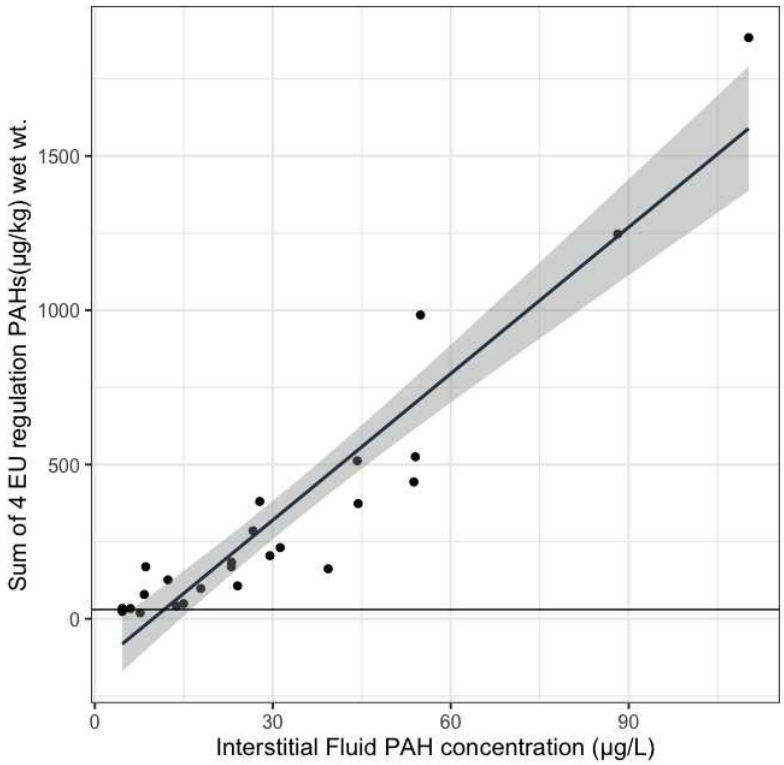

Figure S1. Regression model calibrated for PAH4 of EU regulation (Eqn: y=15.82x-154.79; r^2 =0.89, df=23). Most oysters from the Elizabeth River sites had PAH levels that were orders of magnitude above maximum limits for human consumption (30µg/kg wet wt., denoted as black horizontal line).

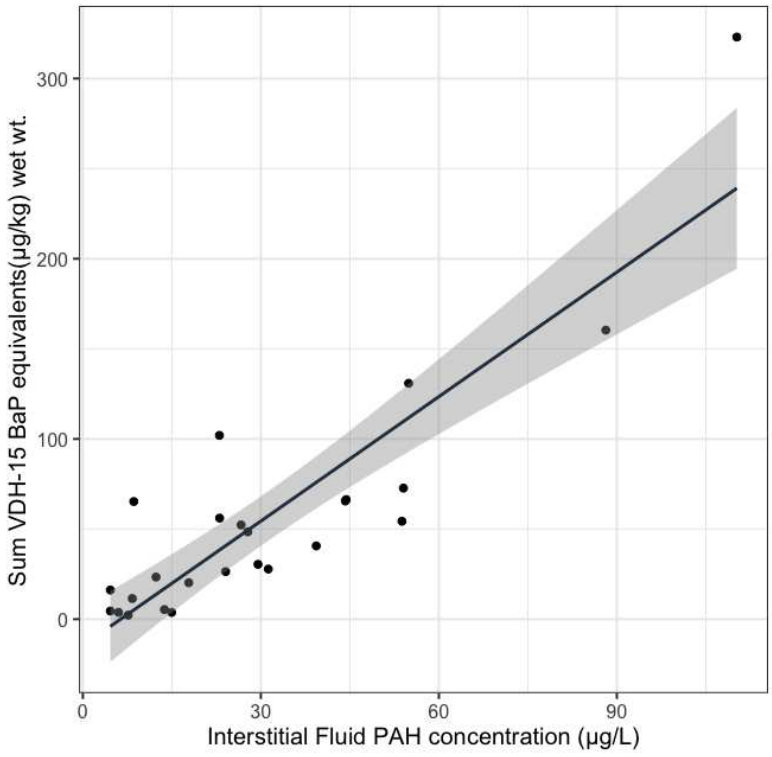

Figure S2. Regression model calibrated for 15 B*a*P equivalent concentrations of VDH health advisory (Eqn: y=2.3x-14.67; r^2 =0.77, df=23). Oysters from sites throughout the Elizabeth River fell within all 4 tiers of the VDH multi-tier advisory approach.

Table S1. List of PAH analytes, internal standard, and surrogate standards for GC-MS analysis

Name	CAS no.	Name	CAS no.
p-terphenyl (internal standard)	92-94-4	phenanthridine	229-87-8
d8-naphthalene (surrogate std)	1146-65-2	carbazole	86-74-8
naphthalene	91-20-3	4-methyl dibenzothiophene	7372-88-5
benzo{b}thiophene	95-15-8	1-phenyl naphthalene	605-02-7
isoquinoline	119-65-3	2-methyl phenanthrene	2531-84-2
quinoline	91-22-5	2-methyl anthracene	613-12-7
2-methyl naphthalene	91-57-6	benzo(c)cinnoline	230-17-1
1-methyl naphthalene	90-12-0	4,5-methylene phenanthrene	203-64-5
biphenyl	92-52-4	1-methylanthracene	610-48-0
2-ethylnaphthalene	939-27-5	4-methylphenanthrene	832-64-4
1-ethylnaphthalene	1127-76-0	1-methylphenanthrene	832-69-9
2-methyl biphenyl (2-phenyl toluene)	643-58-3	4,6-dimethyldibenzothiophene	1207-12-1
diphenyl ether	101-84-8	9-methyl anthracene	779-02-2
2,6&2,7 dimethyl naphthalene	581-42-0	2-phenyl naphthalene	612-94-2
1,3&1,7 -dimethyl naphthalene	575-41-7	3,6-dimethyl phenanthrene	1576-67-6
1,6-dimethyl naphthalene	575-43-9	2-ethyl anthracene	52251-71-5
1,4&2,3 dimethyl naphthalene	571-58-4	fluoranthene	206-44-0
1,5-dimethyl naphthalene	571-61-9	pyrene	129-00-0
acenaphthylene	208-96-8	9,10-dimethyl anthracene	781-43-1
1,2-dimethyl naphthalene	573-98-8	2,3-benzofluorene	243-17-4
1,8-dimethyl naphthalene	569-41-5	1-methylpyrene	2381-21-7
d10-acenaphthene (surrogate std)	15067-26-2	1,1' binaphthyl (surrogate std)	604-53-5
3-methyl biphenyl	643-93-6	9-phenyl anthracene	602-55-1
acenaphthene	83-32-9	benz(a)anthracene	56-55-3
dibenzofuran	132-64-9	d12-chrsyene (surrogate std)	1719-03-5
2,3,6 trimethyl naphthalene	829-26-5	chrysene	218-01-9
2,3,5-trimethyl naphthalene	2245-38-7	benzo(b)fluoranthene	205-99-2
fluorene	86-73-7	benzo(k)fluoranthene	207-08-9
3,3'-dimethyl biphenyl	612-75-9	benzo(j)fluoranthene	205-82-3
1,4,5-trimethyl naphthalene	2131-41-1	benzo(e)pyrene	192-97-2
1-methylfluorene	1730-37-6	benzo(a)pyrene	50-32-8
dibenzo[b]thiophene	132-65-0	d12-perylene (surrogate std)	1520-96-3
d10-phenathrene (surrogate std)	1517-22-2	perylene	198-55-0
phenanthrene	85-01-8	indeno (1,2,3-cd) pyrene	193-39-5
anthracene	120-12-7	dibenzo (a,h) anthracene	53-70-3
acridine	260-94-6	benzo (g,h,i) perylene	191-24-2

Table S2. List of toxic equivalent factors (TEF) and converted benzo [a] pyrene equivalent concentrations (BaPEs) for VDH's 15 priority PAHs across Elizabeth River Sites. BaPEs were calculated by multiplying their respective TEF (first column) by original analyte concentration. Concentrations listed in the table have already been converted to a BaPE concentration. Total BaPE concentrations at each site were then converted to a wet weight concentration via wet to dry weight ratio for each sample.

PAH compound	TEF	MP2	JRWS	PARCR	JCBH	JCBR	RS	GR	CLY	HB	HR	PB	GLM	264	HS	NSC	CMP	BK	MPB	PCR	164	JB	CB-001	CB-002	CB-004	CB-005
acenanapthylene	0.001	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.1
acenapthene	0.001	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
fluorene	0.001	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
phenathrene	0.001	0.1	0.1	0.0	0.1	0.6	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.2
anthracene	0.01	0.7	0.0	0.3	0.4	1.4	1.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.5	0.9	1.1	1.0
fluoranthene	0.001	0.6	0.3	0.7	0.9	3.2	9.3	0.2	0.2	0.2	0.4	0.3	0.6	0.5	1.2	0.8	1.4	1.4	1.4	1.8	1.0	1.8	1.0	1.4	2.2	3.3
pyrene	0.001	0.5	0.3	0.5	0.5	2.2	6.3	0.2	0.1	0.1	0.3	0.2	0.4	0.3	1.0	0.6	0.9	0.8	0.9	1.2	0.6	1.1	0.5	0.7	1.1	1.8
benz (a) anthracene	0.1	22.4	3.5	17.2	22.9	67.3	149.2	7.6	4.9	3.1	11.9	6.6	14.5	5.0	33.5	21.9	29.1	38.4	45.5	58.5	15.8	46.8	16.9	25.1	30.4	36.8
chrysene	0.01	3.7	0.6	2.4	3.3	16.7	39.7	0.9	0.8	0.6	1.7	1.0	2.6	1.5	3.6	2.3	4.9	5.5	6.4	8.3	6.6	14.9	5.7	8.5	15.2	19.1
benzo(b) fluoranthene	0.1	114.7	4.0	40.0	66.2	125.0	785.3	8.2	8.5	4.7	19.3	9.3	24.6	10.8	29.0	13.0	39.2	46.8	69.9	83.1	50.1	128.3	134.9	201.8	390.3	472.6
benzo(k)fluoranthene	0.1	90.4	6.6	26.8	35.2	65.7	522.5	5.6	6.2	3.5	11.0	6.2	12.2	1.6	26.9	9.6	23.6	21.5	35.8	40.0	18.9	48.1	74.2	87.4	118.3	184.3
benzo(a)pyrene	1	550.2	179.0	101.1	206.1	144.6	810.3	0.0	6.4	2.5	24.5	0.0	13.0	2.7	197.5	63.2	75.7	48.6	76.2	90.4	65.0	115.0	100.8	80.9	147.5	123.8
ideno(1,2,3,cd)pyrene	0.1	47.4	21.3	0.0	13.6	11.7	49.3	2.1	0.0	0.0	1.7	4.7	2.2	0.0	21.4	8.0	12.3	4.3	5.7	6.9	4.1	4.4	17.3	15.7	22.9	28.5
dibenz(a,h)anthracene	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.2	0.0	376.2	30.9	182.9	41.9	95.0	0.0	0.0	62.3	0.0	0.0	0.0	0.0
benzo(g,h,i)perylene	0.1	51.2	0.0	0.0	10.2	21.6	55.5	2.9	2.0	1.5	2.9	4.7	3.0	0.6	22.4	8.5	11.0	5.9	7.0	6.6	4.1	5.5	36.9	21.1	51.0	44.8
SUM VDH-15 (dry wt.)		882.0	215.8	189.0	359.7	460.4	2428.7	27.9	29.2	16.3	73.9	33.3	123.6	23.2	713.2	159.0	381.5	215.6	344.2	297.3	166.5	428.6	389.1	443.7	780.2	916.2
wet to dry wt. ratio		0.24	0.57	0.11	0.14	0.04	0.06	0.00	0.03	0.02	0.05	0.00	0.02	0.01	0.17	0.10	0.06	0.03	0.04	0.04	0.05	0.03	0.05	0.03	0.03	0.02
SUM VDH-15 (wet wt.)		**65.3**	**16.2**	**20.2**	**40.6**	**54.3**	**323.0**	**3.8**	**4.5**	**2.2**	**11.5**	**5.3**	**23.4**	**3.7**	**102.0**	**26.4**	**56.1**	**30.4**	**52.3**	**48.5**	**27.8**	**65.6**	**17.9**	**11.2**	**19.6**	**15.9**

Table S3. List of EFSA-4 PAH concentrations across Elizabeth River Sites. Total dry weight concentrations converted to wet weight through multiplying by wet to dry weight ratio for each sample.

PAH compound	MP2	JRWS	PARCR	JCBH	JCBR	RS	GR	CLY	HB	HR	PB	GLM	264	HS	NSC	CMP	BK	MPB	PCR	164	JB	CB-001	CB-002	CB-004	CB-005
benz(a)anthracene	224.1	34.7	171.8	229.2	673.5	1491.6	75.8	48.8	30.6	119.2	66.5	145.4	50.5	335.2	218.8	290.7	384.3	454.6	585.4	157.8	467.9	168.9	251.1	303.9	368.4
chrysene	369.6	61.8	241.9	333.2	1673.8	3967.8	85.8	78.6	60.5	173.6	100.5	264.6	147.1	356.7	231.7	493.3	551.7	642.9	826.8	655.9	1486.7	570.6	853.9	1515.4	1907.1
benzo(b)fluoranthene	1147.4	40.5	400.2	661.6	1250.4	7853.5	82.4	84.9	46.9	192.8	93.0	245.7	107.6	289.8	129.9	392.4	467.9	698.8	830.6	501.2	1283.5	1349.0	2018.4	3903.1	4725.6
benzo(a)pyrene	550.2	179.0	101.1	206.1	144.6	810.3	0.0	6.4	2.5	24.5	0.0	13.0	2.7	197.5	63.2	75.7	48.6	76.2	90.4	65.0	115.0	100.8	80.9	147.5	123.8
SUM EFSA-4 (dry wt.)	2291.3	316.1	915.0	1430.1	3742.4	14123.1	244.0	218.7	140.5	510.1	260.0	668.7	307.8	1179.3	643.5	1252.1	1452.5	1872.5	2333.2	1379.9	3353.1	2189.4	3204.3	5869.9	7124.9
wet to dry wt. ratio	0.24	0.57	0.11	0.14	0.04	0.06	0.00	0.03	0.02	0.05	0.00	0.02	0.01	0.17	0.10	0.06	0.03	0.04	0.04	0.05	0.03	0.05	0.03	0.03	0.02
SUM EFSA-4 (wet wt.)	**168.7**	**23.6**	**98.3**	**162.1**	**443.5**	**1883.6**	**33.2**	**33.7**	**19.1**	**79.0**	**41.6**	**126.2**	**49.2**	**168.5**	**106.7**	**183.5**	**204.6**	**285.1**	**380.4**	**230.7**	**512.1**	**373.5**	**525.2**	**984.8**	**1247.2**

Table S4. List of EPA-16 PAH concentrations across Elizabeth River Sites. Total dry weight concentrations converted to wet weight through multiplying by wet to dry weight ratio for each sample.

PAH compound	MP2	JRWS	PARCR	JCBH	JCBR	RS	GR	CLY	HB	HR	PB	GLM	264	HS	NSC	CMP	BK	MPB	PCR	164	JB	CB-001	CB-002	CB-004	CB-005
naphthalene	0.0	28.3	22.1	12.2	18.7	74.6	21.5	0.0	9.5	26.5	51.1	14.6	16.3	28.7	27.6	37.6	24.9	21.3	13.8	23.8	15.6	111.8	42.7	113.9	36.5
acenaphthylene	55.2	0.0	0.0	36.7	25.0	46.6	0.0	0.0	0.0	52.9	0.0	14.6	0.0	21.6	0.0	0.0	8.3	21.3	20.8	7.9	23.4	167.7	34.2	46.9	116.8
acenaphthene	32.0	0.0	20.9	23.5	49.6	22.8	38.1	22.4	11.2	15.9	42.2	15.1	17.3	17.0	19.0	23.5	23.4	25.7	21.2	18.0	26.0	8.8	23.4	29.3	0.0
fluorene	0.0	0.0	0.0	44.7	101.7	31.4	32.7	22.4	22.4	15.9	35.2	15.1	17.3	22.7	19.0	11.8	23.4	15.4	21.2	18.0	15.6	0.0	20.8	0.0	0.0
phenanthrene	104.9	103.7	44.6	82.9	610.2	148.8	60.0	30.8	30.3	23.8	43.4	88.8	117.2	344.4	158.9	203.0	173.0	122.4	154.8	148.1	153.5	111.4	133.6	145.3	158.2
anthracene	69.9	0.0	27.2	39.3	141.8	113.0	10.7	8.8	9.3	15.9	15.3	21.1	14.3	12.7	10.2	19.8	20.1	24.0	24.7	17.4	26.7	53.4	86.4	106.7	97.7
fluoranthene	624.4	282.2	684.1	928.8	3212.5	9289.9	233.5	206.7	184.0	394.2	319.3	553.8	459.1	1231.8	784.1	1411.1	1376.7	1370.5	1843.5	972.7	1762.3	1016.5	1414.2	2187.0	3262.3
pyrene	524.6	250.2	529.6	538.2	2191.7	6317.0	162.8	149.5	118.8	259.3	214.6	355.1	286.9	1012.1	556.0	911.0	840.0	912.1	1238.0	583.6	1110.4	545.4	693.4	1105.5	1840.2
benz(a)anthracene	224.1	34.7	171.8	229.2	673.5	1491.6	75.8	48.8	30.6	119.2	66.5	145.4	50.5	335.2	218.8	290.7	384.3	454.6	585.4	157.8	467.9	168.9	251.1	303.9	368.4
chrysene	369.6	61.8	241.9	333.2	1673.8	3967.8	85.8	78.6	60.5	173.6	100.5	264.6	147.1	356.7	231.7	493.3	551.7	642.9	826.8	655.9	1486.7	570.6	853.9	1515.4	1907.1
benzo(b)fluoranthene	1147.4	40.5	400.2	661.6	1250.4	7853.5	82.4	84.9	46.9	192.8	93.0	245.7	107.6	289.8	129.9	392.4	467.9	698.8	830.6	501.2	1283.5	1349.0	2018.4	3903.1	4725.6
benzo(k)fluoranthene	903.8	66.1	267.6	352.4	656.7	5225.0	56.4	61.6	34.6	109.7	61.6	121.7	16.3	268.6	95.9	236.3	215.1	358.3	400.0	188.7	481.3	742.0	873.7	1183.4	1842.7
benzo(a)pyrene	550.2	179.0	101.1	206.1	144.6	810.3	0.0	6.4	2.5	24.5	0.0	13.0	2.7	197.5	63.2	75.7	48.6	76.2	90.4	65.0	115.0	100.8	80.9	147.5	123.8
indeno(1,2,3-cd)pyrene	473.7	213.4	0.0	136.2	117.0	492.6	21.0	0.0	0.0	16.6	47.0	22.1	0.0	214.2	80.4	122.8	43.3	57.0	68.7	41.3	43.6	172.7	156.5	228.8	284.7
dibenzo(a,h)anthracene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0	75.2	6.2	36.6	8.4	19.0	0.0	0.0	12.5	0.0	0.0	0.0	0.0
benzo(g,h,i)perylene	512.1	0.0	0.0	102.5	216.5	554.8	28.5	19.9	15.4	29.0	47.0	30.1	5.7	224.4	85.0	109.8	58.7	69.7	65.6	41.3	54.5	369.0	210.8	510.2	448.2
SUM EPA-16 (dry wt.)	5592.0	1259.9	2511.2	3727.5	11083.7	36439.7	909.2	740.7	576.1	1469.6	1136.7	1930.7	1258.4	4652.8	2485.8	4375.4	4267.9	4889.0	6205.5	3440.7	7078.5	5488.1	6894.1	11526.9	15212.1
wet to dry wt. ratio	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
SUM EPA-16 (wet wt.)	**411.6**	**94.2**	**269.7**	**422.4**	**1313.4**	**4860.0**	**123.8**	**114.2**	**78.4**	**227.7**	**181.9**	**364.5**	**200.9**	**664.7**	**412.2**	**641.3**	**601.3**	**744.3**	**1011.7**	**575.3**	**1081.0**	**936.2**	**1129.9**	**1933.8**	**2662.8**