black to very dark brown reed peat containing moderately well preserved reed fragments. Slightly pliable and plastic Can vary to dark brown laminated peat or organic silt. With common reed fragments. Relatively soft and unconsolidated. Bedded with 1–2mm thick laminae of sub-parallel aspect. Locally wood peat also present. A noticeable clay-silt horizon (20–20cm thick in places) is present within some peat sequences	Freshwater or saltmarsh reed swamp. Locally alder carr wetland may also be present Clay-silt horizon within peat may be indicative of local channelling or the presence of a short lived phase of tidal channel activity	c 4000– 1500 cal BC	Archaeological artefacts discovered within these deposits may be <i>in situ</i> or close to <i>in situ</i> Artefacts are commonly associated with the upper surface of peats (trackways) or within the peats Palaeoenvironmental potential may be high in unhumified parts of the sequence with good plant, pollen and insect preservation
VII	Grey to dark grey clay-silt. Common black reduced organic fragments and fresher reed fragments. Laminated in places with 1–3mm thick wavy, sub-parallel laminations. Numbers of laminae increase towards base. Moderately soft and unconsolidated	Intertidal or upper tidal mudflats or channel fills	c 5900/5200– 4000 cal BC	Archaeological artefacts discovered within these fine grained sediments are unlikely to have been transported any distance due to the fine grained nature of the substrate. Some well preserved palaeoenvironmental material may exist within these contexts including pollen, plant macrofossils, foraminifera/ostracoda and diatoms.

Table 56 Continued

Unit Number	Stratigraphic description	Inferred environment of deposition	Age ascription	Archaeological and palaeoenvironmental potential
VI	5Y 2.5/1 black organic silt. Very dense and compact with reed fragments present. May also vary to a 5YR 2.5/1 black woody peat that is loose and unconsolidated. Occasional flint clasts (<2cm, angular). Structureless	? freshwater reed swamp or channel marginal infill with local trees	5900–5200 cal BC	Any artefacts found in this sequence would be <i>in situ</i> to slightly reworked artefacts. Palaeoenvironmental material may be well persevered in this sequence
V	Light blue-grey silt to sandy-silt. Very dense and compact Occasional black wood fragments. Common shell fragments. Structureless. May grade downwards into dark greenish-grey medium sand. Common shell fragments. Possibly some crude bedding noted. Gravel clasts increase with depth	Freshwater channel fills, edge channel or channel Marginal situations	>5900 cal BC	Any artefacts present may be considered to have been subject to post-depositional movement. Palaeoenvironmental potential may include pollen and ostracod remains
IV	Blue-grey bedded sands. Beds 1–2cm thick and consisting of alternating bands of medium and coarse sand. Beds and parallel and sub-horizontal. Unit is dense and compact and contains shell fragments. Chalk clasts are present and increase in frequency with depth. Locally coarser gravel units may exist	High energy braided channel environments	10–15ka BP	Considerable post-depositional transportation may have occurred to any artefacts. Palaeoenvironmental potential is low
III	5Y 5/2 olive grey silty and. Very firm and compact. Structureless and massive. Occasional roots noted (1–3mm wide). Grades downward into more silty deposit with some gravel. Becomes 5G 5/1 greenish-grey colour 5G 4/1 dark greenish-grey medium to coarse sand with flint and chalk clasts. Chalk becomes very coarse towards base of unit. Clearly bedded in places	High energy braided channel environments	>25ka BP	Considerable post-depositional transportation may have occurred to any artefacts. Palaeoenvironmental potential is low
II	Angular chalk rubble and chalky paste matrix. Moderately dense and compact	Periglacial solifluction or <i>in situ</i> weathering and breakup of chalk	>10ka BP	Low archaeological and palaeoenvironmental potential
I	Fresh, dense clean chalk	Tropical sea	65mya	None

Table 57 Diatoms from Borehole BH3751

Lithology	Organic silt	LCS	Peat						Upper clay silts				
			m OD	-8.53	-8.43	-4.81	-4.57	-4.47	-4.35	-3.53	-3.29	-3.19	-0.72
Polyhalobous													
<i>Biddulphia aurita</i>	-	-	-	-	-	-	-	-	-	-	+	-	-
<i>Cymatosira belgica</i>	-	-	-	-	-	-	-	-	-	-	-	-	+
<i>Paralia sulcata</i>	-	+	-	-	-	-	-	-	-	-	++	+	++
<i>Podosira stelligera</i>	-	-	-	-	+	-	-	-	-	-	-	-	-
<i>Rhaphoneis</i> sp.	-	-	-	-	-	-	-	-	+	+	-	-	+
<i>Rhaphoneis minutissima</i>	-	-	-	-	-	-	-	-	-	-	-	-	+
<i>Rhaphoneis surirella</i>	-	-	-	-	-	-	-	-	+	+	-	-	+
<i>Thalassionema nitzschiodes</i>	-	-	-	-	-	-	-	+	-	+	-	-	-
Polyhalobous to mesohalobous													
<i>Diploneis smithii</i>	-	-	-	-	-	-	-	-	-	-	-	+	++
<i>Navicula flanatica</i>	-	-	-	-	-	-	-	-	-	+	-	-	-
<i>Thalassiosira decipiens</i>	-	-	-	-	-	-	-	-	-	+	-	-	-
Mesohalobous													
<i>Campylodiscus echeneis</i>	-	+	-	+	-	-	-	-	-	-	-	+	-
<i>Cyclotella striata</i>	-	-	+	-	-	-	-	-	+	++	-	-	-
<i>Diploneis aestuari</i>	-	-	-	-	-	-	-	-	-	+	-	-	-
<i>Diploneis didyma</i>	-	-	-	-	+	-	-	-	-	-	-	-	-
<i>Diploneis interrupta</i>	-	-	-	-	-	-	-	-	-	-	++	++	++
<i>Nitzschia granulata</i>	-	-	-	-	+	-	-	-	-	++	-	-	-
<i>Nitzschia navicularis</i>	-	+	-	+	++	-	-	-	-	++	+	+	+
<i>Nitzschia sigma</i>	-	-	-	-	-	-	-	-	-	+	-	-	-
<i>Synedra fasciculata</i>	-	+	-	-	-	-	-	-	-	+	-	-	+
Mesohalobous to halophilous													
<i>Actinocyclus normanii</i>	-	-	-	-	-	-	-	-	-	+	-	-	-
<i>Nitzschia levidensis</i>	-	-	-	-	-	-	-	-	-	+	-	-	+
Halophilous													
<i>Navicula cincta</i> (& v. <i>minor</i>)	-	-	-	-	-	-	-	-	-	-	-	+	+
<i>Navicula pusilla</i>	-	-	-	-	-	-	-	-	-	-	-	-	+
<i>Navicula slesvicensis</i>	-	-	-	-	-	-	-	-	-	-	-	+	-
Halophilous to oligohalobous indifferent													
<i>Diploneis ovalis</i>	-	-	-	-	-	-	-	-	-	-	-	+	-
<i>Gomphonema olivaceum</i>	+	-	-	-	-	-	-	-	-	-	-	-	-
Oligohalobous indifferent													
<i>Achnanthes minutissima</i>	-	-	-	-	-	-	-	-	+	-	-	-	-
<i>Amphora ovalis</i>	-	-	-	-	-	-	-	-	-	-	-	+	-
<i>Caloneis bacillum</i>	-	-	-	-	-	-	-	-	-	-	-	-	+
<i>Fragilaria pinnata</i>	-	-	-	-	-	-	-	-	-	-	-	-	+
<i>Meridion circulare</i>	+	-	-	-	-	+	-	-	-	-	-	-	-
<i>Navicula rhyncocephala</i>	-	-	-	-	-	-	-	-	-	-	++	++	+
Unknown salinity preference													
<i>Diploneis</i> sp.	-	-	-	+	-	-	-	-	-	-	-	-	-
<i>Nitzschia</i> sp.	-	-	-	-	-	-	-	-	-	-	-	+	-
<i>Pinnularia</i> sp.	-	-	-	-	-	-	-	-	-	-	-	+	-
Indeterminate centric diatom	-	+	-	+	-	-	-	-	-	-	-	-	-
Indeterminate fragment	-	-	-	+	-	-	-	-	-	-	-	-	-

+ present ++ common

Table 58 Waterlogged plant remains from Borehole BH3751

Taxa	Common name	Lithology										Upper clay silts								
		Peat and organic silt	LCS		Peat		Upper clay silts		Upper clay silts		Upper clay silts									
		m OD	-8.81 to -8.87	-8.63 to -8.73	-8.03 to -8.13	-6.13 to -6.23	-5.18 to -5.28	-4.73 to -4.83	-4.50 to -4.58	-4.38 to -4.48	-4.03 to -4.13	-3.60 to -3.70	-3.26 to -3.36	-3.03 to -3.13	-2.03 to -2.13	-1.93 to -2.03	-1.08 to -1.18	-0.98 to -1.08	-0.33 to -0.43	0.27 to 0.37
		Weight of sediment (kg)	0.208	0.217	0.245	0.416	0.638	0.418	0.251	0.191	0.285	0.327	0.300	0.603	0.333	0.402	0.200	0.427		
		Proportion of sample scanned	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	50%	50%	25%	25%	No flots
<i>Ranunculus sceleratus</i>	celery-leaved buttercup	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Urtica dioica</i>	common nettle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Alnus glutinosa</i> – seed	alder	-	++++	++	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
<i>Alnus glutinosa</i> – stalk of inflorescence	alder	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Persicaria hydropiper</i>	water-pepper	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Rumex</i> spp.	dock	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Lycopus europaeus</i>	gypsywort	-	-	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-	-
<i>Eleocharis palustris/uniglumis</i>	common/slender spike-rush	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cf <i>Eleocharis palustris/uniglumis</i>	possible common/slender spike-rush	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Bolboschoenus maritimus</i>	club rushes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+++	-	-	-	-
<i>Schoenoplectus</i> spp. cf <i>Scirpus sylvaticus</i>	possible wood club-rush	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Carex</i> spp. – 3-sided	sedge	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
Cyperaceae – unidentified	Sedge Family	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Unidentified bud	bud	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
Unidentified bud scar (most likely alder)	bud scar	-	++	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Unidentified wood fragments (most likely alder)	wood fragments	++	+++++	+++++	+	-	-	+++++	-	-	+++++	+++++	+++++	-	-	-	-	-	-	-
Unidentified vegetative fragments (most likely reed)	vegetative fragments	++++	++	+++	+	+++	++++	++++	++++	++++	++++	++++	++++	++++	++++	++++	++++	++++	++++	++++
(most likely reed and/or sedge)	vegetative fragments (most likely reed)	++++	++	+++	+	+++	++++	++++	++++	++++	++++	++++	++++	++++	++++	++++	++++	++++	++++	++++

+ 1–3 ++ 4–10 +++ 11–25 ++++ 26–50 +++++ >50

Table 59 Foraminifera and ostracods from Borehole BH3751

Lithology	m OD	FORAMINIFERA								OSTRACODS					Ecology			
		<i>Trochammina inflata</i>	<i>Jadammina macrescens</i> / <i>Haplophragmoides</i> spp.	<i>Tiphrocha comprmata</i>	<i>Ammonia</i> sp. (small)	<i>Haynesina germanica</i>	<i>Elphidium williamsoni</i>	<i>Arenoparrella mexicana</i>	<i>Cypridopsis torosa</i> (smooth)	<i>Loxconcha elliptica</i>	<i>Leptocythere porcellanea</i>	<i>Candona</i> sp. (lvs.)	<i>Cytheromorpha fuscata</i>	Weathered horizon				
Upper clay silts	0.44 to 0.39																	
	0.13 to 0.07																	
	-0.08 to -0.15																	
	-0.28 to -0.33																	
	-0.78 to -0.83																	
	-0.93 to -0.98																	
	-1.21 to -1.26	x																
	-1.61 to -1.65	xxx	xxx	x	x													
	-2.01 to -2.06																	
	-2.38 to -2.43																	
Peat	-2.83 to -2.88																	
	-3.22 to -3.27	x	x	x	x													
	-4.58 to -4.63																	
	-5.08 to -5.13																	
Lower clay silts	-5.43 to -5.48																	
	-6.03 to -6.08																	
	-6.43 to -6.48																	
	-6.93 to -6.98	xx	x															
	-7.53 to -7.58		xx															
	-7.93 to -7.98		x	x	xxx	x												
Basal peat and organic silt	-8.43 to -8.51																	
	-8.85 to -8.93																	

o – one specimen x – several specimens xx – common xxx – abundant/superabundant

Foraminifera

- Calcareous foraminifera of low-mid saltmarsh and tidal flats
- Agglutinating foraminifera of mid-high saltmarsh

Ostracods

- Brackish ostracods of tidal flats and creeks
- Freshwater ostracods (FW OS)

Table 60 Foraminifera and ostracods from Borehole BH3748

Lithology	m OD	<i>Jadammina macrescens</i>	<i>Trochammmina inflata</i>	<i>Ammonia</i> spp. (small)	<i>Elphidium williamsoni</i>	<i>Cyprideis torosa</i> (smooth)	Ecology		
							freshwater; reedbeds	mid-high saltmarsh	saltmarsh and tidal mudflats
Lower clay silts	-5.88 to -5.93						freshwater; reedbeds	tidal access	regression
	-5.98 to -6.03								
	-6.08 to -6.13								
	-6.18 to -6.23	x					mid-high saltmarsh		
	-6.28 to -6.33	x							
	-6.38 to -6.43	x					saltmarsh and tidal mudflats		
	-6.48 to -6.53	x	x	x					
	-6.58 to -6.63	x		x					
	-6.68 to -6.73		o	xx	x				
	-6.78 to -6.83			xx		x			
-6.88 to -6.93			xxx	x	x				

o – one specimen x – several specimens xx – common xxx – abundant/superabundant

Foraminifera

- Calcareous foraminifera of low-mid saltmarsh and tidal flats
- Agglutinating foraminifera of mid-high saltmarsh

Ostracods

- Brackish ostracods of tidal flats and creeks

Table 61 Insects from Borehole BH3751

Lithology	Peat		UCS
	m OD	m OD	
	-4.5 to -4.58	-4.03 to -4.13	-3.6 to -3.7
			-0.33 to -0.43

COLEOPTERA	Ecological codes				
Carabidae					
<i>Pterostichus</i> spp.	oa	-	1	-	-
Hydrophilidae					
<i>Cercyon</i> spp.	rt	-	-	-	2
<i>Chaetarthria seminulum</i> (Hbst.)	oa-w	-	2	-	-
Staphylinidae					
<i>Stenus</i> spp.	pu	-	1	-	-
<i>Philonthus</i> spp.					1
Helodidae Gen. & spp. Indet.	oa-w	-	1	-	-
Colydiidae					
<i>Aglenus brunneus</i> (Gyll.)	rt-h	-	2	-	1
Chrysomelidae					
<i>Plateumaris braccata</i> (Scop.)	oa-d	1	1	-	-
Cuculionidae					
<i>Gymnetron</i> spp.	oa-p	-	-	-	1
DIPTERA					
Muscinae					
<i>Musca domestica</i> L.		-	1	-	-

Ecological coding (after Kenward and Hall 1995):

- oa– species which will not breed in human housing
- w – aquatic species
- d – species associated with damp watersides and river banks
- rt – insects associated with decaying organic matter
- p – phytophage species often associated with waste areas or grassland and pasture
- pu – species associated with pulses (peas and beans)
- h – members of the ‘house fauna’ this is a very arbitrary group based on archaeological associations (Hall and Kenward 1990)

Table 63 Diatoms from 3880TT, Thames Crossing

Sample	Monolith 1 (420–430mm)	Monolith 2 (20–30mm)
Context Number	2	3
m OD	-0.10	-0.57
Polyhalobous		
<i>Campylosira cymbelliformis</i>	-	1
<i>Coscinodiscus</i> sp.	1	-
<i>Cymatosira belgica</i>	-	7
<i>Dimeregramma minor</i> var. <i>minor</i>	-	1
<i>Grammatophora</i> sp.	1	-
<i>Paralia sulcata</i>	3	8
<i>Podosira stelligera</i>	-	1
<i>Rhaphoneis</i> sp.	1	-
<i>Rhaphoneis amphiceros</i>	-	2
<i>Rhaphoneis minutissima</i>	-	4
<i>Rhaphoneis surirella</i>	-	4
Polyhalobous to Mesohalobous		
<i>Actinoptychus undulatus</i>	-	1
<i>Diploneis smithii</i>	4	-
<i>Synedra gaillonii</i>	-	1
Mesohalobous		
<i>Achnanthes delicatula</i>	1	-
<i>Caloneis westii</i>	1	-
<i>Cyclotella striata</i>	3	3
<i>Diploneis interrupta</i>	2	-
<i>Fragilaria cf schulzi</i>	-	1
<i>Navicula peregrina</i>	1	-
<i>Nitzschia granulata</i>	2	-
<i>Nitzschia navicularis</i>	11	4
Halophilous		
<i>Navicula cincta</i>	-	2
<i>Navicula mutica</i>	-	1
Unknown Salinity Preference		
<i>Diploneis</i> sp.	3	-
<i>Navicula</i> sp.	1	-
<i>Nitzschia</i> sp.	1	-
Unknown Naviculaceae	1	1

Table 64 The flint assemblages from the Thames Crossing excavation and watching brief by context

Category type	Watching brief (ARC 32001)					3880TT (ARC TMS00)		Grand Total
	0	1	2	3	11	388004	388006	
Flake	3	2	1	105	80	28	30	249
Blade	1	-	4	36	15	6	5	67
Bladelet	-	-	-	4	6	2	1	13
Blade-like	1	-	2	20	16	5	8	52
Irregular waste	-	-	1	1	1	1	5	9
Sieved chips 10-4mm	-	-	-	-	-	37	17	54
Rejuvenation flake core face/edge	-	-	-	-	1	-	1	2
Rejuvenation flake tablet	-	-	-	3	-	-	-	3
Rejuvenation flake other	-	-	-	5	-	-	1	6
Janus flake (= thinning)	-	-	5	-	-	-	-	5
Thinning flake	-	-	-	-	1	-	-	1
Flake from ground implement	-	-	-	-	1	-	-	1
Core single platform blade core	-	-	-	2	-	-	-	2
Bipolar (opposed platform) blade core	1	-	-	-	1	2	2	6
Other blade core	-	-	-	1	-	-	-	1
Tested nodule/bashed lump	-	-	-	1	-	1	1	3
Single platform flake core	-	-	-	1	2	-	-	3
Multiplatform flake core	1	-	-	1	3	-	-	5
Keeled non-discoidal flake core	-	-	-	-	1	-	1	2
Levallois/other discoidal flake core	-	-	-	-	1	-	-	1
Unclassifiable/fragmentary core	-	-	-	-	-	-	2	2
Core on a flake	-	-	-	-	1	-	-	1
Microlith	-	-	-	-	-	-	-	0
Burin	-	-	-	3	2	-	-	5
Burin spall	-	-	-	-	-	2	3	5
Laurel leaf	-	-	-	-	1	-	-	1
Unfinished arrowhead/blank	-	-	-	-	-	1	-	1
End scraper	-	-	-	4	1	-	5	10
Serrated flake	-	-	-	-	1	-	-	1
Notch	-	1	-	4	-	-	-	5
Backed knife	-	-	-	-	1	-	-	1
Backed blade	-	-	-	-	-	-	1	1
Retouched flake	-	-	-	2	-	-	1	3
Grand total	7	3	13	193	136	85	84	521
Burnt unworked flint No/wt (g)	-	-	44/2161	26/491	71/3021	3/22	158/1846	302/7541
No burnt worked flints	-	-	-	37	16	10	26	89
No broken worked flints	1	-	2	99	65	23	43	233
No retouched flints	-	1	-	13	6	1	7	28

Table 65 The flint assemblages from the Thames Crossing watching brief (contexts 3 and 11), by chainage

Category type	35.220km to 35.240km		35.250km		35.250km to 35.255km		35.255km to 35.260km		35.260km to 35.267km		35.267km to 35.273km		35.267km to 35.277km		Grand total
	3	11	3	11	11	11	3	11	3	11	3	11	3	11	
Flake	2	23	93	20	15	9	2	5	1	6	1	6	3	6	185
Blade	-	4	33	8	1	1	1	-	-	1	-	2	-	2	51
Bladlet	-	1	4	1	3	3	-	-	-	-	-	-	-	1	10
Blade-like	3	4	17	3	3	4	-	-	-	-	-	1	-	1	36
Irregular waste	-	-	-	1	-	-	-	-	-	-	-	-	-	-	2
Rejuvenation flake core face/edge	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1
Rejuvenation flake tablet	-	-	3	-	-	-	-	-	-	-	-	-	-	-	3
Rejuvenation flake other	-	-	5	-	-	-	-	-	-	-	-	-	-	-	5
Thinning flake	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1
Flake from ground implement	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1
Core single platform blade core	-	-	2	-	-	-	-	-	-	-	-	-	-	-	2
Bipolar (opposed platform) blade core	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1
Other blade core	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
Tested nodule/bashed lump	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1
Single platform flake core	-	-	-	-	-	-	-	1	-	1	-	-	-	-	3
Multiplatform flake core	-	-	-	1	-	-	-	-	-	2	-	1	-	-	4
Keel non-discoidal flake core	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1
Levallois/other discoidal flake core	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1
Core on a flake	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1
Burin	-	-	2	3	-	-	-	-	-	-	-	-	-	-	5
Laurel leaf	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1
End scraper	-	1	4	-	-	-	-	-	-	-	-	-	-	-	5
Serrated flake	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
Notch	-	-	4	-	-	-	-	-	-	-	-	-	-	-	4
Backed knife	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1
Retouched flake	-	-	1	1	-	-	-	-	-	-	-	-	-	-	2
Grand total	5	34	169	44	23	14	5	8	1	9	3	1	10	3	329
Burnt unworked flint No/wt (g)	9/ 361	27/ 945	11/41 1855	37/ 1855	1/16	-	2/ 51	-	-	3/164	1/5	-	4/33	4/41	99/ 3512
No burnt worked flints (%)*	-	5 (14.7)	37 (21.9)	5 (11.4)	5	1	-	-	-	-	-	-	-	-	53 (16.1)
No broken worked flints (%)*	1	12 (35.4)	97 (57.4)	40 (90.9)	8	4	2	-	-	-	-	1	1	1	166 (50.5)
No betouched flints (%)*	-	2 (5.9)	11 (6.5)	6 (13.6)	-	-	-	-	-	-	-	-	-	-	19 (5.8)

*percentage excludes chips

Table 66 Technological attributes of selected flint assemblages: dorsal extent of cortex

Context	Dorsal extent (no=208)					
	0	1–25%	26–50%	51–75%	76–99%	100%
ARC TMS00 – 388006	24 (48)	12 (24)	6 (12)	4 (8)	4 (8)	
ARC 32001 – 3	67 (42.4)	48 (30.4)	20 (12.7)	7 (4.4)	14 (8.9)	2 (1.3)
388006/3 combined	91 (43.8)	60 (28.9)	26 (12.5)	11 (5.3)	18 (8.7)	2 (1.0)

Table 67 Technological attributes of selected flint assemblages: flake types

Context	Preparation	Side trimming	Flake type (no=208)			
			Distal trimming	Misc trimming	Non-cortical	Rejuvenation
ARC TMS00 – 388006	5 (10)	12 (24)	5 (10)	3 (6)	21 (42)	4 (8)
ARC 32001 – 3	14 (8.9)	33 (20.9)	22 (13.9)	20 (12.7)	61 (38.6)	8 (5.1)
388006/3 combined	19 (9.1)	45 (21.6)	27 (12.9)	23 (11.1)	82 (39.4)	12 (5.8)

Table 68 Technological attributes of selected flint assemblages: proportion of blades, presence of platform-edge abrasion and dorsal blade scars

Context	flakes >2:1 L:B ratio (%)	flakes with platform edge abrasion (%)	flakes with dorsal blade scars (%)
ARC TMS00 – 388006	1 (6.6%)	16 (50%)	15 (30%)
ARC 32001 – 3	23 (38.3%)	73 (70.9%)	58 (36.7%)
388006/3 combined	24 (32%)	89 (66%)	69 (33.2%)

Table 69 Technological attributes of selected flint assemblages: butt types

Context	Butt type (no=135)						
	Cortical	Plain	>1 Removal	Facetted	Linear	Punctiform	Other
ARC TMS00 – 388006	3 (9.1)	22 (66.7)	3 (9.1)	1 (3)	2 (6.1)	1 (3)	1 (3)
ARC 32001 – 3	5 (4.9)	45 (44.1)	18 (17.7)	8 (7.8)	6 (5.9)	11 (10.8)	9 (8.8)
388006/3 combined	8 (5.9)	67 (49.6)	21 (15.6)	9 (6.7)	8 (5.9)	12 (8.9)	10 (7.4)

Table 70 Technological attributes of selected flint assemblages: termination types

Context	Hinge	Termination type (no=137)			
		Step	Plunging	Feather	Other
ARC TMS00 – 388006	2 (6.9)		3 (10.3)	24 (82.8)	
ARC 32001 – 3	22 (20.4)	6 (5.6)	25 (23.2)	53 (49.1)	2 (1.9)
388006/3 combined	24 (17.5)	6 (4.4)	28 (20.4)	77 (56.2)	2 (1.5)

Table 71 Technological attributes of selected flint assemblages: hammer mode

Context	Hard	Hammer mode	
		Soft	Indeterminate
ARC TMS00 – 388006	8 (25)	35 (34)	43 (31.9)
ARC 32001 – 3	11 (34.4)	41 (39.8)	38 (28.1)
388006/3 combined	13 (40.6)	27 (26.2)	54 (40%)

Table 72 Prehistoric pottery fabric descriptions

Code	Description
A1/EN	Hard fabric with sparse coarse quartz sand (up to 1mm) and rare flint or quartz grits (up to 3mm) in a slightly micaceous matrix
F1/EN	Hard fabric with sparse ill-sorted angular (calcined) flint (up to 5mm) in a clay matrix that contains rare coarse quartz sand
FA1/EN	As above but with sparse to common coarse quartz sand
FP1/EN	Soft fabric with well-sorted sparse calcined flint (up to 1mm) and rare dark grey clay pellets (up to 1mm)
S1/EN	Soft friable fabric with common shell (sometimes leached) platelets (up to 4mm)
FS1/LBAEIA	Hard fabric with well-sorted sparse calcined flint (1–3mm) and rare lenticular voids (leached shell platelets)

Table 73 Breakdown of the prehistoric pottery assemblage from the Thames Crossing watching brief

Context	Chainage	Count, Wt	Fabric	Comment
001/002	35.240km	1, 21g	FP1/EN	Neck sherd
011	33.250–33.255km	2, 12g	S1/EN	
011	35.250–33.255km	1, 15g	A1/EN	?cup sherd
		1, 2g	S1/EN	Rolled rim
		1, 11g	F1/EN	Neck sherd
	35.220–35.240km	1, 34g	FA1/EN	Rim and neck sherd from a hemispherical bowl
		2, 19g	FA1/EN	Could be from the above vessel
		1, 20g	F1/EN	Body sherd – charred residue on interior surface
		1, 40g	FS1/LBAEIA	From a flat based vessel
Total		11, 174g		

Table 77 Microfossils from the Medway Tunnel

mOD	Plant debris & seeds	Insects	Brackish foraminifera	Brackish ostracods	Molluscs	Freshwater ostracods	Ecology	ESTUARINE FORAMINIFERA											ESTUARINE OSTRACODS														FW OS				
+0.04 / 0.01	X	X	X	X				<i>Jadammina macrescens</i>	<i>Trochammina inflata</i>	<i>Millammina fusca</i>	<i>Haynesina germanica</i>	<i>Epithium williamsoni</i>	<i>Ammonia</i> sp.	<i>Epithium wadense</i>	lagnids	milliols	<i>Leptocythere porcellanea</i>	<i>Loxocncha elliptica</i>	<i>Leptocythere lacertosa</i>	<i>Cyprides torosa</i>	<i>Leptocythere psammophila</i>	<i>Leptocythere castanea</i>	<i>Xestobens nitida</i>	<i>Cythera gibba</i>	<i>Cytheromopha fuscata</i>	<i>Semicythera sella</i>	<i>Pontocythere elongata</i>	<i>Hemicythere villosa</i>	<i>Paradoxostoma</i> sp.	<i>Hirschmannia vidua</i>	<i>Aunlia convexa</i>	<i>Limnocythere inopinata</i>	<i>Candona</i> sp.				
-0.71 / -0.76	X	X	X	X			Mid-high saltmarsh	X									XX																				
-0.83 / -0.88	X		X	X																																	
-1.01 / -1.06	X		X	X																																	
-1.14 / -0.19	X																																				
-1.53 / -1.58	X		X	X					X	XX	XX	XX	XX				XX																				
-2.05 / -2.10	X		X	X					X	XX	XX	XX	XX				XX																				
-3.18 / -3.23	X		X	X					X	XX	XX	XX	XX				X																				
-3.90 / -3.95	X		X	X					X	XX	XX	XX	XX				XX																				
-4.38 / -4.43	X		X	X					X	XX	XX	XX	XX				XX																				
-5.70 / -5.75	X		X	X					X	XX	XX	XX	XX				X																				
-7.43 / -7.48	X		X	X					X	XX	XX	XX	XX				X																				
-7.65 / -7.70	X		X	X					X	XX	XX	XX	XX				X																				
-7.90 / -7.95	X	X	X	X					X	XX	XX	XX	XX				X																				
-8.38 / -8.43	X	X	X	X					X	XX	XX	XX	XX				X																				
-9.18 / -9.23	X	X	X	X					X	XX	XX	XX	XX				X																				
-9.67 / -9.72	X	X	X	X					X	XX	XX	XX	XX				X																				

Foraminifera
 Calcareous foraminifera of low-mid saltmarsh and tidal flats
 Agglutinating foraminifera of mid-high saltmarsh
 Essentially marine species, but can penetrate outer estuaries

Ostracods
 Brackish ostracods of tidal flats and creeks
 Essentially marine species, but can penetrate outer estuaries
 Warm 'southern' marine species
 Freshwater ostracods (FW OS)