

## London Borough of Richmond PAH Survey

Annual Mean B[a]P Concentration: **0.17** ng m<sup>-3</sup>

N.D = None detected

UKAS Analysis of USEPA-16 BY GC-MS

### Apr-03

Sample No	Compound	Date On	Time On	Date Off	Time Off	Volume	Conc (ng)	Combined Particulate and Vapour
<b>PH40403</b>								<b>ng m-3</b>
	Naphthalene	16/04/2003	13:14	29/04/2003	14:28	256.16	<50	N.D
	Acenaphthylene	16/04/2003	13:14	29/04/2003	14:28	256.16	<2	N.D
	Acenaphthene	16/04/2003	13:14	29/04/2003	14:28	256.16	<12	N.D
	Fluorene	16/04/2003	13:14	29/04/2003	14:28	256.16	61	0.24
	Phenanthrene	16/04/2003	13:14	29/04/2003	14:28	256.16	1283	5.01
	Anthracene	16/04/2003	13:14	29/04/2003	14:28	256.16	49	0.19
	Fluoranthene	16/04/2003	13:14	29/04/2003	14:28	256.16	733	2.86
	Pyrene	16/04/2003	13:14	29/04/2003	14:28	256.16	471	1.84
	Benz(a)anthracene	16/04/2003	13:14	29/04/2003	14:28	256.16	16	0.06
	Chrysene	16/04/2003	13:14	29/04/2003	14:28	256.16	73	0.28
	Benzo(b)fluoranthene	16/04/2003	13:14	29/04/2003	14:28	256.16	116	0.45
	Benzo(k)fluoranthene	16/04/2003	13:14	29/04/2003	14:28	256.16	35	0.14
	Benzo(a)pyrene	16/04/2003	13:14	29/04/2003	14:28	256.16	26	<b>0.10</b>
	Indeno(1,2,3-cd)pyrene	16/04/2003	13:14	29/04/2003	14:28	256.16	31	0.12
	Dibenz(a,h)anthracene	16/04/2003	13:14	29/04/2003	14:28	256.16	4	0.02
	Benzo(g,h,i)perylene	16/04/2003	13:14	29/04/2003	14:28	256.16	49	0.19
	<b>Total PAH (ng m3)</b>							<b>11.50</b>

### May-03

Sample No	Compound	Date On	Time On	Date Off	Time Off	Volume	Conc (ng)	Combined Particulate and Vapour
<b>60503</b>								<b>ng m-3</b>
	Naphthalene	14/05/2003	13:29	30/05/2003	11:19	312.26	52	0.17
	Acenaphthylene	14/05/2003	13:29	30/05/2003	11:19	312.26	16	0.05
	Acenaphthene	14/05/2003	13:29	30/05/2003	11:19	312.26	27	0.09
	Fluorene	14/05/2003	13:29	30/05/2003	11:19	312.26	162	0.52
	Phenanthrene	14/05/2003	13:29	30/05/2003	11:19	312.26	1440	4.61
	Anthracene	14/05/2003	13:29	30/05/2003	11:19	312.26	61	0.20
	Fluoranthene	14/05/2003	13:29	30/05/2003	11:19	312.26	1001	3.21



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### Jul-03

Sample No	Compound	Date On	Time On	Date Off	Time Off	Volume	Conc (ng)	Combined Particulate and Vapour
<b>0</b>								<b>ng m-3</b>
	Naphthalene	18/06/2003	10:44	02/07/2003	10:44	295.34	0	unavailable
	Acenaphthylene	18/06/2003	10:44	02/07/2003	10:44	295.34	0	unavailable
	Acenaphthene	18/06/2003	10:44	02/07/2003	10:44	295.34	0	unavailable
	Fluorene	18/06/2003	10:44	02/07/2003	10:44	295.34	0	unavailable
	Phenanthrene	18/06/2003	10:44	02/07/2003	10:44	295.34	0	unavailable
	Anthracene	18/06/2003	10:44	02/07/2003	10:44	295.34	0	unavailable
	Fluoranthene	18/06/2003	10:44	02/07/2003	10:44	295.34	0	unavailable
	Pyrene	18/06/2003	10:44	02/07/2003	10:44	295.34	0	unavailable
	Benz(a)anthracene	18/06/2003	10:44	02/07/2003	10:44	295.34	0	unavailable
	Chrysene	18/06/2003	10:44	02/07/2003	10:44	295.34	0	unavailable
	Benzo(b)fluoranthene	18/06/2003	10:44	02/07/2003	10:44	295.34	0	unavailable
	Benzo(k)fluoranthene	18/06/2003	10:44	02/07/2003	10:44	295.34	0	unavailable
	Benzo(a)pyrene	18/06/2003	10:44	02/07/2003	10:44	295.34	0	unavailable
	Indeno(1,2,3-cd)pyrene	18/06/2003	10:44	02/07/2003	10:44	295.34	0	unavailable
	Dibenz(a,h)anthracene	18/06/2003	10:44	02/07/2003	10:44	295.34	0	unavailable
	Benzo(g,h,i)perylene	18/06/2003	10:44	02/07/2003	10:44	295.34	0	unavailable
	<b>Total PAH (ng m3)</b>							<b>unavailable</b>

### Aug-03

Sample No	Compound	Date On	Time On	Date Off	Time Off	Volume	Conc (ng)	Combined Particulate and Vapour
<b>RIC0803</b>								<b>ng m-3</b>
	Naphthalene	20/08/2003	14:00	04/09/2003	12:00	314.68	<5	N.D
	Acenaphthylene	20/08/2003	14:00	04/09/2003	12:00	314.68	<1	N.D
	Acenaphthene	20/08/2003	14:00	04/09/2003	12:00	314.68	<1	N.D
	Fluorene	20/08/2003	14:00	04/09/2003	12:00	314.68	241	0.77
	Phenanthrene	20/08/2003	14:00	04/09/2003	12:00	314.68	1298	4.12

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	<b>Anthracene</b>	20/08/2003	14:00	04/09/2003	12:00	314.68	53	0.17
	<b>Fluoranthene</b>	20/08/2003	14:00	04/09/2003	12:00	314.68	1198	3.81
	<b>Pyrene</b>	20/08/2003	14:00	04/09/2003	12:00	314.68	698	2.22
	<b>Benz(a)anthracene</b>	20/08/2003	14:00	04/09/2003	12:00	314.68	<1	N.D
	<b>Chrysene</b>	20/08/2003	14:00	04/09/2003	12:00	314.68	99	0.31
	<b>Benzo(b)fluoranthene</b>	20/08/2003	14:00	04/09/2003	12:00	314.68	94	0.30
	<b>Benzo(k)fluoranthene</b>	20/08/2003	14:00	04/09/2003	12:00	314.68	53	0.17
	<b>Benzo(a)pyrene</b>	20/08/2003	14:00	04/09/2003	12:00	314.68	<1	<b>N.D</b>
	<b>Indeno(1,2,3-cd)pyrene</b>	20/08/2003	14:00	04/09/2003	12:00	314.68	33	0.10
	<b>Dibenz(a,h)anthracene</b>	20/08/2003	14:00	04/09/2003	12:00	314.68	1	0.00
	<b>Benzo(g,h,i)perylene</b>	20/08/2003	14:00	04/09/2003	12:00	314.68	75	0.24
	<b>Total PAH (ng m3)</b>							<b>12.21</b>

### Sep-03

Sample No	Compound	Date On	Time On	Date Off	Time Off	Volume	Conc (ng)	Combined Particulate and Vapour ng m <sup>-3</sup>
<b>RIC0903</b>								
	<b>Naphthalene</b>	23/09/2003	11:00	09/10/2003	11:00	337.54	106	0.31
	<b>Acenaphthylene</b>	23/09/2003	11:00	09/10/2003	11:00	337.54	13	0.04
	<b>Acenaphthene</b>	23/09/2003	11:00	09/10/2003	11:00	337.54	37	0.11
	<b>Fluorene</b>	23/09/2003	11:00	09/10/2003	11:00	337.54	170	0.50
	<b>Phenanthrene</b>	23/09/2003	11:00	09/10/2003	11:00	337.54	2146	6.36
	<b>Anthracene</b>	23/09/2003	11:00	09/10/2003	11:00	337.54	70	0.21
	<b>Fluoranthene</b>	23/09/2003	11:00	09/10/2003	11:00	337.54	840	2.49
	<b>Pyrene</b>	23/09/2003	11:00	09/10/2003	11:00	337.54	613	1.82
	<b>Benz(a)anthracene</b>	23/09/2003	11:00	09/10/2003	11:00	337.54	31	0.09
	<b>Chrysene</b>	23/09/2003	11:00	09/10/2003	11:00	337.54	80	0.24
	<b>Benzo(b)fluoranthene</b>	23/09/2003	11:00	09/10/2003	11:00	337.54	106	0.31
	<b>Benzo(k)fluoranthene</b>	23/09/2003	11:00	09/10/2003	11:00	337.54	59	0.17
	<b>Benzo(a)pyrene</b>	23/09/2003	11:00	09/10/2003	11:00	337.54	21	<b>0.06</b>
	<b>Indeno(1,2,3-cd)pyrene</b>	23/09/2003	11:00	09/10/2003	11:00	337.54	57	0.17
	<b>Dibenz(a,h)anthracene</b>	23/09/2003	11:00	09/10/2003	11:00	337.54	6	0.02

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	<b>Benzo(g,h,i)perylene</b>	23/09/2003	11:00	09/10/2003	11:00	337.54	100	0.30
	<b>Total PAH (ng m3)</b>							<b>13.20</b>

### Oct-03

Sample No	Compound	Date On	Time On	Date Off	Time Off	Volume	Conc (ng)	Combined Particulate and Vapour
<b>RIC1003</b>								<b>ng m-3</b>
	<b>Naphthalene</b>	30/10/2003	10:30	13/11/2003	10:45	295.56	79	0.27
	<b>Acenaphthylene</b>	30/10/2003	10:30	13/11/2003	10:45	295.56	68	0.23
	<b>Acenaphthene</b>	30/10/2003	10:30	13/11/2003	10:45	295.56	43	0.15
	<b>Fluorene</b>	30/10/2003	10:30	13/11/2003	10:45	295.56	232	0.78
	<b>Phenanthrene</b>	30/10/2003	10:30	13/11/2003	10:45	295.56	2992	10.12
	<b>Anthracene</b>	30/10/2003	10:30	13/11/2003	10:45	295.56	216	0.73
	<b>Fluoranthene</b>	30/10/2003	10:30	13/11/2003	10:45	295.56	1215	4.11
	<b>Pyrene</b>	30/10/2003	10:30	13/11/2003	10:45	295.56	968	3.28
	<b>Benz(a)anthracene</b>	30/10/2003	10:30	13/11/2003	10:45	295.56	93	0.31
	<b>Chrysene</b>	30/10/2003	10:30	13/11/2003	10:45	295.56	172	0.58
	<b>Benzo(b)fluoranthene</b>	30/10/2003	10:30	13/11/2003	10:45	295.56	269	0.91
	<b>Benzo(k)fluoranthene</b>	30/10/2003	10:30	13/11/2003	10:45	295.56	149	0.50
	<b>Benzo(a)pyrene</b>	30/10/2003	10:30	13/11/2003	10:45	295.56	98	<b>0.33</b>
	<b>Indeno(1,2,3-cd)pyrene</b>	30/10/2003	10:30	13/11/2003	10:45	295.56	147	0.50
	<b>Dibenz(a,h)anthracene</b>	30/10/2003	10:30	13/11/2003	10:45	295.56	21	0.07
	<b>Benzo(g,h,i)perylene</b>	30/10/2003	10:30	13/11/2003	10:45	295.56	195	0.66
	<b>Total PAH (ng m3)</b>							<b>23.54</b>

### Nov-03

Sample No	Compound	Date On	Time On	Date Off	Time Off	Volume	Conc (ng)	Combined Particulate and Vapour
<b>RIC1103</b>								<b>ng m-3</b>
	<b>Naphthalene</b>	25/11/2003	12:05	11/12/2003	11:35	337.10	<20	0.00
	<b>Acenaphthylene</b>	25/11/2003	12:05	11/12/2003	11:35	337.10	22	0.07
	<b>Acenaphthene</b>	25/11/2003	12:05	11/12/2003	11:35	337.10	21	0.06

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UKAS Analysis of USEPA-16 BY GC-MS

	<b>Fluorene</b>	25/11/2003	12:05	11/12/2003	11:35	337.10	340	1.01
	<b>Phenanthrene</b>	25/11/2003	12:05	11/12/2003	11:35	337.10	3300	9.79
	<b>Anthracene</b>	25/11/2003	12:05	11/12/2003	11:35	337.10	200	0.59
	<b>Fluoranthene</b>	25/11/2003	12:05	11/12/2003	11:35	337.10	1400	4.15
	<b>Pyrene</b>	25/11/2003	12:05	11/12/2003	11:35	337.10	1200	3.56
	<b>Benz(a)anthracene</b>	25/11/2003	12:05	11/12/2003	11:35	337.10	100	0.30
	<b>Chrysene</b>	25/11/2003	12:05	11/12/2003	11:35	337.10	330	0.98
	<b>Benzo(b)fluoranthene</b>	25/11/2003	12:05	11/12/2003	11:35	337.10	190	0.56
	<b>Benzo(k)fluoranthene</b>	25/11/2003	12:05	11/12/2003	11:35	337.10	230	0.68
	<b>Benzo(a)pyrene</b>	25/11/2003	12:05	11/12/2003	11:35	337.10	150	<b>0.44</b>
	<b>Indeno(1,2,3-cd)pyrene</b>	25/11/2003	12:05	11/12/2003	11:35	337.10	69	0.20
	<b>Dibenz(a,h)anthracene</b>	25/11/2003	12:05	11/12/2003	11:35	337.10	19	0.06
	<b>Benzo(g,h,i)perylene</b>	25/11/2003	12:05	11/12/2003	11:35	337.10	340	1.01
	<b>Total PAH (ng m3)</b>							<b>23.47</b>

### Dec-03

Sample No	Compound	Date On	Time On	Date Off	Time Off	Volume	Conc (ng)	Combined Particulate and Vapour
<b>RIC1203</b>								<b>ng m-3</b>
	<b>Naphthalene</b>	22/12/2003	12:00	07/01/2004	11:20	336.95	77	0.23
	<b>Acenaphthylene</b>	22/12/2003	12:00	07/01/2004	11:20	336.95	23	0.07
	<b>Acenaphthene</b>	22/12/2003	12:00	07/01/2004	11:20	336.95	18	0.05
	<b>Fluorene</b>	22/12/2003	12:00	07/01/2004	11:20	336.95	160	0.47
	<b>Phenanthrene</b>	22/12/2003	12:00	07/01/2004	11:20	336.95	3000	8.90
	<b>Anthracene</b>	22/12/2003	12:00	07/01/2004	11:20	336.95	200	0.59
	<b>Fluoranthene</b>	22/12/2003	12:00	07/01/2004	11:20	336.95	1400	4.15
	<b>Pyrene</b>	22/12/2003	12:00	07/01/2004	11:20	336.95	1200	3.56
	<b>Benz(a)anthracene</b>	22/12/2003	12:00	07/01/2004	11:20	336.95	3.3	0.01
	<b>Chrysene</b>	22/12/2003	12:00	07/01/2004	11:20	336.95	250	0.74
	<b>Benzo(b)fluoranthene</b>	22/12/2003	12:00	07/01/2004	11:20	336.95	130	0.39
	<b>Benzo(k)fluoranthene</b>	22/12/2003	12:00	07/01/2004	11:20	336.95	210	0.62
	<b>Benzo(a)pyrene</b>	22/12/2003	12:00	07/01/2004	11:20	336.95	78	<b>0.23</b>

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N.D = None detected

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	<b>Indeno(1,2,3-cd)pyrene</b>	22/12/2003	12:00	07/01/2004	11:20	336.95	47	0.14
	<b>Dibenz(a,h)anthracene</b>	22/12/2003	12:00	07/01/2004	11:20	336.95	35	0.10
	<b>Benzo(g,h,i)perylene</b>	22/12/2003	12:00	07/01/2004	11:20	336.95	240	0.71
	<b>Total PAH (ng m3)</b>							<b>20.99</b>

### Jan-04

Sample No	Compound	Date On	Time On	Date Off	Time Off	Volume	Conc (ng)	Combined Particulate and Vapour
<b>RIC0104</b>								<b>ng m-3</b>
	<b>Naphthalene</b>	27/01/2004	12:00	08/02/2004	12:00	253.15	230	0.91
	<b>Acenaphthylene</b>	27/01/2004	12:00	08/02/2004	12:00	253.15	71	0.28
	<b>Acenaphthene</b>	27/01/2004	12:00	08/02/2004	12:00	253.15	43	0.17
	<b>Fluorene</b>	27/01/2004	12:00	08/02/2004	12:00	253.15	290	1.15
	<b>Phenanthrene</b>	27/01/2004	12:00	08/02/2004	12:00	253.15	1700	6.72
	<b>Anthracene</b>	27/01/2004	12:00	08/02/2004	12:00	253.15	140	0.55
	<b>Fluoranthene</b>	27/01/2004	12:00	08/02/2004	12:00	253.15	850	3.36
	<b>Pyrene</b>	27/01/2004	12:00	08/02/2004	12:00	253.15	680	2.69
	<b>Benz(a)anthracene</b>	27/01/2004	12:00	08/02/2004	12:00	253.15	55	0.22
	<b>Chrysene</b>	27/01/2004	12:00	08/02/2004	12:00	253.15	110	0.43
	<b>Benzo(b)fluoranthene</b>	27/01/2004	12:00	08/02/2004	12:00	253.15	68	0.27
	<b>Benzo(k)fluoranthene</b>	27/01/2004	12:00	08/02/2004	12:00	253.15	84	0.33
	<b>Benzo(a)pyrene</b>	27/01/2004	12:00	08/02/2004	12:00	253.15	56	<b>0.22</b>
	<b>Indeno(1,2,3-cd)pyrene</b>	27/01/2004	12:00	08/02/2004	12:00	253.15	42	0.17
	<b>Dibenz(a,h)anthracene</b>	27/01/2004	12:00	08/02/2004	12:00	253.15	5.4	0.02
	<b>Benzo(g,h,i)perylene</b>	27/01/2004	12:00	08/02/2004	12:00	253.15	86	0.34
	<b>Total PAH (ng m3)</b>							<b>17.82</b>

### Feb-04

Sample No	Compound	Date On	Time On	Date Off	Time Off	Volume	Conc (ng)	Combined Particulate and Vapour
<b>RIC0204</b>								<b>ng m-3</b>
	<b>Naphthalene</b>	00/01/1900	00:00	00/01/1900	00:00	0.00	Not available	unavailable

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N.D = None detected

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	<b>Acenaphthylene</b>	00/01/1900	00:00	00/01/1900	00:00	0.00	Broken sample	unavailable
	<b>Acenaphthene</b>	00/01/1900	00:00	00/01/1900	00:00	0.00	trap	unavailable
	<b>Fluorene</b>	00/01/1900	00:00	00/01/1900	00:00	0.00	0	unavailable
	<b>Phenanthrene</b>	00/01/1900	00:00	00/01/1900	00:00	0.00	0	unavailable
	<b>Anthracene</b>	00/01/1900	00:00	00/01/1900	00:00	0.00	0	unavailable
	<b>Fluoranthene</b>	00/01/1900	00:00	00/01/1900	00:00	0.00	0	unavailable
	<b>Pyrene</b>	00/01/1900	00:00	00/01/1900	00:00	0.00	0	unavailable
	<b>Benz(a)anthracene</b>	00/01/1900	00:00	00/01/1900	00:00	0.00	0	unavailable
	<b>Chrysene</b>	00/01/1900	00:00	00/01/1900	00:00	0.00	0	unavailable
	<b>Benzo(b)fluoranthene</b>	00/01/1900	00:00	00/01/1900	00:00	0.00	0	unavailable
	<b>Benzo(k)fluoranthene</b>	00/01/1900	00:00	00/01/1900	00:00	0.00	0	unavailable
	<b>Benzo(a)pyrene</b>	00/01/1900	00:00	00/01/1900	00:00	0.00	0	<b>unavailable</b>
	<b>Indeno(1,2,3-cd)pyrene</b>	00/01/1900	00:00	00/01/1900	00:00	0.00	0	unavailable
	<b>Dibenz(a,h)anthracene</b>	00/01/1900	00:00	00/01/1900	00:00	0.00	0	unavailable
	<b>Benzo(g,h,i)perylene</b>	00/01/1900	00:00	00/01/1900	00:00	0.00	0	unavailable
	<b>Total PAH (ng m3)</b>							<b>unavailable</b>

### Mar-04

Sample No	Compound	Date On	Time On	Date Off	Time Off	Volume	Conc (ng)	Combined Particulate and Vapour
<b>RIC0304</b>								<b>ng m-3</b>
	<b>Naphthalene</b>	31/03/2004	11:07	14/04/2004	11:12	295.42	52	0.18
	<b>Acenaphthylene</b>	31/03/2004	11:07	14/04/2004	11:12	295.42	35	0.12
	<b>Acenaphthene</b>	31/03/2004	11:07	14/04/2004	11:12	295.42	25	0.08
	<b>Fluorene</b>	31/03/2004	11:07	14/04/2004	11:12	295.42	120	0.41
	<b>Phenanthrene</b>	31/03/2004	11:07	14/04/2004	11:12	295.42	990	3.35
	<b>Anthracene</b>	31/03/2004	11:07	14/04/2004	11:12	295.42	70	0.24
	<b>Fluoranthene</b>	31/03/2004	11:07	14/04/2004	11:12	295.42	520	1.76
	<b>Pyrene</b>	31/03/2004	11:07	14/04/2004	11:12	295.42	380	1.29
	<b>Benz(a)anthracene</b>	31/03/2004	11:07	14/04/2004	11:12	295.42	20	0.07
	<b>Chrysene</b>	31/03/2004	11:07	14/04/2004	11:12	295.42	51	0.17
	<b>Benzo(b)fluoranthene</b>	31/03/2004	11:07	14/04/2004	11:12	295.42	26	0.09
	<b>Benzo(k)fluoranthene</b>	31/03/2004	11:07	14/04/2004	11:12	295.42	21	0.07



