

Chemical Contaminant Sampling and Analysis of Shellfish from Classified Harvesting Areas (2013)

Report to the Food Standards Agency in Scotland

June 2013



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Glossary of Main Terms

Term or Acronym	General Meaning Of Term
EU	European Union
EC	European Commission
FSAS	Food Standards Agency in Scotland
WHO	World Health Organisation
PAHs	Polycyclic aromatic hydrocarbons
PAH 4 Sum	Sum of 4 PAHs (benzo[a]pyrene, benz[a]anthracene, benzo[b]fluoranthene, chrysene)
PCB	Polychlorinated biphenyl
<i>Ortho</i> -PCB	Ortho-substituted PCB (non planar)
<i>Non-ortho</i> -PCB	Non-ortho-substituted PCB (co-planar)
Dioxins	Collective name for chlorinated Dioxins & Furans
PCDD/F	Polychlorinated dibenzo- <i>p</i> -dioxin/ polychlorinated dibenzofuran
TEF	Toxic Equivalency Factor – toxicity expressed for each dioxin-like compound as a fraction of 2,3,7,8-TCDD (2,3,7,8-TCDD = 1).
TEQ	Toxic Equivalence – product of the congener concentration and the TEF
Total TEQ	Total of the Sum of all the Toxic Equivalences (TEQs) for each group of compounds
Sum of ICES 6	Sum of PCB28, PCB52, PCB101, PCB138, PCB153 and PCB180
fat weight	Values relevant to the assessed fat content of the sample
whole weight	Values based on the sample as received 'whole' or wet
WHO-TEQ 2005	World Health Organisation - TEQ based on values as set in 2005
LOD	Limit of Detection
LOQ	Limit of Quantification
Lower bound	assumes values at less than the limit of detection are zero (e.g.<math><0.01=0</math>)
Upper bound	assumes values at less than the limit of detection are equal to the limit of detection (e.g. <math><0.07=0.07</math>)
Trace Element	An element in a sample that has an average concentration of less than 100 parts per million (less than 100 mg/kg)
Heavy Metals	A loosely defined subset of elements that exhibit metallic properties (some are toxic, some are a nutritional requirement in small amounts), (This survey includes, Cr, Mn, Co, Ni, Cu, Zn, As, Se, Ag, Cd, Hg & Pb, (Chromium, manganese, cobalt, nickel, copper, zinc, arsenic, selenium, silver, cadmium, mercury and lead)
ng/kg	Nanogram per kilogram (x10 ⁻⁹ / part per trillion)
µg/kg	Microgram per kilogram (x 10 ⁻⁶ / part per billion)
mg/kg	Milligram per kilogram (x 10 ⁻³ / part per million)
ICP-MS	Inductively coupled plasma-mass spectrometry
HRGC-HRMS	High resolution gas chromatography - high resolution mass spectrometry
HRGC-LRMS	High resolution gas chromatography – unit resolution mass spectrometry

Executive Summary

This study on chemical contaminants in shellfish from Scottish classified shellfish production areas, fulfils part of the requirements of EU member states (EU Regulations (EC) No.1881/2006 and (EC) No. 854/2004) to adopt appropriate monitoring measures and carry out compliance checks on shellfish produced for human consumption. In comparison to earlier years, the scope of this study was widened to include production areas that had not been tested before. Marine shellfish bio-accumulate environmental contaminants because of their inability to metabolise these during feeding. The study determines concentrations of regulated environmental contaminants in the flesh of edible species with a view to determine current levels of occurrence and to allow estimation of consumer exposure.

The study analysed 56 composite samples of shellfish including mussels, Pacific oysters, cockles, native oysters, queen scallop, razor clams, wedge clams and surf clams, for polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/Fs, dioxins), polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs) and heavy metals. The methodologies used for the analyses were UKAS accredited to the ISO 17025 standard and follow EU commission regulations for data quality criteria.

The highest observed levels of the currently regulated PAHs, benzo[a]pyrene at 5.6 µg/kg, and PAH 4 at 23.3 µg/kg compare to the maximum permitted level (MPL) of 5 µg/kg and 30 µg/kg respectively (Regulation (EC) No. 835/2011). Subsequent re-sampling at the same site at which this benzo[a]pyrene level was observed, returned benzo[a]pyrene and PAH 4 values of 2.6 µg/kg and 12.4 µg/kg, respectively for the same species of shellfish. In the case of PCDD/Fs and PCBs in particular, contaminant concentrations were all below the regulatory maximum levels (Regulation (EU) No. 1259/2011), and this level of occurrence is unlikely to pose a risk to public health. Similarly, the concentrations of the regulated heavy metals, mercury, cadmium and lead which showed a maximum value of 0.77 mg/kg, for lead, were below the set maximum limits (1.5 mg/kg for lead - Commission Regulation (EC) No. 1881/2006 as amended). Although the contaminant profiles from the current study are similar to the previous year's data, there is some elevation of concentrations observed for some of the contaminants (in particular for PAHs, but for PCDD/Fs and PCBs as well). This may be attributable to the wider range of sites monitored, or the period of sampling, in the current year's study

The data contained in this report has also been issued as individual test reports for each of the relevant shellfish producing area local authorities.

1. Study Background

Marine shellfish are an excellent source of protein, are high in essential minerals, and low in calories and fat. In many parts of the UK and in Scotland in particular, the shellfish industry makes a significant contribution to the local economy. Shellfish have a recognised potential for bio-accumulating contaminants and some bivalve species such as mussels, are commonly used as early indicators of local pollution. Bivalves feed by filtering plankton from the surrounding water that washes through their habitat. This feeding mechanism leads to the bio-accumulation of pollutants of biogenic and anthropogenic origin such as polychlorinated dibenzo-*p*-dioxins (PCDDs), polychlorinated dibenzofurans (PCDFs), polychlorinated biphenyls (PCBs), heavy metals (trace elements) and polycyclic aromatic hydrocarbons (PAHs), from the surrounding waters. The bio-accumulation potential of the shellfish species used for food is particularly relevant in the case of environmental contaminants with long half-lives such as chlorinated dioxins and PCBs. These contaminants have been the subject of a number of studies (Garraud et al 2007, Lee et al 2007, Fernandes et al 2009, Fernandes et al 2012) relating to the occurrence and bio-accumulation in marine species and the resulting potential for human exposure arising from the consumption of the edible species.

In recognising the requirements of food safety, the EU has for a number of years, defined regulation for the control of these contaminants in a range of foods including shellfish. (Commission Regulation (EC) No 1259/2011, Commission Regulation (EU) No 835/2011, Commission Regulation (EC) No 333/2007). Some of the regulations specify new requirements on the controls expected by the competent authority (Food Standards Agency) with respect to classified shellfish production areas. EU member states are required to adopt appropriate monitoring measures and carry out compliance checks with regard to the occurrence of these contaminants in shellfish produced for human consumption.

PCDD/Fs and PCBs are recognised environmental and food contaminants that are known to bio-accumulate in fish and shellfish. The extent of this accumulation is evident by the levels of these contaminants detected in various studies. In the UK, Total Diet Studies (TDS) (FSA 2003) carried out over the last 2 decades, fish (including shellfish) has consistently been one of the highest dioxin and PCB containing food groups. Human dietary exposure can therefore be significantly influenced by the fish and shellfish component of the diet, particularly in high level consumers and low body-weight individuals.

Although metabolised in many fish species, PAHs persist in shellfish as filter feeding species appear unable to effect bio-transformation of these contaminants. Other than this bio-accumulation pathway, PAHs can also arise in fish and shellfish through some food preparation and processing methods – e.g. smoked fish are known to contain elevated levels of PAHs. Some PAH compounds have been shown to be genotoxic and carcinogenic, the most studied of which (benzo[a]pyrene, or B[a]P) is regulated in a range of foods including shellfish, within the EU (SCF Opinion 2002, Commission Regulation (EC) No. 208/2005). However, more recent evaluation by EFSA's CONTAM panel, concluded that a set of 4 compounds, namely benzo[a]pyrene, chrysene, benz[a]anthracene and benzo[b]fluoranthene (collectively referred to as PAH4) were more suitable indicators of PAH toxicity in food (EFSA, 2008). These four compounds were subsequently included in the updated Commission Regulation (EC) No. 835/2011, which came into force from September 2012. In a study on bivalve molluscs including mussels, oysters and scallops, the FSA reported positive detection of most PAH compounds in samples taken in England and Wales (FSA 2005). However in comparison to a study carried out about a decade earlier, reported levels were significantly lower and no sample showed levels above the 5 µg/kg EU limit for B[a]P in shellfish.

Some trace elements and in particular, heavy metals are established toxic contaminants. Some elements, such as copper, chromium, selenium and zinc are essential to health but may be toxic at high levels of exposure. Metals and other elements may enter marine and aquatic environments and bio-accumulate in species at any point during growth and harvesting. Some potentially toxic elements occur naturally as part of the local geology, but others may also be found in the location of certain industries, as a result of unauthorised discharge, or as a result of other anthropogenic activity.

As part of its monitoring requirements in support of EU regulations, the FSA in Scotland has overseen the collection of shellfish each year, from classified shellfish production sites within relevant local authority areas in Scotland. In comparison to previous years, the present study has been extended to sites that were not included in earlier chemical contaminant testing. The production sites are required to monitor shellfish samples, with the edible tissues analysed for the contaminants described above, as specified in Commission Regulation (EU) No. 252/2012. The analysis is carried out at the Food and Environment Research Agency (FERA) in York.

FERA is an executive agency of the UK Government's Department for Environment, Food and Rural affairs (DEFRA). In the current context, FERA has generated environmental contaminant data to FSA Scotland, on shellfish collected from new and existing shellfish sites since 2007. This report collates the results of the individual analyses for dioxins, PAHs and heavy metals in samples of shellfish collected from Scottish sites in the first quarter of 2013.

2. Methodology

2.1 Sample Collection and Preparation

56 samples (individual subsamples from each site were composited) of shellfish, including species such as common mussels, Pacific oysters, common cockles, surf clams, queen scallop, wedge clams, native oysters and razor clams were collected during January to March 2013. The sampling period was timed to coincide with the period of optimal contaminant concentrations in the shellfish. A single sample of wedge clams was re-sampled in early July 2013, as a follow-up to the sample collected in mid-February.

Details on the locations, with descriptions of the samples and identification are given in Table 1. The broad geographical distribution of Scottish shellfish production areas is given in Figure 1.

On receipt at the laboratory each sample was given a unique laboratory reference number and the sample details were logged into a database. The samples were stored frozen prior to analysis. Sample preparation consisted of shelling followed by compositing of individual sub-samples. The composites were thoroughly homogenised and aliquots taken for PAH and heavy metal analysis, prior to freeze-drying. Freeze-dried sample powders were re-homogenised and aliquots used for dioxin and PCB analysis.

2.2 Contaminants measured – Specific Analytes

The following analytes were determined: Regulated contaminants are highlighted in **bold**.

Dioxins - all 17, 2378-Cl substituted PCDDs and PCDFs.

Dioxin-like PCBs - IUPAC no. 77, 81, 105, 114, 118, 123, 126, 156, 157, 167, 169 and 189.

Non Dioxin-like PCBs - IUPAC numbers 18, **28**, 31, 47, 49, 51, **52**, 99, **101**, 128, **138**, **153** and **180**.

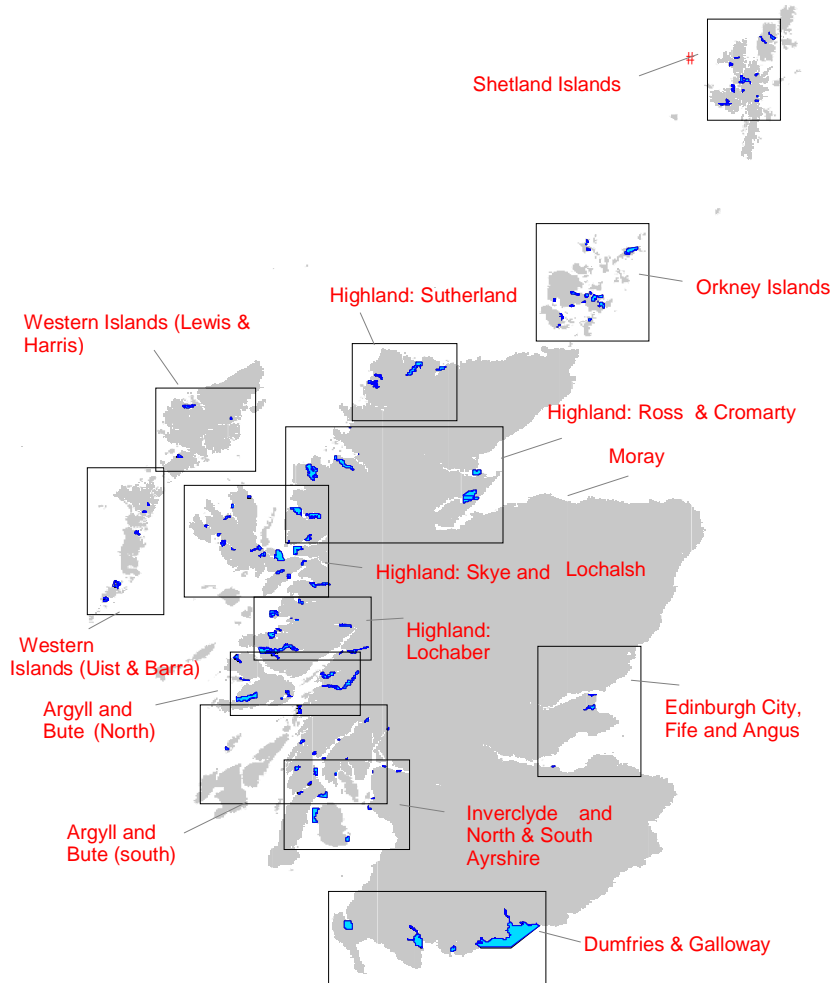
PAHs -

acenaphthene, acenaphthylene, fluorene, phenanthrene, anthracene, fluoranthene, benzo[c]fluorene, pyrene, benzo[e]pyrene, benzo[b]naphtho[2,1-d]thiophene, anthanthrene, coronene, benzo[ghi]fluoranthene, **benz[a]anthracene**, **chrysene**, **benzo[b]fluoranthene**, benzo[j]fluoranthene, benzo[k]fluoranthene, **benzo[a]pyrene**, cyclopenta[c,d]pyrene, indeno[123cd]pyrene, dibenzo[ah]anthracene, benzo[ghi]perylene, dibenzo[al]pyrene, dibenzo[ae]pyrene, dibenzo[ai]pyrene, dibenzo[ah]pyrene and the substituted PAH, 5-methylchrysene.

Heavy Metals – Chromium (Cr), Manganese (Mn), Cobalt (Co), Nickel (Ni), Copper (Cu), Zinc (Zn), Arsenic (As), Selenium (Se), Silver (Ag), **Cadmium (Cd)**, **Mercury (Hg)**, **Lead (Pb)**

Figure 1: Shellfish Production Areas that have been monitored since 2006

(Additional sites were tested in 2013)



2.3 PCDD/F and PCB - Analytical Methodology

(FERA (UK NRL) SOPs FSG 453-460)

The method used for the preparation, extraction and analysis of samples has been reported previously (Fernandes et al 2004) and is part of the CEN EN16215:2012 standard. In brief, samples were fortified with ¹³C-labelled analogues of target compounds and exhaustively extracted using mixed organic solvents. Ortho substituted PCBs were separated from non-ortho substituted PCBs and PCDD/Fs by fractionation on activated carbon. The two fractions were further purified using adsorption chromatography on alumina. Analytical measurement was carried out using high resolution gas chromatography-high resolution mass spectrometry (HRGC-HRMS) for the seventeen, 2,3,7,8-Cl substituted PCDD/F congeners and non-ortho substituted PCBs. HRGC-unit resolution mass spectrometry (HRGC-LRMS) was used for the measurement of the ortho substituted PCBs.

All analyses were UKAS accredited to ISO 17025 standards, with the inclusion of reference material and method blanks which were evaluated prior to reporting. Further quality assurance measures included the successful participation in international inter-comparison exercises such as Dioxins in Food-2011 and Dioxins in Food-2012, on dioxins and dioxin-like PCBs. Quality control evaluation for the accompanying data follows the criteria specified for chlorinated dioxins and PCBs (Commission Regulation (EU) No 252/2012). In addition, as NRL for chemical contaminants, FERA participates in PT exercises and other inter-laboratory exercises as organised by the EU-RL.

2.4 Polycyclic Aromatic Hydrocarbons (PAH) - Analytical Methodology

(FERA (UK NRL) SOP FSG 410)

The analytical methodology for the PAHs has been reported before (Rose et al, 2007) and is based on internal standardisation with GC-MS measurement. An aliquot of the homogenised sample was fortified with ¹³C-labelled analogues of target compounds and saponified with methanolic potassium hydroxide. The extracted PAH solutions were purified in two stages with a DMF/cyclohexane partition followed by adsorption chromatography on activated silica. Purified extracts were sensitivity standardised and measured using high resolution gas chromatography-unit resolution mass spectrometry.

The analytical procedure for PAHs is UKAS accredited to the ISO 17025 standard and includes the assessment of method blanks and reference materials, (e.g. T0651, PAHs in palm oil) for compliance with the accreditation criteria. The methodology also meets the criteria required for

evaluating data against the maximum permitted limits for benzo[a]pyrene as specified in EU Commission Regulations. FERA regularly participates in FAPAS PT exercises for PAHs in food. In addition, as NRL for chemical contaminants, FERA participates in PT exercises and other inter-laboratory exercises as organised by the EU-RL.

2.5 Trace Elements - Analytical Methodology

(FERA (UK NRL) SOP FSG 454 and 457)

Aliquots of the homogenised sample were weighed into allotted quartz digestion vessels and a mixture (4:1) of nitric acid and hydrochloric acid added. The vessels were sealed and the contents digested using a high pressure microwave digestion system. Reagent blanks, certified reference materials and a spiked blank were also taken through the procedure. The resulting solutions were transferred to pre-marked acid-clean plastic test tubes and diluted to 10 ml with deionised water. The digest solutions together with a set of standards covering the expected concentration range, were internally standardised with indium or rhodium in dilute nitric acid (1 %v/v). Measurements were made using an Agilent 7500ce ICP-MS with collision cell.

In common with the other two sets of analyses, the analytical procedure is accredited to the ISO17025 standard. The criteria used to assess data included checks on instrument drift, spike recovery, replicate agreement, limits of detection and certified reference material values. Regular, successful participation in FAPAS inter-comparison exercises provides further confidence in the data. In addition, as NRL for chemical contaminants, FERA participates in PT exercises and other inter-laboratory exercises as organised by the EU-RL.

Table 1: Overview of samples

Local Authority	Production area	Site name	Collection period	Species	GR or *NGR for sample	OEC no.
Argyll & Bute	Campbeltown Loch	Kildalloig Bay (AB-029-008-04)	16.01.2013	Common cockles	NR74855 19889	21176
	Loch A Chumhainn: Inner Deep Site	Inner Deep Site (AB-112-017-13)	15.01.2013	Pacific oysters	NM40927 53282	21168
	Loch Creran Upper Oysters	East - Barrington (AB-129-021-13)	27.02.2013	Pacific oysters	NM94849 43234	21268
	Loch Fyne: Ardkinglas Oysters	Policy Gates (AB-147-034-13)	12.02.2013	Pacific oysters	NN17412 10534	21238
	Loch Fyne: Otter Ferry	Balliemore (AB-151-039-13)	18.02.2013	Pacific oysters	NR 91992 83403	21248
	Loch Fyne: Stonefield	North Bay (AB-154-043-15)	27.02.2013	Queen Scallops	NR86492 72266	21273
	Loch Melfort	Loch Melfort (AB-178-051-08)	21.01.2013	Common mussels	NM80597 11129	21187
	Loch Na Keal	Eilean Liath (AB-284-080-13)	15.01.2013	Pacific oysters	NM47421 39289	21162
	Loch Spelve: Croggan Pier	Croggan Pier (AB-199-055-13)	12.02.2013	Pacific oysters	NM70778 27338	21236
	Loch Spelve: Invertussa	Site 1 (AB-200-057-08)	12.02.2013	Common mussels	NM70269 30187	21237
Loch Na Cille	AB-617-1204-04	13.02.2013	Common cockles	NM 84153 12543	21242	
Comhairle nan Eilean Siar Lewis & Harris	East Loch Tarbert	Sound of Scalpay (LH-057-106-08)	16.01.2013	Common mussels	NG2239 9758	21172
	Loch Erisort: Garbh Eilean	Garbh Eilean (LH-357-747-08)	11.02.2013	Common mussels	NB3659 2129	21234
	Loch Roag: Barraglom	Loch Barraglom (LH-185-120-08)	19.02.2013	Common mussels	NS16673414	21253
	Loch Roag: Miavaig	Miavaig (LH-188-123-08)	19.02.2013	Common mussels	NS09883421	21252
	Loch Roag: Torranish	Loch Torranish (LH-189-124-08)	19.02.2013	Common mussels	NB1550 3369	21254
	Northton Beach	Northton Beach LH-531-964-04	15.01.2013	Common cockles	NF98429204	21173
Comhairle nan Eilean Siar Uist & Barra	North Uist 2	Lochmaddy (UB-540-969-08)	21.01.2013	Common mussels	NF9373 7112	21186
	South Uist 1	Loch Skipport East (UB-537-966-08)	15.01.2013	Common mussels	NF84353914	21175
	Traigh Cille Bharra Cockles	Traigh Cille Bharra (UB-392-790-04)	14.01.2013	Common cockles	NF71300680	21161

Local Authority	Production area	Site name	Collection period	Species	GR or *NGR for sample	OEC no.
Dumfries & Galloway	Fleet Bay	Fleet Bay South (DG-628 124 08)	14.01.2013	&Common cockles	NX5749 5005	21157
Fife	Forth Estuary: Anstruther	Anstruther (FF-068-184-19)	15.01.2013	Surf clams	*NO59300450	21170
	Forth Estuary: Largo Bay	Largo Bay (FF-072-188-16)	14.01.2013	Razors	*Representative monitoring zone - Area bounded by lines drawn between; NO 4100 0180 NO 4200 0180 NO 4200 0150 NO 4100 0150	21169
	Forth Estuary: Pittenweem	Pittenweem Surfs(FF-073-819-19)	15.01.2013	Surf clams	*Representative monitoring zone - Area bounded by lines drawn between; NO 5374 0188 NO 5373 0160 NO 5676 0206 NO 5669 0234	21171
Highland: Lochaber	Glenug Bay	Glenug Bay (HL-075-205-08)	23.01.2013	Common mussels	NM67039 77927	21188
	Loch Ailort	Eilean Dubh (HL-114-937-08)	15.01.2013	Common mussels	NM74757 81799	21165
	Loch Ailort 1	Site 1 - Muckairn Mussels (HL-114-214-08)	15.01.2013	Common mussels	NM72639 79525	21166
	Loch Ailort 2	Ephesus Bay (HL-539-968-12)	14.01.2013	Native oysters	NM72483 78775	21167
	Loch Eil: Eil	Loch Eil (HL-135-218-08)	Not received	Common mussels	*NN05967729	-
	Loch Leven: Lower	Lower (HL-170-222-08)	Not received	Common mussels	*NN07105910	-
	Loch Leven: Upper	Upper (HL-171-223-08)	27.02.2013	Common mussels	NN14786 61687	21274
	Loch Eil: Fassfern	Fassfern (HL-136-219-08)	12.02.2013	Common mussels	NN02933 78120	21239
Highland: Ross & Cromarty	Loch Kishorn North Oysters	Loch Kishorn (RC-329-254-13)	25.02.2013	Pacific oysters	NG82835 40275	21267
	Cromarty Bay West	RC-623-1225-13	26.02.2013	Pacific oysters	NH73787 65656	21275
Highland: Skye & Lochalsh	Loch Eishort	Drumfearn (SL-137-281-08)	22.01.2013	Common mussels	NG6675 1629	21184
Highland: Sutherland	Dornoch Firth 2	Meikle Ferry (HS-466-876-08)	21.01.2013	Common mussels	*NH72608580	21183
	Kyle of Tongue	Kyle of Tongue (HS-103-303-13)	12.02.2013	Pacific oysters	NC59325902	21235

Local Authority	Production area	Site name	Collection period	Species	GR or *NGR for sample	OEC no.
North Ayrshire	Arran: Pirnmill	Pirnmill (NA-008-330-16)	15.01.2013	Razors	*NR87004400	21177
	Stevenson Sands	Stevenson Sands (NA-207-1238-23)	20.02.2013 and 08.07.2013	Wedge Clams	*Representative monitoring zone - Area bounded by lines drawn between; NS 2660 4025, NS 2740 3980, NS 2710 3940, NS 2630 3983, NS 2660 4025	21255 and 21469
Orkney Islands	Fersness Bay	Fersness Razors (OI-455-859-16)	02.04.2013	Razors	HY 55203770	21341
Shetland Islands	Baltasound Oysters	Baltasound (SI-010-394-13)	15.01.2013	Pacific oysters	HP6232 0846	21164
	Basta Voe Cove	Inner - Site 2 - Nisbet (SI-324-400-08)	05.02.2013	Common mussels	HU5224 9729	21213
	Busta Voe Lee South	Greentaing (SI-328-767-08)	14.01.2013	Common mussels	HU3441 6425	21158
	Clift Sound: Stream Sound	Stream Sound (SI-037-415-08)	23.01.2013	Common mussels	HU3940 3454	21200
	Clift Sound: Whal Wick	Whal Wick (SI-038-416-08)	23.01.2013	Common mussels	HU40223616	21201
	Dales Voe: Scarvar Ayre	Scarvar Ayre (SI-050-420-08)	14.01.2013	Common mussels	HU4224 6991	21160
	East Firth	Site 1 (SI-379-769-08)	12.02.2013	Common mussels	HU3437 5125	21243
	Gruting Voe: Browland Voe	Browland Voe (SI-081-425-08)	16.01.2013	Common mussels	HU2666 4969	21179
	Gruting Voe: Seli Voe	Seli Voe (SI-084-428-08)	29.01.2013	Common mussels	HU2814 4799	21205
	Lang Sound	Lang Sound (SI-107-429-08)	12.02.2013	Common mussels	HU37903415	21241
	Ronas Voe	West Of Black Well (SI-522-918-08)	14.01.2013	Common mussels	HU2908 8188	21159
	South of Houss Holm	South of Houss Holm (SI-261-444-08)	21.01.2013	Common mussels	HU 3736 3074	21185
	South Uyea	South (SI-263-454-08)	15.01.2013	Common mussels	HU6071 9808	21163
	Vaila Sound Linga	Linga (SI-288-457-08)	16.01.2013	Common mussels	HU2409 4827	21178
	Vementry North	Suthra Voe West (SI-322-464-08)	12.02.2013	Common mussels	HU2919 6024	21240
Weisdale Voe	North Flotta (SI-297-469-08)	18.02.2013	Common mussels	HU3807 4650	21249	
Papa Little Voe	SI-235-440-08	11.02.2013	Common mussels	HU 3407 6015	21233	
South Ayrshire	North Bay	Barassie (SA-337-719-16)	19.02.2013	Razors	*NS31833419	21251

& not currently classified- mussels used as indicator

3. Results

Analyte concentrations are presented in Tables 3.1 to 3.6. Concentration units reflect current convention as required by regulation, and data were rounded to two decimal places or as appropriate. The reporting limits (quoted as “<”) for dioxins, PCBs and PAHs are estimated as a dynamic parameter and therefore represent the limits of determination that prevail during the course of the measurement. For PCDD/Fs, PCBs, metals and PAHs, the reporting limits are consistent with the requirements of EU regulations. Data on the reference materials that were analysed concurrently with the samples, were within established acceptable limits, and are available if required.

In addition to the concentration of individual congeners, the dioxin-like toxicity of the samples arising from PCDD/Fs and dioxin-like PCBs has also been reported as a toxic equivalent (WHO-TEQ), which is calculated by multiplying the concentration of each congener of interest by its toxicity equivalency factor (WHO-TEF). The TEQs are presented in terms of the 2005 TEFs (van den Berg et al 2006). Additionally as per the requirements of Regulation 1259/2011, the sum of the ICES-6 PCBs is also provided. The regulations for shellfish are based on whole weight concentrations; however in keeping with previous reports, the results for PCDD/Fs and PCBs have also been reported on a fat weight basis.

PCDD/Fs and PCBs were detected in all the shellfish samples at varying concentrations. The data are broadly consistent with the results of monitoring from previous years (e.g. the average PCDD/F and PCB TEQ at 0.12 ng/kg in 2013 was a little elevated compared to 0.09 ng/kg in 2012), although the maximum value observed (0.32ng TEQ/kg) was almost double the maximum (0.17 ng TEQ/kg) for 2012. Maxima in both years occurred in samples of Pacific oysters. As observed in earlier studies on shellfish in the UK, PCDD/Fs generally made a proportionately greater contribution to the TEQ than the PCBs, apart from a set of samples (mussels and oysters) from Shetland, which showed higher levels of PCB TEQ. This may be indicative of the local contamination profile. As there were different numbers of samples of the individual species, and a limited data set, it would be inappropriate to compare concentrations across the species, but the data indicate lower contamination levels in cockles. For all samples, the detected concentrations were comfortably below the regulatory limits for PCDD/F and dioxin-like PCB TEQ, and the ICES-6 PCBs.

PAHs were detected in all the shellfish analysed. Phenanthrene, fluoranthene, pyrene, benzo(b)fluoranthene and benzo(e)pyrene were generally the compounds that occurred to the greatest extent in the samples studied. Among the toxicologically significant compounds

highlighted by the SCF (SCF 2002), some of the higher molecular weight PAHs (anthanthrene, dibenzopyrenes) were generally not detectable (typically < 0.1 µg/kg). The concentrations of benzo[a]pyrene detected in the samples did not exceed the maximum limits specified in EU regulations (Commission regulation (EC) No. 835/2011), apart from a single sample of wedge clams which showed a concentration of 5.6 µg/kg which was proximate to the maximum limit of 5 µg/kg. A similar sample taken later in the year, from the same site, showed a benzo[a]pyrene concentration of 2.6 µg/kg. The highest concentration of PAH4 detected (23.3 µg/kg for a sample of razor clams), was below the maximum limit of 30 µg/kg. The patterns of occurrence are consistent with the results of monitoring in previous years, but in a manner similar to the PCDD/Fs and PCBs, the current range of occurrence for PAH4 (0.49 – 23.3 µg/kg, mean 4.2 µg/kg) is elevated in comparison to the range observed for the previous year (0.43 – 3.89 µg/kg mean 1.7 µg/kg).

Apart from silver (Ag), which was below the limit of quantitation in some cases, all samples showed the presence of heavy metals. Some metals such as manganese (Mn), zinc (Zn), copper (Cu), and arsenic (As) occurred at higher concentrations, and the oyster samples in particular showed significantly higher concentrations of Cu (maximum value of 12.1 mg/kg) and Zn (maximum value of 607 mg/kg). Apart from the higher concentration of Zn detected in a few samples, the data is consistent with the results of previous years monitoring, The occurrence of the three regulated metals (Commission Regulation EC 1881/2006 as amended by 629/2008) - Mercury (Hg), Cadmium (Cd) and Lead (Pb), were below the regulated maximum limits of 0.5 mg/kg 1.0 mg/kg and 1.5 mg/kg respectively.

In very general terms, the patterns of occurrence across the three classes of contaminants were consistent with those recorded for earlier years. Some contaminants, PCDD/F and PCBs, and in particular, PAHs, do show a comparative elevation in concentrations. This may be due to the larger numbers of samples collected, but may also be due to the period during which sampling was carried out.

4. Conclusions

In general terms the results of the 2013 monitoring for dioxins and PCBs, PAHs and heavy metals, are similar to the previous year's data, with some elevation of concentrations observed, particularly for PAHs and PCDD/Fs and PCBs. This may be attributable to the wider range of sites monitored, or the period of sampling, in the current year's study.

For the majority of samples, the concentrations of regulated contaminants were below the regulatory maximum levels. Some shellfish showed benzo[a]pyrene concentrations that were proximate to the maximum limit of 5 µg/kg, in particular, a single sample of wedge clams.

Further analysis of the data in conjunction with details such as the sampling locations and times, would yield information on the spatial distribution of the contaminants, and may allow further conclusions on the study, but this is outside the scope of the current project.

Table 3.1 PCDD/Fs (dioxins) concentrations (Whole weight)

FERA Sample No.	21157	21158	21159	21160	21161	21162	21163	21164	21165
FERA LIMS No.	S13-000817	S13-000818	S13-000819	S13-000820	S13-000855	S13-000856	S13-000857	S13-000858	S13-000859
Sample Details:	Mussels, Production Area: Fleet Bay, Site Name: Fleet Bay	Common Mussels, Production Area: Busta Voe Lee South, Site Name: Greentaing,	Common Mussels, Production Area: Ronas Voe Mussels 2, Site Name: West of Blackwell	Common Mussels, Production Area: Dales Voe: Scarvar Ayre, Site Name: Scarvar Ayre,	Cockles, Prod Area: Traigh Cille Bhana, Site Name: Traigh Cille Bhana Cockles	Pacific Oysters, Prod Area: Loch Na Keal, Site Name: Eilean Liath	Common Mussels, Production Name: South Uyea, Site Name: South	Pacific Oysters, Prod Area: Baltasound Oysters, Site Name: Baltasound	Common Mussels, Prod Area: Loch Ailort, Site Name: Eilean Dubh
Whole weight									
ng/kg									
2,3,7,8-TCDD	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1,2,3,7,8-PeCDD	0.03	0.02	<0.01	0.02	<0.01	0.03i	0.01	0.01i	0.01i
1,2,3,4,7,8-HxCDD	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1,2,3,6,7,8-HxCDD	0.03	0.02	<0.01	0.02	<0.01	0.02	0.02	0.01	0.01
1,2,3,7,8,9-HxCDD	0.02	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01
1,2,3,4,6,7,8-HpCDD	0.23	0.06	0.03	0.06	0.02	0.03	0.04	0.01	0.07
OCDD	1.09	0.17	0.07	0.14	0.07	0.14	0.22	0.03	0.22
2,3,7,8-TCDF	0.18	0.11	0.07	0.14	<0.01	0.14	0.07	0.14	0.09
1,2,3,7,8-PeCDF	0.04	0.02	0.01	0.02	<0.01	0.02	0.01	0.02	0.02
2,3,4,7,8-PeCDF	0.09	0.06	0.03	0.07	<0.01	0.05	0.04	0.05	0.04
1,2,3,4,7,8-HxCDF	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1,2,3,6,7,8-HxCDF	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1,2,3,7,8,9-HxCDF	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
2,3,4,6,7,8-HxCDF	0.03	0.02	<0.01	0.02	<0.01	0.02	<0.01	0.01	0.01
1,2,3,4,6,7,8-HpCDF	0.06	0.02	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	0.01
1,2,3,4,7,8,9-HpCDF	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
OCDF	0.1	0.02	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	0.02
WHO-TEQ 2005 (ng/kg)									
lower	0.09	0.05	0.02	0.06	<0.01	0.06	0.03	0.04	0.03
upper	0.10	0.07	0.04	0.08	0.03	0.08	0.05	0.06	0.05

i - indicative

FERA Sample No.	21166	21167	21168	21169	21170	21171	21172	21173	21175
FERA LIMS No.	S13-000860	S13-000861	S13-000862	S13-000863	S13-000864	S13-000865	S13-000942	S13-000943	S13-000944
Sample Details:	Common Mussels, Prod Area: Loch Ailort 1, Site Name: Site 1	Native Oysters, Prod Area: Loch Ailort 2, Site Name: Ephesus Bay	Pacific Oysters, Prod Area: Loch A Chumhainn, Site Name: Inner Deep Site	Razors, Prod Area: Forth Estuary Largo Bay, Site Name: LargoBay	Surf Clams, Prod Area: Forth Estuary Anstruther, Site Name: Anstruther	Surf Clams, Prod Area: Forth Estuary Pittenweem, Site Name: Pittenweem	Common Mussels, Prod Area: E Loch Tarbenn, Site Name: Sound of Scalpy	Common Cockles, Prod Area: Northton Beach, Site Name: Northton	Mussels, Prod Area: South Uist 1, Site Name: Loch Skipport

Whole weight

ng/kg									
2,3,7,8-TCDD	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1,2,3,7,8-PeCDD	0.02	0.07	0.01	0.02i	0.02i	0.01	0.01	<0.01	0.02i
1,2,3,4,7,8-HxCDD	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1,2,3,6,7,8-HxCDD	0.01i	0.01	<0.01	0.02	0.02i	0.01i	0.02	<0.01	<0.01
1,2,3,7,8,9-HxCDD	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	0.01	<0.01	<0.01
1,2,3,4,6,7,8-HpCDD	0.08	0.01	0.01	0.2	0.17	0.17	0.11	0.03	0.04
OCDD	0.27	0.05	0.05	0.69	0.70	0.72	0.67	0.14	0.19
2,3,7,8-TCDF	0.1	0.09	0.06	0.13	0.03	0.03	0.07	<0.01	0.04
1,2,3,7,8-PeCDF	0.02	0.01	<0.01	0.02	0.05	0.03	0.02	<0.01	<0.01
2,3,4,7,8-PeCDF	0.04	0.04	0.02	0.04	0.04	0.04	0.04	<0.01	0.02
1,2,3,4,7,8-HxCDF	<0.01	<0.01	<0.01	0.01	0.01i	0.01i	<0.01	<0.01	<0.01
1,2,3,6,7,8-HxCDF	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1,2,3,7,8,9-HxCDF	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
2,3,4,6,7,8-HxCDF	0.01	<0.01	<0.01	0.01	0.01	0.01	0.01	<0.01	<0.01
1,2,3,4,6,7,8-HpCDF	0.02	<0.01	<0.01	0.05	0.06	0.06	0.02	0.01	<0.01
1,2,3,4,7,8,9-HpCDF	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
OCDF	0.02	<0.01	<0.01	0.05	0.07	0.07	0.02	<0.01	<0.01
WHO-TEQ 2005 (ng/kg)									
lower	0.05	0.12	0.02	0.05	0.04	0.03	0.04	<0.01	0.03
upper	0.06	0.13	0.04	0.07	0.06	0.05	0.05	0.03	0.05

i - indicative

FERA Sample No.	21176	21177	21178	21179	21183	21184	21185	21186	21187	21188	21200
FERA LIMS No.	S13-000945	S13-000946	S13-000947	S13-000948	S13-001060	S13-001061	S13-001062	S13-001063	S13-001064	S13-001118	S13-001138
Sample Details:	Common Cockles, Prod Area: Campbeltown Loch, Site Name: Kildalloig Bay	Razors, Prod Area; Pirnmill, Site Name: Pirnmill	Common Mussels, Prod Area: Vaila Sound Site Name: Linga	Common Mussels, Prod Area: Gruting Voe Browland Voe, Site name: Browland Voe	Fresh Mussels, Prod Area: Dornoch Firth, Site Name: Miekle Ferry	Mussels, Prod Area: Loch Eishort, Site Name: Drunfearn	Common Mussels, Prod Area: South of Houss Holm	Mussels, Prod Area: North Uist 2, Site Name: Lochmaddy	Common Mussels, Prod Area: Loch Melfort, Site: Loch Melfort	Common Mussels, Prod Area: Glenuig Bay, Site Name: Glenuig Bay	Common Mussels, Prod Area: Clift Sound, Site Name: Stream Sound
Whole weight											
ng/kg											
2,3,7,8-TCDD	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1,2,3,7,8-PeCDD	<0.01	0.01	0.02	<0.01	<0.01	<0.01	0.01	<0.01	0.02	0.01	0.01i
1,2,3,4,7,8-HxCDD	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1,2,3,6,7,8-HxCDD	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01
1,2,3,7,8,9-HxCDD	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1,2,3,4,6,7,8-HpCDD	0.06	0.1	0.04	0.02	0.04	0.03	0.04	0.04	0.06	0.07	0.04
OCDD	0.26	0.47	0.11	0.06	0.22	0.15	0.11	0.16	0.19	0.28	0.12
2,3,7,8-TCDF	0.04	0.28	0.08	0.04	0.02	0.03	0.07	0.04	0.1	0.07	0.11
1,2,3,7,8-PeCDF	0.01	0.02	0.02	<0.01	<0.01	<0.01	0.01	<0.01	0.02	0.01	0.02
2,3,4,7,8-PeCDF	0.02	0.09	0.04	0.02	0.01	0.01	0.03	0.02	0.04	0.03	0.04
1,2,3,4,7,8-HxCDF	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01
1,2,3,6,7,8-HxCDF	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1,2,3,7,8,9-HxCDF	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
2,3,4,6,7,8-HxCDF	0.01	0.02	0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.01	0.01	0.01
1,2,3,4,6,7,8-HpCDF	0.02	0.04	0.01	<0.01	0.02	<0.01	0.01	<0.01	0.01	0.02	<0.01
1,2,3,4,7,8,9-HpCDF	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
OCDF	0.02	0.04	0.01	<0.01	0.02	<0.01	0.01	<0.01	0.02	0.03	0.01
WHO-TEQ 2005 (ng/kg)											
lower	0.01	0.07	0.04	0.01	0.01	0.01	0.03	0.01	0.05	0.03	0.04
upper	0.04	0.09	0.06	0.04	0.03	0.03	0.04	0.04	0.06	0.04	0.05
i - indicative											

FERA Sample No.	21201	21205	21213	21235	21236	21237	21238	21239	21240	21241	21233
FERA LIMS No.	S13-001139	S13-003272	S13-003776	S13-004096	S13-004097	S13-004098	S13-004099	S13-004100	S13-004101	S13-004102	S13-003917
Sample Details:	Common Mussels, Prod Area: Clift Sound, Whalwick, Site Name: Whalwick	Common Mussels, Prod Area: Gruting Voe, Site Name: Selivoe	Common Mussels, Prod Area: Basta Voe Cove, Site Name: Inner Site 2	Pacific Oysters, Prod Area: Kyle of Tongue, Site Name: Kyle of Tongue	Pacific Oysters, Prod Area: Loch Spelve, Croggan Pier, Site Name: Croggan Pier	Common Mussels, Prod Area: Loch Spelve, Inverlussa, Site Name: Site 1	Pacific Oysters, Prod Area: Loch Fyne, Ardkinglas, Site Name: The Point	Common Mussels, Prod Area: Loch Eil Fassfern, Site Name: Fassfern	Common Mussels, Prod Area: Vementry North, Site Name: Suthra Voe West	Common Mussels, Prod Area: Langsound, Site Name: Langsound	Common Mussels, Prod Area: Papa Little Voe, Site Name: Papa Little Voe

Whole weight

ng/kg	21201	21205	21213	21235	21236	21237	21238	21239	21240	21241	21233
2,3,7,8-TCDD	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1,2,3,7,8-PeCDD	0.01i	0.01	0.01	0.03	0.06	0.04	0.03	0.03	0.01i	0.02	0.02i
1,2,3,4,7,8-HxCDD	<0.01	<0.01	<0.01	<0.01	0.02	0.02	0.01	0.02	<0.01	<0.01	<0.01
1,2,3,6,7,8-HxCDD	0.01	0.01	<0.01	0.01	0.05	0.04i	0.03	0.04	<0.01	0.02	0.01
1,2,3,7,8,9-HxCDD	<0.01	<0.01	<0.01	<0.01	0.03	0.02	0.01	0.02	<0.01	<0.01	<0.01
1,2,3,4,6,7,8-HpCDD	0.05	0.03	0.03	0.02	0.06	0.22	0.05	0.18	0.04	0.11	0.06
OCDD	0.15	0.09	0.06	0.09	0.16	0.64	0.12	0.48	0.11	0.29	0.13
2,3,7,8-TCDF	0.13	0.05	0.07	0.17	0.33	0.22i	0.20	0.2	0.04	0.3	0.10
1,2,3,7,8-PeCDF	0.02	0.01	0.01	0.02	0.05	0.05	0.03	0.05	0.01	0.04	0.02
2,3,4,7,8-PeCDF	0.05	0.04	0.04	0.06	0.15	0.12	0.10	0.11	0.03	0.09	0.06
1,2,3,4,7,8-HxCDF	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	0.02	<0.01	0.01	0.01
1,2,3,6,7,8-HxCDF	<0.01	<0.01	<0.01	<0.01	0.02	0.02	0.01	0.02	<0.01	0.01	<0.01
1,2,3,7,8,9-HxCDF	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
2,3,4,6,7,8-HxCDF	0.01	0.01	<0.01	0.01	0.04	0.04	0.03	0.03	0.01	0.03	0.02
1,2,3,4,6,7,8-HpCDF	0.01	0.01	<0.01	<0.01	<0.01	0.05	<0.01	0.03	0.01	0.04	0.02
1,2,3,4,7,8,9-HpCDF	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
OCDF	0.02	0.01	<0.01	<0.01	<0.01	0.06	<0.01	0.04	0.01	0.03	0.02
WHO-TEQ 2005 (ng/kg) lower	0.04	0.03	0.03	0.07	0.18	0.12	0.09	0.10	0.02	0.09	0.05
WHO-TEQ 2005 (ng/kg) upper	0.06	0.04	0.05	0.08	0.18	0.13	0.10	0.11	0.04	0.10	0.07

i - indicative

FERA Sample No.	21234	21242	21243	21248	21249	21251	21252	21253	21254	21255	21267
FERA LIMS No.	S13-003918	S13-004378	S13-004379	S13-004621	S13-004622	S13-004706	S13-004726	S13-004727	S13-004728	S13-004765	S13-005066
Sample Details:	Common Mussels, Prod Area: Loch Erisort, Site Name: Garbh Eilean	Common Cockles, Prod Area: Loch Na Cille, Site Name: Loch Na Cille Cockles	Common Mussels, Prod Area: East Firth, Site Name: Site 1	Pacific Oyster Otter Ferry	Common Mussels Weisdale Voe N Flotta	Production area: North Bay; Site name: Barassie	Common mussel; Prod area: loch Roag Miavaig; Site name: Miauaig	Common mussel; Prod area: loch Roag Barraglom; Site name: loch Barraglom	Common mussel; Prod area: loch Roag Torranish; Site name: loch Torranish	Dredged wedge clams, production area and site name: Stevenston sands	Pacific oyster, Loch Kishorn North oysters
Whole weight											
ng/kg											
2,3,7,8-TCDD	<0.01	<0.01	<0.01	0.02	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1,2,3,7,8-PeCDD	0.01	<0.01	0.02i	0.05	0.02	0.02i	0.02i	0.02i	0.02i	0.01i	0.02i
1,2,3,4,7,8-HxCDD	0.01	<0.01	<0.01	0.01	<0.01	<0.01	0.01	0.02	0.01	0.02	<0.01
1,2,3,6,7,8-HxCDD	0.01	<0.01	0.01	0.04	0.02	0.02	0.02	0.02	0.03	0.04	<0.01
1,2,3,7,8,9-HxCDD	<0.01	<0.01	<0.01	0.02	0.01	<0.01	0.01	0.02	0.02	0.02	0.01
1,2,3,4,6,7,8-HpCDD	0.14	0.03	0.05	0.06	0.1	0.09	0.15	0.2	0.17	0.28	0.03
OCDD	0.76	0.14	0.12	0.13	0.24	0.31	0.73	0.99	0.75	0.92	0.12
2,3,7,8-TCDF	0.06	0.01	0.07	0.55	0.1	0.33	0.07	0.07	0.1	0.1	0.11
1,2,3,7,8-PeCDF	0.02	<0.01	0.01	0.05	0.02	0.02	0.01	0.02	0.02	0.03	0.01
2,3,4,7,8-PeCDF	0.03	<0.01	0.04	0.19	0.05	0.09	0.04	0.05	0.05	0.07	0.04
1,2,3,4,7,8-HxCDF	0.01	<0.01	<0.01	<0.01	0.01	0.02	<0.01	0.02	0.01	0.05	<0.01
1,2,3,6,7,8-HxCDF	<0.01	<0.01	<0.01	0.02	0.01	<0.01	<0.01	0.01	<0.01	0.02	<0.01
1,2,3,7,8,9-HxCDF	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
2,3,4,6,7,8-HxCDF	0.01	<0.01	0.01	0.04	0.02	0.02	0.01	0.02	0.02	0.04	0.01
1,2,3,4,6,7,8-HpCDF	0.04	0.01	0.02	<0.01	0.04	0.04	0.03	0.05	0.04	0.15	<0.01
1,2,3,4,7,8,9-HpCDF	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
OCDF	0.05	0.01	0.02	<0.01	0.04	0.03	0.03	0.04	0.03	0.09	<0.01
WHO-TEQ 2005 (ng/kg) lower	0.03	<0.01	0.04	0.20	0.05	0.10	0.05	0.06	0.06	0.07	0.05
WHO-TEQ 2005 (ng/kg) upper	0.04	0.03	0.06	0.20	0.07	0.10	0.06	0.07	0.07	0.08	0.06

i - indicative

FERA Sample No.	21268	21273	21274	21275	21341
FERA LIMS No.	S13-005067	S13-005206	S13-005207	S13-005208	S13-023932
Sample Details:	Pacific oyster, Loch Creran Upper oysters	Queen scallops, Loch Fyne, Stonefields, North Bay	Common mussel, Loch Leven Upper	Pacific oyster, Comarty Bay West	Razor Shells, Prod Area: Fersness Bay, Site Name: Fersness Razors

Whole weight

ng/kg					
2,3,7,8-TCDD	0.01	0.01	<0.01	<0.01	<0.01
1,2,3,7,8-PeCDD	0.04i	0.05	0.02	0.02	<0.01
1,2,3,4,7,8-HxCDD	0.01	0.02	0.01	<0.01	<0.01
1,2,3,6,7,8-HxCDD	0.02	0.06	0.03	0.01	<0.01
1,2,3,7,8,9-HxCDD	0.02	0.03	0.01	<0.01	<0.01
1,2,3,4,6,7,8-HpCDD	0.04	0.39	0.12	0.03	0.05
OCDD	0.08	1.75	0.40	0.09	0.17
2,3,7,8-TCDF	0.17	0.42	0.09	0.15	0.04
1,2,3,7,8-PeCDF	0.03	0.1	0.12	0.02	<0.01
2,3,4,7,8-PeCDF	0.08	0.12	0.07	0.06	0.01
1,2,3,4,7,8-HxCDF	<0.01	0.02	0.02	<0.01	<0.01
1,2,3,6,7,8-HxCDF	<0.01	0.01	0.01	<0.01	<0.01
1,2,3,7,8,9-HxCDF	<0.01	<0.01	<0.01	<0.01	<0.01
2,3,4,6,7,8-HxCDF	0.02	0.04	0.02	0.01	<0.01
1,2,3,4,6,7,8-HpCDF	<0.01	0.09	0.02	<0.01	0.02
1,2,3,4,7,8,9-HpCDF	<0.01	<0.01	<0.01	<0.01	<0.01
OCDF	<0.01	0.1	0.03	<0.01	0.01
WHO-TEQ 2005 (ng/kg) lower	0.10	0.16	0.07	0.06	0.01
WHO-TEQ 2005 (ng/kg) upper	0.10	0.17	0.08	0.07	0.04

Table 3.1 PCDD/Fs (dioxins) concentrations (Lipid weight)

FERA Sample No.	21157	21158	21159	21160	21161	21162	21163	21164	21165
FERA LIMS No.	S13-000817	S13-000818	S13-000819	S13-000820	S13-000855	S13-000856	S13-000857	S13-000858	S13-000859
Sample Details:	Mussels, Production Area: Fleet Bay, Site Name: Fleet Bay	Common Mussels, Production Area: Busta Voe Lee South, Site Name: Greentaing,	Common Mussels, Production Area: Ronas Voe Mussels 2, Site Name: West of Blackwell	Common Mussels, Production Area: Dales Voe: Scarvar Ayre, Site Name: Scarvar Ayre,	Cockles, Prod Area: Traigh Cille Bhana, Site Name: Traigh Cille Bhana Cockles	Pacific Oysters, Prod Area: Loch Na Keal, Site Name: Eilean Liath	Common Mussels, Production Name: South Uyea, Site Name: South	Pacific Oysters, Prod Area: Baltasound Oysters, Site Name: Baltasound	Common Mussels, Prod Area: Loch Ailort, Site Name: Eilean Dubh
Fat weight									
ng/kg									
2,3,7,8-TCDD	1.03	0.48	0.35	0.57	0.34	0.85	0.3	0.75	0.98
1,2,3,7,8-PeCDD	3.01	1.86	1.31	1.99	0.72i	3.15i	0.97	1.32i	2.01i
1,2,3,4,7,8-HxCDD	1.68	0.7	0.55	0.87	0.58	0.86	0.66	0.41	1.68
1,2,3,6,7,8-HxCDD	3.62	1.62	1.21	1.94	0.92	2.15	1.77	1.16	2.66
1,2,3,7,8,9-HxCDD	2.09	0.83	0.59	0.79	0.89	1.45	0.61	0.63	1.66
1,2,3,4,6,7,8-HpCDD	23.66	5.71	3.92	6.6	7.05	4.2	3.69	1.19	12.11
OCDD	113.8	16.87	9.85	14.62	29.79	17.06	20.06	2.68	40.36
2,3,7,8-TCDF	19.06	11.11	8.98	15.18	3.55	16.87	6.33	12.31	16.6
1,2,3,7,8-PeCDF	4.5	2.39	1.52	2.58	1.38	2.82	1.11	1.34	3.05
2,3,4,7,8-PeCDF	9.26	5.73	4.08	7.64	1.76	6.32	3.21	4.02	8.02
1,2,3,4,7,8-HxCDF	3.2	0.95	0.56	1.05	0.87	0.13	0.61	0.09	1.34
1,2,3,6,7,8-HxCDF	1.4	0.81	0.58	1.0	0.89	1.13	0.58	0.48	1.31
1,2,3,7,8,9-HxCDF	0.25i	0.19	0.06i	0.08i	<0.1	<0.04	0.13	0.09	0.2
2,3,4,6,7,8-HxCDF	2.89	1.8	1.2	2.35	1.11	2.01	0.82	1.11	2.52
1,2,3,4,6,7,8-HpCDF	6.74	1.58	0.89	1.88	2.66	0.92	0.76	0.18	2.58
1,2,3,4,7,8,9-HpCDF	0.9	0.28	0.16	0.29	0.34	0.07	0.1	0.08	0.48
OCDF	10.26	1.76	1.12	2.2	2.2	0.83	0.63	0.25	2.99
WHO-TEQ 2005 (ng/kg)									
lower	10.72	6.01	4.36	7.35	2.62	8.5	3.47	4.96	8.45
upper	10.72	6.01	4.36	7.35	2.63	8.5	3.47	4.96	8.45

i - indicative

FERA Sample No.	21166	21167	21168	21169	21170	21171	21172	21173	21175
FERA LIMS No.	S13-000860	S13-000861	S13-000862	S13-000863	S13-000864	S13-000865	S13-000942	S13-000943	S13-000944
Sample Details:	Common Mussels, Loch Ailort 1, Site Name: Site 1	Native Oysters, Loch Ailort 2, Site Name: Ephesus Bay	Pacific Oysters, Loch A Chumhainn, Site Name: Inner Deep Site	Razors, Prod Area: Forth Estuary Largo Bay, Site Name: LargoBay	Surf Clams, Prod Area: Forth Estuary Anstruther, Site Name: Anstruther	Surf Clams, Prod Area: Forth Estuary Pittenweem, Site Name: Pittenweem	Common Mussels, Prod Area: E Loch Tarbenn, Site Name: Sound of Scalpy	Common Cockles, Prod Area: Northton Beach, Site Name: Northton	Mussels, Prod Area: South Uist 1, Site Name: Loch Skipport

Fat weight

ng/kg									
2,3,7,8-TCDD	0.53	6.55	0.93	0.48	0.73	0.79	0.46	0.48	0.8
1,2,3,7,8-PeCDD	2.2	13.52	3.7	1.19i	2.36i	2.25	1.38	2.02	4.56i
1,2,3,4,7,8-HxCDD	1.07	2.04	1.12	0.64	0.83	1.09i	1.17	1.15	0.9
1,2,3,6,7,8-HxCDD	1.65i	2.85	2.36	1.67	2.72i	2.09i	1.87	2.69	1.54
1,2,3,7,8,9-HxCDD	0.87i	1.78	1.69	0.89	1.22	1.55	1.43	2.16i	1.58
1,2,3,4,6,7,8-HpCDD	9.27	2.88	3.89	14.51	21.19	26.56	12.63	20	11.03
OCDD	32.43	10.13	14	50.38	86.91	112.16	79.01	89.47	51.16
2,3,7,8-TCDF	12.5	18.81	17.2	9.27	4.31	4.99	8.82	4.18	11.65
1,2,3,7,8-PeCDF	2.09	2.79	1.96	1.63	6.21	4.05	1.92	2.31	2.52
2,3,4,7,8-PeCDF	5.33	8.18	6.99	2.78	5.18	5.97	4.97	4.18	4.22
1,2,3,4,7,8-HxCDF	1.04	<0.33	0.19	1.04	1.27i	2.2i	0.84	2.4	0.72
1,2,3,6,7,8-HxCDF	0.86	0.15i	0.72	0.6	1.08	0.95	0.5	1.97	0.72i
1,2,3,7,8,9-HxCDF	0.15	<0.12	<0.05	0.15	0.36	0.27	<0.07	0.34	<0.12
2,3,4,6,7,8-HxCDF	1.7	0.5i	1.65	0.98	1.86	1.88	1.72	2.84	1.59
1,2,3,4,6,7,8-HpCDF	1.94	0.3	0.83	3.67	7.15	9	1.93	7.74	1.76
1,2,3,4,7,8,9-HpCDF	0.26	<0.18	0.12	0.15	0.41	0.43	0.27	0.91	0.24
OCDF	2.16	0.62	0.83	3.45	8.7	10.41	2.41	5.34	1.97
WHO-TEQ 2005 (ng/kg)									
lower	6.5	25.26	9.33	4.28	6.51	6.85	5.2	5.91	8.72
upper	6.5	25.3	9.34	4.28	6.51	6.85	5.2	5.91	8.73

i - indicative

FERA Sample No.	21176	21177	21178	21179	21183	21184	21185	21186	21187	21188	21200
FERA LIMS No.	S13-000945	S13-000946	S13-000947	S13-000948	S13-001060	S13-001061	S13-001062	S13-001063	S13-001064	S13-001118	S13-001138
Sample Details:	Common Cockles, Prod Area: Campbeltown Loch, Site Name: Kildalloig Bay	Razors, Prod Area; Pirnmill, Site Name: Pirnmill	Common Mussels, Prod Area: Vaila Sound, Site Name: Linga	Common Mussels, Prod Area: Gruting Voe, Site Name: Browland Voe	Fresh Mussels, Prod Area: Dornoch Firth, Site Name: Miekle Ferry	Mussels, Prod Area: Loch Eishort, Site Name: Drunfearn	Common Mussels, Prod Area: South of Houss Holm	Mussels, Prod Area: North Uist 2, Site Name: Lochmaddy	Common Mussels, Prod Area: Loch Melfort, Site Name: Loch Melfort	Common Mussels, Prod Area: Glenuig Bay, Site Name: Glenuig Bay	Common Mussels, Prod Area: Clift Sound Stream, Site Name: Stream Sound
Fat weight											
ng/kg											
2,3,7,8-TCDD	1.11	1.24	0.92	0.79	0.44	0.37	1.27	0.41	0.54	0.83	1.22
1,2,3,7,8-PeCDD	2.05i	1.9	3.1	1.94	1.36i	1.21i	3.69	2.04	2.39	3.48	3.56i
1,2,3,4,7,8-HxCDD	1.59	0.84	0.95	1.22	1.12	0.8	1.12	0.68i	0.99	1.25	1.47
1,2,3,6,7,8-HxCDD	4.04	2.48	1.91	2.0	1.42	1.43	2.35	1.38i	1.55	2.29	3.36
1,2,3,7,8,9-HxCDD	2.41	1.41	1.23i	1.31	0.68i	0.67i	1.23	2.0i	1.22i	1.75i	1.86i
1,2,3,4,6,7,8-HpCDD	28.18	15.69	8.61	8.58	11.48	7.88	13.18	8.94	8.18	15.63	13.77
OCDD	121.58	71.84	22.59	21.59	67.63	34.39	35.03	33.97	24.91	65.25	39.86
2,3,7,8-TCDF	19.49	43.59	15.33	12.98	5.43	6.5	20.39	7.39	12.99	15.82	38.76
1,2,3,7,8-PeCDF	6.44	2.57	3.29	3.09	2.12	1.34	4.06	1.7	2.14	2.92	5.24
2,3,4,7,8-PeCDF	9.89	13.27	7.78	6.41	3.24	3.21	8.95	3.52	5.15	7.38	15.38
1,2,3,4,7,8-HxCDF	4.36	2.8	0.86	1.28	0.92	0.62	1.49	0.79	0.7	2.67	1.47
1,2,3,6,7,8-HxCDF	3.22	1.69	1.11	1.18	0.88	0.5	1.52	0.58	0.61	1.04	1.66
1,2,3,7,8,9-HxCDF	<0.39	0.55	0.47	<0.26	0.37	0.2	<0.14	<0.11	0.22i	0.33	0.83
2,3,4,6,7,8-HxCDF	4.88	2.69	2.39	1.48	1.64	1.11	3.37	1.31	1.44	2.4	3.75
1,2,3,4,6,7,8-HpCDF	10.06	5.85	2.28	2.17	5.74	1.45	3.91	2.02	1.35	4.4	2.78
1,2,3,4,7,8,9-HpCDF	1.3	0.34	0.31	0.59	0.42	0.2	0.40	0.26	0.14	0.71	0.53
OCDF	8.92	5.85	2.81	2.83	6.69	1.78	4.31	1.96	2.19	7	4.53
WHO-TEQ 2005 (ng/kg)											
lower	10.75	13.05	9.0	7.02	4.28	3.87	11.10	5.09	6.62	9.6	15.05
upper	10.79	13.05	9.0	7.04	4.28	3.87	11.11	5.1	6.62	9.6	15.05

FERA Sample No.	21201	21205	21213	21235	21236	21237	21238	21239	21240	21241	21233
FERA LIMS No.	S13-001139	S13-003272	S13-003776	S13-004096	S13-004097	S13-004098	S13-004099	S13-004100	S13-004101	S13-004102	S13-003917
Sample Details:	Common Mussels, Prod Area: Clift Sound Whalwick, Site Name: Whalwick	Common Mussels, Prod Area: Gruting Voe, Site Name: Selivoe	Common Mussels, Prod Area: Basta Voe Cove, Site Name: Inner Site 2	Pacific Oysters, Prod Area: Kyle of Tongue, Site Name: Kyle of Tongue	Pacific Oysters, Prod Area: Loch Spelve, Croggan Pier, Site Name: Croggan Pier	Common Mussels, Prod Area: Loch Spelve, Inverlussa, Site Name: Site 1	Pacific Oysters, Prod Area: Loch Fyne, Ardkinglas, Site Name: The Point	Common Mussels, Prod Area: Loch Eil Fassfern, Site Name: Fassfern	Common Mussels, Prod Area: Vementry North, Site Name: Suthra Voe West	Common Mussels, Prod Area: Langsound, Site Name: Langsound	Common Mussels, Prod Area: Papa Little Voe, Site Name: Papa Little Voe
Fat weight											
ng/kg											
2,3,7,8-TCDD	0.98	0.91	0.65	1.40	2.08	1.37	1.90	0.89	0.71	1.5	0.68
1,2,3,7,8-PeCDD	2.8i	4.28	2.85	4.36	6.62	5.72	6.82	2.96	3.94i	4.28	2.32i
1,2,3,4,7,8-HxCDD	1.13	1.62	0.87	0.94	1.99	2.88	2.52	2.09	1.39	1.37	0.77
1,2,3,6,7,8-HxCDD	2.58	4.08	2.35	2.06	4.69	5.22i	5.84	4.29	2.73	3.51	1.98
1,2,3,7,8,9-HxCDD	1.23	1.78i	1.24i	1.46	3.30	3.44	3.05	1.78	0.59i	1.43i	1.18
1,2,3,4,6,7,8-HpCDD	12.06	10.53	7.67	3.57	5.98	31.85	10.78	16.85	13.99	18.66	8.13
OCDD	35.23	28.27	15.19	13.91	16.64	91.03	24.68	45.71	37.73	50.54	17.92
2,3,7,8-TCDF	30.45	16.47	17.38	26.67	33.43	31.19i	42.41	19.58	15.72	52.56	14.30
1,2,3,7,8-PeCDF	4.38	4.04	3.28	3.56	5.42	7.37	6.08	5.02	4	6.34	3.26
2,3,4,7,8-PeCDF	11.68	12.27	8.63	8.95	15.79	17.17	20.27	10.88	8.96	15.52	7.67
1,2,3,4,7,8-HxCDF	1.26	1.74	1.13	0.10	0.10	3.35	0.25	1.78	2.02	2.52	1.41
1,2,3,6,7,8-HxCDF	1.70	1.54	1.28	1.06	1.84	2.73	3.10	1.63	1.33	2.29	1.09
1,2,3,7,8,9-HxCDF	<0.25	<0.4	0.37	<0.04	0.10	0.72	0.29i	0.43	0.74	<0.21	<0.16
2,3,4,6,7,8-HxCDF	3.18	3.25	2.35	2.29	4.24	5.05	6.57	2.76	3.62	4.49	2.80
1,2,3,4,6,7,8-HpCDF	3.15	3.41	2.22	0.55	0.64	6.83	1.79	2.51	5.16	6.41	3.07
1,2,3,4,7,8,9-HpCDF	0.47	0.91	0.28	0.10	0.10	0.66	0.19	0.4	0.8	0.6	0.41
OCDF	4.28	3.60	1.89	0.47	0.62	7.89	1.71	3.35	4.12	5.12	2.48
WHO-TEQ 2005 (ng/kg)											
lower	11.74	12.20	8.99	12.06	18.64	18.34	21.52	10.91	10.48	17.72	7.87
upper	11.76	12.24	8.99	12.06	18.64	18.34	21.52	10.91	10.48	17.74	7.89

i - indicative

FERA Sample No.	21234	21242	21243	21248	21249	21251	21252	21253	21254	21255	21267
FERA LIMS No.	S13-003918	S13-004378	S13-004379	S13-004621	S13-004622	S13-004706	S13-004726	S13-004727	S13-004728	S13-004765	S13-005066
Sample Details:	Common Mussels, Prod Area: Loch Erisort, Site Name: Garbh Eilean	Common Cockles, Prod Area: Loch Na Cille, Site Name: Loch Na Cille Cockles	Common Mussels, Prod Area: East Firth, Site Name: Site 1	Pacific Oyster, Prod Area: Otter Ferry	Common Mussels, Prod Area: Weisdale, Site Name: Voe N Flotta	Razor; Production area: North Bay; Site name: Barassie	Common mussel; Prod area: loch Roag Miavaig; Site name: Miauaig	Common mussel; Prod area: loch Roag Barraglom; Site name: loch Barraglom	Common mussel; Prod area: loch Roag Torranish; Site name: loch Torranish	Dredged wedge clams, production area and site name: Stevenston sands	Pacific oyster, Loch Kishorn North oysters
Fat weight											
ng/kg											
2,3,7,8-TCDD	0.78	0.86	0.79	1.73	0.93	1.16	0.46	0.58	0.4	1.24	1.22
1,2,3,7,8-PeCDD	2.99	2.34	2.9i	5.45	3.78	2.19i	2.77i	2.61i	1.59i	2.04i	4.0i
1,2,3,4,7,8-HxCDD	2.42	1.19	1.25	1.52	1.42	0.66	1.93	2.12	1.26	2.74	1.17
1,2,3,6,7,8-HxCDD	3.09	2.87	2.38	4.46	3.04	1.87	2.58	3.21	2.17	6.08	1.76
1,2,3,7,8,9-HxCDD	1.91i	1.81i	1.37i	2.31	2.11	0.83	2.41	2.73	1.48	3.76	1.98
1,2,3,4,6,7,8-HpCDD	31.20	15.71	9.98	6.62	18.43	9.89	24.14	26.41	14.69	46.18	4.51
OCDD	167.05	64.91	23.62	13.15	44.44	34.48	118.47	128.44	63.85	150.61	21.25
2,3,7,8-TCDF	13.86	6.97	13.05	57.61	18.61	36.89	11.08	9.34	8.83	15.99	19.04
1,2,3,7,8-PeCDF	3.97	3.01	2.65	5.08	3.72	2.31	2.32	2.73	1.63	5.47	2.35
2,3,4,7,8-PeCDF	7.59	4.63	8.3	19.73	9.86	10.04	6.12	5.87	4.13	11.57	7.5
1,2,3,4,7,8-HxCDF	2.60	2.67	1.24	0.12	2.26	1.73	1.52	2.18	1.2	8.9	0.29
1,2,3,6,7,8-HxCDF	1.74	2.15	1.25	1.64	2.36	0.86	1.08	1.47	0.74	3.74	0.84
1,2,3,7,8,9-HxCDF	<0.27	0.38	0.35	0.17	0.28	0.25	0.15	0.18	0.24	0.65	<0.11
2,3,4,6,7,8-HxCDF	3.16	2.72	2.67	4.08	4.54	2.05	2.34	2.94	1.79	5.8	1.95
1,2,3,4,6,7,8-HpCDF	8.55	6.88	3.1	0.67	7.47	4.5	4.92	7.08	3.5	24.7	0.81
1,2,3,4,7,8,9-HpCDF	0.83	0.67	0.34	<0.03	1.26	0.51	0.6	0.56	0.37	0.85	0.22
OCDF	9.89	4.82	3.51	0.55	7.11	3.48	4.4	5.46	2.59	15.06	1.01
WHO-TEQ 2005 (ng/kg)											
lower	9.50	7.01	8.76	20.52	11.53	11.11	7.78	7.83	5.25	12.45	10.31
upper	9.53	7.01	8.76	20.52	11.53	11.11	7.78	7.83	5.25	12.45	10.32

i - indicative

FERA Sample No.	21268	21273	21274	21275	21341
FERA LIMS No.	S13-005067	S13-005206	S13-005207	S13-005208	S13-023932
Sample Details:	Pacific oyster, Loch Creran Upper oysters	Queen scallops, Loch Fyne, Stonefields, North Bay	Common mussel, Loch Leven Upper	Pacific oyster, Comarty Bay West	Razor Shells, Prod Area: Fersness Bay, Site Name: Fersness Razors

Fat weight

ng/kg					
2,3,7,8-TCDD	1.52	1.34	0.99	1.40	0.2
1,2,3,7,8-PeCDD	5.88i	5.49	3.72	2.76	0.36
1,2,3,4,7,8-HxCDD	1.55	1.99	2.33	0.94	0.3
1,2,3,6,7,8-HxCDD	3.42	6.5	4.67	2.14	0.46
1,2,3,7,8,9-HxCDD	3.07	3.5	2.59	1.32	0.42
1,2,3,4,6,7,8-HpCDD	5.23	39.24	20.67	4.56	4.71
OCDD	12.34	176.79	70.16	15.04	16.33
2,3,7,8-TCDF	25.79	42.42	15.02	25.28	4.13
1,2,3,7,8-PeCDF	3.95	9.62	21.65	3.82	0.6
2,3,4,7,8-PeCDF	11.46	11.95	11.56	9.52	1.36
1,2,3,4,7,8-HxCDF	0.09	1.71	2.89	0.15	0.6
1,2,3,6,7,8-HxCDF	1.45	1.21	1.91	1.06	0.48
1,2,3,7,8,9-HxCDF	0.12	0.18	0.28	<0.07	0.1
2,3,4,6,7,8-HxCDF	3.28	4.25	4.07	2.21	0.72
1,2,3,4,6,7,8-HpCDF	0.82	9.11	4.00	1.25	2.29
1,2,3,4,7,8,9-HpCDF	0.16	0.57	0.51	0.14	0.16
OCDF	0.84	10.04	5.05	1.18	1.38
WHO-TEQ 2005 (ng/kg) lower	14.90	17.42	12.48	10.50	1.78
WHO-TEQ 2005 (ng/kg) upper	14.90	17.42	12.48	10.51	1.78

i - indicative

Table 3.2 Non-ortho PCB concentrations

FERA Sample No. FERA LIMS No.	21157	21158	21159	21160	21161	21162	21163	21164	21165
Sample Details:	S13-000817 Mussels, Production Area: Fleet Bay, Site Name: Fleet Bay	S13-000818 Common Mussels, Production Area: Busta Voe Lee South, Site Name: Greentaing,	S13-000819 Common Mussels, Production Area: Ronas Voe Mussels 2, Site Name: West of Blackwell	S13-000820 Common Mussels, Production Area: Dales Voe: Scarvar Ayre, Site Name: Scarvar Ayre,	S13-000855 Cockles, Prod Area: Traigh Cille Bhana, Site Name: Traigh Cille Bhana Cockles	S13-000856 Pacific Oysters, Prod Area: Loch Na Keal, Site Name: Eilean Liath	S13-000857 Common Mussels, Production Name: South Uyea, Site Name: South	S13-000858 Pacific Oysters, Prod Area: Baltasound Oysters, Site Name: Baltasound	S13-000859 Common Mussels, Prod Area: Loch Ailort, Site Name: Eilean Dubh
Whole Weight									
ng/kg									
PCB77	2.76	0.97i	0.57	1.33	0.19	1.11	0.67i	2.92	1.04
PCB81	0.15	0.07	0.04	0.08	0.01	0.08	0.04	0.18	0.07
PCB126	0.53	0.28	0.18	0.39	0.03	0.25	0.15	0.62	0.24
PCB169	0.16	0.07	0.05	0.10	0.02	0.06	0.05	0.12	0.08
WHO-TEQ 2005 (ng/kg) lower	0.06	0.03	0.02	0.04	<0.01	0.03	0.02	0.07	0.03
WHO-TEQ 2005 (ng/kg) upper	0.06	0.03	0.02	0.04	<0.01	0.03	0.02	0.07	0.03
Fat Weight									
ng/kg									
PCB77	287.51	97.7i	78.09	140.70	80.20	134.27	60.2i	256.71	187.33
PCB81	16.10	6.62	5.15	8.48	4.18	9.24	3.54	16.10	12.66
PCB126	55.21	28.08	25.14	41.55	13.99	29.92	13.82	54.71	43.73
PCB169	16.69	7.51	6.52	10.98	7.37	7.89	4.18	10.82	14.26
WHO-TEQ 2005 (ng/kg) lower	6.06	3.05	2.72	4.50	1.63	3.24	1.51	5.83	4.82
WHO-TEQ 2005 (ng/kg) upper	6.06	3.05	2.72	4.50	1.63	3.24	1.51	5.83	4.82

i - indicative

FERA Sample No. FERA LIMS No.	21166	21167	21168	21169	21170	21171	21172	21173	21175
Sample Details:	S13-000860 Common Mussels, Prod Area: Loch Ailort 1, Site Name: Site 1	S13-000861 Native Oysters, Prod Area: Loch Ailort 2, Site Name: Ephesus Bay	S13-000862 Pacific Oysters, Prod Area: Loch A Chumhainn, Site Name: Inner Deep Site	S13-000863 Razors, Prod Area: Forth Estuary Largo Bay, Site Name: LargoBay	S13-000864 Surf Clams, Prod Area: Forth Estuary Anstruther, Site Name: Anstruther	S13-000865 Surf Clams, Prod Area: Forth Estuary Pittenweem, Site Name: Pittenweem	S13-000942 Commom Mussels, Prod Area: E Loch Tarbenn, Site Name: Sound of Scalpy	S13- 000943 Common Cockles, Prod Area: Northton Beach, Site Name: Northton	S13- 000944 Mussels, Prod Area: South Uist 1, Site Name: Loch Skipport

Whole Weight

ng/kg									
PCB77	0.97	0.88	0.47i	5.26	3.77	2.92	0.80	0.11i	0.80
PCB81	0.06	0.12	0.03	0.51	0.35	0.26	0.05	<0.01	0.05
PCB126	0.24	0.20	0.13	0.48	0.48	0.38	0.21	0.02	0.18
PCB169	0.08	0.08	0.04	0.11	0.11	0.10	0.08	0.02	0.05
WHO-TEQ 2005 (ng/kg) lower	0.03	0.02	0.01	0.05	0.05	0.04	0.02	<0.01	0.02
WHO-TEQ 2005 (ng/kg) upper	0.03	0.02	0.01	0.05	0.05	0.04	0.02	<0.01	0.02

Fat Weight

ng/kg									
PCB77	117.54	178.98	139i	381.39	469.51	458.60	93.91	73.6i	217.43
PCB81	7.75	24.41	8.75	37.28	43.87	41.38	6.04	5.00	12.74
PCB126	28.89	41.44	37.16	35.10	59.93	59.14	24.90	15.24	49.24
PCB169	9.27	16.33	13.36	7.83	14.09	15.11	9.45	10.48	14.47
WHO-TEQ 2005 (ng/kg) lower	3.18	4.66	4.13	3.79	6.48	6.43	2.78	1.85	5.38
WHO-TEQ 2005 (ng/kg) upper	3.18	4.66	4.13	3.79	6.48	6.43	2.78	1.85	5.38

i - indicative

FERA Sample No.	21176	21177	21178	21179	21183	21184	21185	21186	21187	21188	21200
FERA LIMS No.	S13-000945	S13-000946	S13-000947	S13-000948	S13-001060	S13-001061	S13-001062	S13-001063	S13-001064	S13-001118	S13-001138
Sample Details:	Common Cockles, Prod Area: Campbeltown Loch, Site Name: Kildalloig Bay	Razors, Prod Area; Pirnmill, Site Name: Pirnmill	Common Mussels, Prod Area: Vaila Sound Linga, Site Name: Linga	Common Mussels, Prod Area: Gruting Voe Browland Voe, Site name: Browland Voe	Fresh Mussels, Prod Area: Dornoch Firth, Site Name: Miekle Ferry	Mussels, Prod Area: Loch Eishort, Site Name: Drunfean	Common Mussels, Prod Area: South of Houss Holm	Prod Area: North Uist 2, Site Name: Lochmaddy	Common Mussels, Prod Area: Loch Melfort, Site: Loch Melfort	Common Mussels, Prod Area: Glenuig Bay, Site Name: Glenuig Bay	Common Mussels, Prod Area: Clift Sound Stream Sound, Site Name: Stream Sound
Whole Weight											
ng/kg											
PCB77	1.59	7.78	0.77	0.38	0.33	0.44	0.51	0.49	1.27	0.74	1.92
PCB81	0.07	0.34	0.05	0.03	0.02	0.03	0.04	0.03	0.08	0.05	0.10
PCB126	0.15	0.46	0.25	0.13	0.07	0.09	0.18	0.14	0.25	0.17	0.65
PCB169	0.04	0.07	0.07	0.04	0.02	0.03	0.04	0.05	0.09	0.07	0.06
WHO-TEQ 2005 (ng/kg) lower	0.02	0.05	0.03	0.01	0.01	0.01	0.02	0.02	0.03	0.02	0.07
WHO-TEQ 2005 (ng/kg) upper	0.02	0.05	0.03	0.01	0.01	0.01	0.02	0.02	0.03	0.02	0.07
Fat Weight											
ng/kg											
PCB77	732.37	1195.21	155.18	132.46	100.55	103.65	156.84	102.76	169.78	172.40	663.68
PCB81	31.83	51.74	10.06	11.57	6.86	7.98	11.66	6.46	10.39	10.76	33.03
PCB126	69.19	71.19	50.64	45.49	21.00	20.81	54.30	28.46	33.97	40.78	225.82
PCB169	20.73	10.95	13.48	12.56	6.03	7.78	13.47	9.47	11.42	15.34	21.17
WHO-TEQ 2005 (ng/kg) lower	7.62	7.58	5.49	4.94	2.29	2.33	5.85	3.14	3.76	4.56	23.29
WHO-TEQ 2005 (ng/kg) upper	7.62	7.58	5.49	4.94	2.29	2.33	5.85	3.14	3.76	4.56	23.29

i - indicative

FERA Sample No.	21201	21205	21213	21235	21236	21237	21238	21239	21240	21241	21233
FERA LIMS No.	S13-001139	S13-003272	S13-003776	S13-004096	S13-004097	S13-004098	S13-004099	S13-004100	S13-004101	S13-004102	S13-003917
Sample Details:	Common Mussels, Clift Sound Whalwick, Site Name: Whalwick	Common Mussels, Prod Area: Voe, Site Name: Selivoe	Common Mussels, Prod Area: Basta Voe Cove, Site Name: Inner Site 2	Pacific Oysters, Prod Area: Kyle of Tongue, Site Name: Kyle of Tongue	Pacific Oysters, Prod Area: Loch Spelve, Site Name: Croggan Pier, Site Name: Croggan Pier	Common Mussels, Prod Area: Loch Spelve, Site Name: Inverlussa, Site Name: Site 1	Pacific Oysters, Prod Area: Loch Fyne, Site Name: Ardkinglas, Site Name: The Point	Common Mussels, Prod Area: Loch Eil Fassfern, Site Name: Fassfern	Common Mussels, Prod Area: Vementry North, Site Name: Suthra Voe West	Common Mussels, Prod Area: Langsound, Site Name: Langsound	Common Mussels, Prod Area: Little Voe, Site Name: Papa Little Voe

Whole Weight

ng/kg	21201	21205	21213	21235	21236	21237	21238	21239	21240	21241	21233
PCB77	2.28	0.54	0.63	1.36	3.28	2.39	3.14	3.28	0.27	6.8	0.89
PCB81	0.11	0.05	0.04	0.08	0.21	0.15	0.18	0.21	0.02	0.28	0.07
PCB126	0.83	0.23	0.19	0.40	0.71	0.51	0.34	0.51	0.1	1.8	0.26
PCB169	0.09	0.07	0.06	0.09	0.19	0.18	0.07	0.15	0.03	0.14	0.07
WHO-TEQ 2005 (ng/kg) lower	0.09	0.03	0.02	0.04	0.08	0.06	0.04	0.06	0.01	0.18	0.03
WHO-TEQ 2005 (ng/kg) upper	0.09	0.03	0.02	0.04	0.08	0.06	0.04	0.06	0.01	0.18	0.03

Fat Weight

ng/kg	21201	21205	21213	21235	21236	21237	21238	21239	21240	21241	21233
PCB77	525.88	166.02	148.86	218.44	334.51	341.78	663.38	313.43	95.25	1173.09	122.74
PCB81	26.29	14.37	9.82	13.48	21.86	21.62	37.71	20.18	7.43	48.3	9.02
PCB126	190.28	70.24	46.10	64.06	72.07	72.44	71.43	48.88	37.41	310.39	36.29
PCB169	19.87	20.47	13.27	14.61	19.34	25.74	15.50	14.76	11.11	24.95	10.31
WHO-TEQ 2005 (ng/kg) lower	19.68	7.66	5.03	6.87	7.83	8.06	7.69	5.37	4.09	31.92	3.95
WHO-TEQ 2005 (ng/kg) upper	19.68	7.66	5.03	6.87	7.83	8.06	7.69	5.37	4.09	31.92	3.95

i - indicative

FERA Sample No.	21234	21242	21243	21248	21249	21251	21252	21253	21254	21255	21267
FERA LIMS No.	S13-003918	S13-004378	S13-004379	S13-004621	S13-004622	S13-004706	S13-004726	S13-004727	S13-004728	S13-004765	S13-005066
Sample Details:	Common Mussels, Prod Area: Loch Erisort, Site Name: Loch Garbh Eilean	Common Cockles, Prod Area: Loch Na Cille, Site Name: Loch Na Cille Cockles	Common Mussels, Prod Area: East Firth, Site Name: Site 1	Pacific Oyster Otter Ferry	Common Mussels Weisdale Voe N Flotta	Production area: North Bay; Site name: Barassie	Common mussel; Prod area: loch Roag Miavaig; Site name: Miauaig	Common mussel; Prod area: loch Roag Barraglom; Site name: loch Barraglom	Common mussel; Prod area: loch Roag Torranish; Site name: loch Torranish	Dredged wedge clams, production area and site name: Stevenston sands	Pacific oyster, Loch Kishorn North oysters
Whole Weight											
ng/kg											
PCB77	0.79	0.45i	0.66	9.75i	0.83i	9.29	0.70	0.79	1.01	2.90	0.99
PCB81	0.06	0.03	0.04	0.49	0.06	0.49	0.05	0.05	0.07	0.20	0.08
PCB126	0.22	0.10	0.24	1.01	0.30	0.67	0.22	0.29	0.30	0.22	0.26
PCB169	0.08	0.05	0.06	0.17	0.08	0.10	0.08	0.10	0.10	0.04	0.07
WHO-TEQ 2005 (ng/kg) lower	0.02	0.01	0.03	0.11	0.03	0.07	0.02	0.03	0.03	0.02	0.03
WHO-TEQ 2005 (ng/kg) upper	0.02	0.01	0.03	0.11	0.03	0.07	0.02	0.03	0.03	0.02	0.03
Fat Weight											
ng/kg											
PCB77	172.29	215i	125.29	1017i	153.85i	1042.25	114.53	103.13	85.95	475.23	176.25
PCB81	12.66	13.33	8.49	50.88	11.27	55.02	7.35	7.04	5.59	32.18	13.62
PCB126	48.02	47.43	45.43	105.78	55.50	74.73	35.63	37.30	25.85	36.62	46.72
PCB169	16.97	24.69	10.78	17.51	15.16	11.53	12.55	13.34	8.91	6.29	11.90
WHO-TEQ 2005 (ng/kg) lower	5.33	5.51	4.88	11.22	6.02	7.94	3.95	4.14	2.86	3.91	5.05
WHO-TEQ 2005 (ng/kg) upper	5.33	5.51	4.88	11.22	6.02	7.94	3.95	4.14	2.86	3.91	5.05

i - indicative

FERA Sample No.	21268	21273	21274	21275	21341
FERA LIMS No.	S13-005067	S13-005206	S13-005207	S13-005208	S13-023932
Sample Details:	Pacific oyster, Loch Creran Upper oysters	Queen scallops, Loch Fyne, Stonefields, North Bay	Common mussel, Loch Leven Upper	Pacific oyster, Comarty Bay West	Razor Shells, Prod Area: Fersness Bay, Site Name: Fersness Razors

Whole Weight

ng/kg					
PCB77	1.60	7.22i	0.84	4.69	0.44i
PCB81	0.12	0.32	0.06	0.31	0.03
PCB126	0.35	0.48	0.23	0.61	0.09
PCB169	0.09	0.02	0.09	0.09	0.02
WHO-TEQ 2005 (ng/kg) lower	0.04	0.05	0.03	0.06	0.01
WHO-TEQ 2005 (ng/kg) upper	0.04	0.05	0.03	0.06	0.01

Fat Weight

ng/kg					
PCB77	235.80	728i	145.66	779.11	42.75i
PCB81	18.16	31.81	10.18	50.95	2.89
PCB126	51.74	48.71	40.46	101.15	8.53
PCB169	12.98	1.81	15.13	15.70	2.03
WHO-TEQ 2005 (ng/kg) lower	5.59	5.01	4.52	10.68	0.92
WHO-TEQ 2005 (ng/kg) upper	5.59	5.01	4.52	10.68	0.92

i - indicative

Table 3.3 *Ortho* PCB concentrations (Whole weight)

Fera Sample No. FERA LIMS No.	21157	21158	21159	21160	21161	21162	21163	21164
Sample Details:	S13-000817 Mussels, Production Area: Fleet Bay, Site Name: Fleet Bay	S13-000818 Common Mussels, Production Area: Busta Voe Lee South, Site Name: Greentaing,	S13-000819 Common Mussels, Production Area: Ronas Voe Mussels 2, Site Name: West of Blackwell	S13-000820 Common Mussels, Production Area: Dales Voe: Scarvar Ayre, Site Name: Scarvar Ayre,	S13-000855 Cockles, Prod Area: Traigh Cille Bhana, Site Name: Traigh Cille Bhana Cockles	S13-000856 Pacific Oysters, Prod Area: Loch Na Keal, Site Name: Eilean Liath	S13-000857 Common Mussels, Production Name: South Uyea, Site Name: South	S13-000858 Pacific Oysters, Prod Area: Baltasound Oysters, Site Name: Baltasound
µg/kg Whole Weight								
PCB18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB28	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
PCB31	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB47	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB49	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
PCB51	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB52	0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	0.02
PCB99	0.02	0.01	<0.01	0.02	<0.01	0.01	0.01	0.04
PCB101	0.04	0.03	0.01	0.04	<0.01	0.02	0.02	0.05
PCB105	0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	0.01
PCB114	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB118	0.04	0.02	0.01	0.03	<0.01	0.02	0.02	0.05
PCB123	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB128	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB138	0.12	0.06	0.03	0.07	<0.01	0.04	0.03	0.09
PCB153	0.14	0.07	0.05	0.09	<0.01	0.07	0.05	0.20
PCB156	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB157	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB167	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB180	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01
PCB189	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SUM of ICES 6(ug/kg) lower	0.31	0.16	0.09	0.21	<0.01	0.15	0.10	0.37
SUM of ICES 6(ug/kg) upper	0.33	0.19	0.12	0.23	0.06	0.17	0.13	0.38
WHO-TEQ 2005 (ng/kg) lower	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
WHO-TEQ 2005 (ng/kg) upper	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

FERA Sample No.	21165	21166	21167	21168	21169	21170	21171	21172
FERA LIMS No.	S13-000859	S13-000860	S13-000861	S13-000862	S13-000863	S13-000864	S13-000865	S13-000942
Sample Details:	Common Mussels, Prod Area: Loch Ailort, Site Name: Eilean Dubh	Common Mussels, Prod Area: Loch Ailort 1, Site Name: Site 1	Native Oysters, Prod Area: Loch Ailort 2, Site Name: Ephesus Bay	Pacific Oysters, Prod Area: Loch A Chumhainn, Site Name: Inner Deep Site	Razors, Prod Area: Forth Estuary Largo Bay, Site Name: LargoBay	Surf Clams, Prod Area: Forth Estuary Anstruther, Site Name: Anstruther	Surf Clams, Prod Area: Forth Estuary Pittenweem, Site Name: Pittenweem	Common Mussels, Prod Area: E Loch Tarbenn, Site Name: Sound of Scalpy
µg/kg Whole Weight								
PCB18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB28	<0.01	<0.01	<0.01	<0.01	0.03	0.01	<0.01	<0.01
PCB31	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01
PCB47	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01
PCB49	<0.01	<0.01	<0.01	<0.01	0.02	0.01	<0.01	<0.01
PCB51	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB52	<0.01	<0.01	<0.01	<0.01	0.04	0.02	0.01	<0.01
PCB99	0.01	0.01	<0.01	<0.01	0.04	0.03	0.03	<0.01
PCB101	0.02	0.02	0.01	<0.01	0.09	0.07	0.06	0.02
PCB105	<0.01	<0.01	<0.01	<0.01	0.02	0.01	0.01	<0.01
PCB114	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB118	0.02	0.01	0.01	<0.01	0.05	0.05	0.04	0.01
PCB123	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB128	<0.01	<0.01	<0.01	<0.01	0.02	0.02	0.02	<0.01
PCB138	0.04	0.04	0.04	0.02	0.13	0.17	0.14	0.04
PCB153	0.06	0.06	0.05	0.04	0.16	0.18	0.15	0.05
PCB156	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB157	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB167	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB180	<0.01	<0.01	<0.01	<0.01	<0.01	0.06	0.05	<0.01
PCB189	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SUM of ICES 6(ug/kg) lower	0.12	0.12	0.10	0.06	0.45	0.51	0.41	0.11
SUM of ICES 6(ug/kg) upper	0.15	0.15	0.13	0.10	0.46	0.51	0.42	0.14
WHO-TEQ 2005 (ng/kg) lower	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
WHO-TEQ 2005 (ng/kg) upper	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

FERA Sample No.	21173	21175	21176	21177	21178	21179	21183	21184
FERA LIMS No.	S13-000943	S13-000944	S13-000945	S13-000946	S13-000947	S13-000948	S13-001060	S13-001061
Sample Details:	Common Cockles, Prod Area: Northton Beach, Site Name: Northton	Mussels, Prod Area: South Uist 1, Site Name: Loch Skipport	Common Cockles, Prod Area: Campbeltown Loch, Site Name: Kildalloig Bay	Razors, Prod Area; Pirnmill, Site Name: Pirnmill	Common Mussels, Prod Area: Vaila Sound Linga, Site Name: Linga	Common Mussels, Prod Area: Gruting Voe Browland Voe, Site name: Browland Voe	Fresh Mussels, Prod Area: Dornoch Firth, Site Name: Miekle Ferry	Mussels, Prod Area: Loch Eishort, Site Name: Drumfean
µg/kg Whole Weight								
PCB18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB28	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01
PCB31	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01
PCB47	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01
PCB49	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	<0.01	<0.01
PCB51	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB52	<0.01	<0.01	<0.01	0.04	<0.01	<0.01	<0.01	<0.01
PCB99	<0.01	<0.01	<0.01	0.05	0.01	<0.01	<0.01	<0.01
PCB101	<0.01	<0.01	0.01	0.08	0.02	<0.01	<0.01	<0.01
PCB105	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	<0.01	<0.01
PCB114	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB118	<0.01	<0.01	0.01	0.06	0.02	<0.01	<0.01	<0.01
PCB123	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB128	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01
PCB138	<0.01	0.02	0.04	0.16	0.04	0.02	0.01	0.02
PCB153	<0.01	0.03	0.04	0.16	0.07	0.03	0.02	0.03
PCB156	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB157	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB167	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB180	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB189	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SUM of ICES 6(ug/kg) lower	<0.01	0.05	0.10	0.46	0.13	0.05	0.03	0.05
SUM of ICES 6(ug/kg) upper	0.06	0.09	0.12	0.47	0.16	0.09	0.07	0.09
WHO-TEQ 2005 (ng/kg) lower	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
WHO-TEQ 2005 (ng/kg) upper	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

FERA Sample No.	21185	21186	21187	21188	21200	21201	21205	21213
FERA LIMS No.	S13-001062	S13-001063	S13-001064	S13-001118	S13-001138	S13-001139	S13-003272	S13-003776
Sample Details:	Common Mussels, Prod Area: South of Houss Holm	Mussels, Prod Area: North Uist 2, Site Name: Lochmaddy	Common Mussels, Prod Area: Loch Melfort, Site: Loch Melfort	Common Mussels, Prod Area: Glenuig Bay, Site Name: Glenuig Bay	Common Mussels, Prod Area: Clift Sound Stream Sound, Site Name: Stream Sound	Common Mussels, Prod Area: Clift Sound Whalwick, Site Name: Whalwick	Common Mussels, Prod Area: Gruting Voe, Site Name: Selivoie	Common Mussels, Prod Area: Basta Voe Cove, Site Name: Inner Site 2
µg/kg Whole Weight								
PCB18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB28	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB31	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB47	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB49	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01
PCB51	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB52	<0.01	<0.01	<0.01	<0.01	0.02	0.03	<0.01	<0.01
PCB99	<0.01	<0.01	0.01	<0.01	0.06	0.07	<0.01	0.01
PCB101	0.01i	<0.01	0.02	0.01	0.15	0.17	0.02	0.02
PCB105	<0.01	<0.01	<0.01	<0.01	0.03	0.03	<0.01	<0.01
PCB114	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB118	0.01	<0.01	0.02	0.01	0.13	0.14	0.01	0.01
PCB123	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB128	<0.01	<0.01	<0.01	<0.01	0.03	0.04	<0.01	<0.01
PCB138	0.03	0.02	0.06	0.04	0.22	0.26	0.04	0.04
PCB153	0.04	0.02	0.08	0.05	0.22	0.28	0.06	0.06
PCB156	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01
PCB157	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB167	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01
PCB180	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB189	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SUM of ICES 6(ug/kg) lower	0.08	0.04	0.16	0.10	0.61	0.74	0.12	0.12
SUM of ICES 6(ug/kg) upper	0.11	0.08	0.19	0.13	0.63	0.76	0.15	0.15
WHO-TEQ 2005 (ng/kg) lower	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01
WHO-TEQ 2005 (ng/kg) upper	<0.01	<0.01	<0.01	<0.01	0.01	0.01	<0.01	<0.01

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FERA Sample No.	21235	21236	21237	21238	21239	21240	21241	21233
FERA LIMS No.	S13-004096	S13-004097	S13-004098	S13-004099	S13-004100	S13-004101	S13-004102	S13-003917
Sample Details:	Pacific Oysters, Prod Area: Kyle of Tongue, Site Name: Kyle of Tongue	Pacific Oysters, Prod Area: Loch Spelve: Croggan Pier, Site Name: Croggan Pier	Common Mussels, Prod Area: Loch Spelve: Inverlussa, Site Name: Site 1	Pacific Oysters, Prod Area: Loch Fyne: Ardkinglas, Site Name: The Point	Common Mussels, Prod Area: Loch Eil Fassfern, Site Name: Fassfern	Common Mussels, Prod Area: Vementry North, Site Name: Suthra Voe West	Common Mussels, Prod Area: Langsound, Site Name: Langsound	Common Mussels, Prod Area: Papa Little Voe, Site Name: Papa Little Voe
µg/kg Whole Weight								
PCB18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB28	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.01	<0.01
PCB31	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB47	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	0.01	<0.01
PCB49	<0.01	<0.01	<0.01	0.01	0.01	<0.01	0.02	<0.01
PCB51	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB52	0.01	0.01	0.01	0.02	0.03	<0.01	0.06	<0.01
PCB99	0.02	0.03	0.02	0.03	0.04	<0.01	0.14	0.01
PCB101	0.05	0.05	0.04	0.05	0.08	<0.01	0.33	0.02
PCB105	0.01	0.01	0.01	0.01	0.02	<0.01	0.07	<0.01
PCB114	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB118	0.04	0.04	0.03	0.04	0.05	<0.01	0.28	0.02
PCB123	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB128	<0.01	<0.01	0.01	<0.01	0.02	<0.01	0.07	<0.01
PCB138	0.08	0.10	0.10	0.08	0.12	0.02	0.45	0.04
PCB153	0.11	0.18	0.12	0.13	0.15	0.03	0.47	0.06
PCB156	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01
PCB157	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB167	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01
PCB180	<0.01	0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01
PCB189	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SUM of ICES 6(ug/kg) lower	0.25	0.35	0.28	0.28	0.40	0.05	1.33	0.12
SUM of ICES 6(ug/kg) upper	0.27	0.36	0.29	0.30	0.40	0.09	1.33	0.15
WHO-TEQ 2005 (ng/kg) lower	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01
WHO-TEQ 2005 (ng/kg) upper	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01

FERA Sample No.	21234	21242	21243	21248	21249	21251	21252	21253
FERA LIMS No.	S13-003918	S13-004378	S13-004379	S13-004621	S13-004622	S13-004706	S13-004726	S13-004727
Sample Details:	Common Mussels, Prod Area: Loch Erisort, Site Name: Garbh Eilean	Common Cockles, Prod Area: Loch Na Cille, Site Name: Loch Na Cille Cockles	Common Mussels, Prod Area: East Firth, Site Name: Site 1	Pacific Oyster Otter Ferry	Common Mussels Weisdale Voe N Flotta	Razor; Production area: North Bay; Site name: Barassie	Common mussel; Prod area: loch Roag Miavaig; Site name: Miauaig	Common mussel; Prod area: loch Roag Barraglom; Site name: loch Barraglom
µg/kg Whole Weight								
PCB18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB28	<0.01	<0.01	<0.01	0.03	<0.01	0.03	<0.01	<0.01
PCB31	<0.01	<0.01	<0.01	0.02	<0.01	0.02	<0.01	<0.01
PCB47	<0.01	<0.01	<0.01	0.03	<0.01	0.02	<0.01	<0.01
PCB49	<0.01	<0.01	<0.01	0.04	<0.01	0.04	<0.01	<0.01
PCB51	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB52	<0.01	<0.01	<0.01	0.06	<0.01	0.07	<0.01	<0.01
PCB99	<0.01	<0.01	0.01	0.10	0.01	0.10	0.01	0.01
PCB101	0.02	<0.01	0.03	0.16	0.02	0.20	0.02	0.02
PCB105	<0.01	<0.01	<0.01	0.04	<0.01	0.05	<0.01	<0.01
PCB114	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB118	0.01	<0.01	0.02	0.13	0.02	0.14	0.01	0.02
PCB123	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB128	<0.01	<0.01	<0.01	0.02	<0.01	0.04	<0.01	<0.01
PCB138	0.05	0.01	0.05	0.28	0.05	0.29	0.04	0.05
PCB153	0.06	0.01	0.07	0.51	0.07	0.34	0.06	0.08
PCB156	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB157	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB167	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
PCB180	<0.01	<0.01	<0.01	0.04	<0.01	<0.01	<0.01	<0.01
PCB189	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SUM of ICES 6(ug/kg) lower	0.13	0.02	0.15	1.08	0.14	0.93	0.12	0.15
SUM of ICES 6(ug/kg) upper	0.16	0.06	0.18	1.08	0.17	0.94	0.15	0.18
WHO-TEQ 2005 (ng/kg) lower	<0.01	<0.01	<0.01	0.01	<0.01	0.01	<0.01	<0.01
WHO-TEQ 2005 (ng/kg) upper	<0.01	<0.01	<0.01	0.01	<0.01	0.01	<0.01	<0.01

FERA Sample No.	21254	21255	21267	21268	21273	21274	21275	21341
FERA LIMS No.	S13-004728	S13-004765	S13-005066	S13-005067	S13-005206	S13-005207	S13-005208	S13-023932
Sample Details:	Common mussel; Prod area: loch Roag Torranish; Site name: loch Torranish	Dredged wedge clams, production area and site name: Stevenston sands	Pacific oyster, Loch Kishorn North oysters	Pacific oyster, Loch Creran Upper oysters	Queen scallops, Loch Fyne, Stonefields, North Bay	Common mussel, Loch Leven Upper	Pacific oyster, Comarty Bay West	Razor Shells, Prod Area: Fersness Bay, Site Name: Fersness Razors
µg/kg Whole Weight								
PCB18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB28	<0.01	0.01	<0.01	<0.01	0.02	<0.01	0.02	<0.01
PCB31	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01
PCB47	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	0.01	<0.01
PCB49	<0.01	0.01	<0.01	<0.01	0.03	<0.01	0.02	<0.01
PCB51	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB52	<0.01	0.02	<0.01	<0.01	0.04	<0.01	0.03	<0.01
PCB99	0.02	0.03	0.01	0.02	0.08	0.01	0.04	<0.01
PCB101	0.02	0.07	0.02	0.03	0.14	0.02	0.08	<0.01
PCB105	<0.01	0.02	<0.01	<0.01	0.04	<0.01	0.02	<0.01
PCB114	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB118	0.02	0.06	0.02	0.03	0.10	0.02	0.06	<0.01
PCB123	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB128	<0.01	0.02	<0.01	<0.01	0.04	<0.01	0.02	<0.01
PCB138	0.06	0.12	0.04	0.05	0.33	0.05	0.18	0.01
PCB153	0.09	0.14	0.07	0.09	0.41	0.07	0.26	0.02
PCB156	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB157	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB167	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB180	<0.01	0.01	<0.01	<0.01	0.15	<0.01	0.02	<0.01
PCB189	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SUM of ICES 6(ug/kg) lower	0.17	0.37	0.13	0.17	1.09	0.14	0.59	0.03
SUM of ICES 6(ug/kg) upper	0.20	0.37	0.16	0.20	1.09	0.17	0.59	0.07
WHO-TEQ 2005 (ng/kg) lower	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
WHO-TEQ 2005 (ng/kg) upper	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01

Table 3.3 *Ortho* PCB concentrations (Lipid weight)

FERA Sample No.	21157	21158	21159	21160	21161	21162	21163	21164
FERA LIMS No.	S13-000817	S13-000818	S13-000819	S13-000820	S13-000855	S13-000856	S13-000857	S13-000858
Sample Details:	Mussels, Production Area: Fleet Bay, Site Name: Fleet Bay	Common Mussels, Production Area: Busta Voe Lee South, Site Name: Greentaing,	Common Mussels, Production Area: Ronas Voe Mussels 2, Site Name: West of Blackwell	Common Mussels, Production Area: Dales Voe: Scarvar Ayre, Site Name: Scarvar Ayre,	Cockles, Prod Area: Traigh Cille Bhana, Site Name: Traigh Cille Bhana Cockles	Pacific Oysters, Prod Area: Loch Na Keal, Site Name: Eilean Liath	Common Mussels, Production Name: South Uyea, Site Name: South	Pacific Oysters, Prod Area: Baltasound Oysters, Site Name: Baltasound
µg/kg Fat weight								
PCB18	0.25	0.17	0.33	0.35	0.33	0.29	0.24	0.30
PCB28	0.73	0.52	0.74	0.72	0.59	0.71	0.57	1.00
PCB31	0.52	0.37	0.58	0.53	0.49i	0.48	0.44	0.61
PCB47	0.40	0.33	0.34	0.46	0.25	0.55	0.24	0.76
PCB49	0.62	0.47	0.39	0.66	0.22	0.60	0.35	0.99
PCB51	0.02	0.02	0.03	<0.03	0.06	0.13	<0.05	0.06
PCB52	1.08	0.93	0.77	1.42	0.41	0.91	0.73	1.53
PCB99	2.33	1.31	1.14	2.15	0.40	1.70	0.98	3.68
PCB101	4.48	3.17	1.95	3.97	0.58	2.04	1.49	4.77
PCB105	1.41	0.71	0.50	1.10	0.24i	0.75	0.49	1.14
PCB114	0.06	0.02	0.05	0.07	0.06	0.09	<0.04	0.05
PCB118	4.09	2.15	1.71	3.37	0.68	2.01	1.46	4.76
PCB123	0.07	0.03	0.03	0.05	<0.02	0.10	<0.02	0.09
PCB128	1.68	0.65	0.53	0.88	0.19	0.71	0.42	0.55
PCB138	12.80	5.60	4.43	7.16	1.41	5.31	3.12	8.17
PCB153	14.79	7.08	6.45	9.20	1.63	9.04	4.14	17.72
PCB156	0.50	0.22	0.16	0.30	0.10	0.42	0.17	0.17
PCB157	0.19i	0.09	0.06	0.12	<0.06	0.32	0.05	0.14i
PCB167	0.41	0.17	0.14	0.24	0.07	0.50	0.13	0.42
PCB180	0.78	0.48	0.39	0.59	0.37	2.70	0.48	0.86
PCB189	0.11	<0.03	<0.07	<0.05	<0.07	<0.1	<0.07	0.05
SUM of ICES 6(ug/kg) lower	34.66	17.78	14.73	23.06	4.99	20.71	10.53	34.05
SUM of ICES 6(ug/kg) upper	34.66	17.78	14.73	23.06	4.99	20.71	10.53	34.05
WHO-TEQ 2005 (ng/kg) lower	0.21	0.10	0.08	0.16	0.03	0.13	0.07	0.20
WHO-TEQ 2005 (ng/kg) upper	0.21	0.10	0.08	0.16	0.04	0.13	0.07	0.20
i - indicative								

FERA Sample No.	21165	21166	21167	21168	21169	21170	21171	21172
FERA LIMS No.	S13-000859	S13-000860	S13-000861	S13-000862	S13-000863	S13-000864	S13-000865	S13-000942
Sample Details:	Common Mussels, Prod Area: Loch Ailort, Site Name: Eilean Dubh	Common Mussels, Prod Area: Loch Ailort 1, Site Name: Site 1	Native Oysters, Prod Area: Loch Ailort 2, Site Name: Ephesus Bay	Pacific Oysters, Prod Area: Loch A Chumhainn, Site Name: Inner Deep Site	Razors, Prod Area: Forth Estuary Largo Bay, Site Name: LargoBay	Surf Clams, Prod Area: Forth Estuary Anstruther, Site Name: Anstruther	Surf Clams, Prod Area: Forth Estuary Pittenweem, Site Name: Pittenweem	Commom Mussels, Prod Area: E Loch Tarbenn, Site Name: Sound of Scalpy
µg/kg Fat weight								
PCB18	0.29	0.22	0.14	0.35	0.45	0.25	0.26	0.13
PCB28	0.69	0.51	0.67	0.77	1.93	1.43	1.38	0.40
PCB31	0.48	0.34	0.37	0.57	1.34	0.87	0.81	0.28
PCB47	0.52	0.34	0.50	0.49	1.03	0.98	0.98	0.25
PCB49	0.65	0.42	0.55	0.45	1.64	1.52	1.48	0.34
PCB51	0.03	0.03	0.05	0.08	0.10	0.07	0.09	0.02
PCB52	1.19	0.75	0.92	0.75	2.66	2.21	2.15	0.63
PCB99	1.95	1.24	1.94	1.28	2.82	3.90	4.03	1.05
PCB101	3.52	2.17	3.04	2.06	6.41	8.81	9.02	1.87
PCB105	0.88	0.59	0.79	0.53	1.39	1.84	1.93	0.42
PCB114	0.06	0.03	0.05i	0.10	0.08	0.08	0.11	0.03
PCB118	2.80	1.79	2.67	2.24	3.82	5.79	5.88	1.37
PCB123	0.03	0.03	0.04	0.10	0.10	0.12	0.16	0.04
PCB128	0.88	0.60	0.66	0.34	1.33	2.35	2.69	0.49
PCB138	7.54	4.85	7.25	5.11	9.50	20.75	22.43	4.61
PCB153	10.21	6.86	10.69	10.52	11.29	22.42	23.72	6.28
PCB156	0.29	0.19	0.15	0.18	0.28	0.44	0.53	0.16
PCB157	0.11	0.07	0.07	<0.04	0.17	0.45	0.49	0.07
PCB167	0.26	0.17	0.24	0.32	0.25	0.71	0.82	0.14
PCB180	0.58	0.42	0.30	0.69	0.28	6.86	7.50	0.46
PCB189	<0.09	<0.02	<0.04	<0.05	<0.04	0.09	0.05	<0.05
SUM of ICES 6(ug/kg) lower	23.73	15.56	22.87	19.90	32.07	62.48	66.20	14.25
SUM of ICES 6(ug/kg) upper	23.73	15.56	22.87	19.90	32.07	62.48	66.20	14.25
WHO-TEQ 2005 (ng/kg) lower	0.13	0.09	0.12	0.10	0.18	0.29	0.30	0.07
WHO-TEQ 2005 (ng/kg) upper	0.14	0.09	0.12	0.11	0.18	0.29	0.30	0.07

FERA Sample No.	21173	21175	21176	21177	21178	21179	21183	21184
FERA LIMS No.	S13-000943	S13-000944	S13-000945	S13-000946	S13-000947	S13-000948	S13-001060	S13-001061
Sample Details:	Common Cockles, Prod Area: Northton Beach, Site Name: Northton	Mussels, Prod Area: South Uist 1, Site Name: Loch Skipport	Common Cockles, Prod Area: Campbeltown Loch, Site Name: Kildalloig Bay	Razors, Prod Area; Pirnmill, Site Name: Pirnmill	Common Mussels, Prod Area: Vaila Sound Linga, Site Name: Linga	Common Mussels, Prod Area: Gruting Voe Browland Voe, Site name: Browland Voe	Fresh Mussels, Prod Area: Dornoch Firth, Site Name: Mickle Ferry	Mussels, Prod Area: Loch Eishort, Site Name: Drunfearn
µg/kg Fat weight								
PCB18	0.40	0.26	0.28	0.49	0.26	0.29	0.19	0.21
PCB28	0.77	0.69	1.14	3.33	0.67	0.63i	0.48	0.59
PCB31	0.57	0.63	0.59	2.33	0.52	0.56	0.44	0.48
PCB47	0.49	0.87	0.84	2.62	0.55	0.55	0.45	0.37
PCB49	0.39	0.74	1.14	3.91	0.58	0.51	0.49	0.45
PCB51	0.09	0.09	0.11	0.34	0.04	0.05	0.05	<0.03
PCB52	0.62	1.38	1.69	5.51	1.11	0.92	0.92	0.76
PCB99	0.45	1.52	3.66	6.99	2.16	1.77	1.01	1.08
PCB101	0.98	2.72	5.90	12.98	3.76	3.23	2.15	1.76
PCB105	0.24	0.78	2.47	4.18	0.93	0.78	0.60	0.38
PCB114	<0.03	0.05	0.12	0.15	0.07	0.06	0.12i	0.07
PCB118	0.69	2.40	6.25	9.96	3.24	2.56	1.60	1.30
PCB123	<0.02	0.04	0.09	0.39	0.05	0.05	0.07	0.03
PCB128	0.20	0.70	1.95	3.35	1.07	1.16	0.42	0.50
PCB138	1.49	6.36	16.32	24.45	8.76	8.65	3.27	4.16
PCB153	1.79	8.38	16.30	24.40	13.40	11.47	4.69	6.54
PCB156	<0.1	0.23	1.03	0.72	0.36	0.13	0.19	0.14
PCB157	<0.04	0.09	0.37	0.26	0.13	<0.09	0.12	0.06
PCB167	0.08	0.22	0.60	0.39	0.35	0.31	0.16	0.14
PCB180	0.50	0.38	5.49	1.06	0.70	0.36i	0.33	0.36
PCB189	<0.1	<0.04	<0.09	<0.04	0.1i	<0.08	<0.07	<0.05
SUM of ICES 6(ug/kg) lower	6.15	19.91	46.84	71.73	28.40	25.26	11.84	14.17
SUM of ICES 6(ug/kg) upper	6.15	19.91	46.84	71.73	28.40	25.26	11.84	14.17
WHO-TEQ 2005 (ng/kg) lower	0.03	0.11	0.33	0.48	0.16	0.12	0.09	0.06
WHO-TEQ 2005 (ng/kg) upper	0.04	0.12	0.33	0.48	0.16	0.12	0.09	0.07

FERA Sample No.	21185	21186	21187	21188	21200	21201	21205	21213
FERA LIMS No.	S13-001062	S13-001063	S13-001064	S13-001118	S13-001138	S13-001139	S13-003272	S13-003776
Sample Details:	Common Mussels, Prod Area: South of Houss Holm	Mussels, Prod Area: North Uist 2, Site Name: Lochmaddy	Common Mussels, Prod Area: Loch Melfort, Site: Loch Melfort	Common Mussels, Prod Area: Glenuig Bay, Site Name: Glenuig Bay	Common Mussels, Prod Area: Clift Sound Stream Sound, Site Name: Stream Sound	Common Mussels, Prod Area: Clift Sound Whalwick, Site Name: Whalwick	Common Mussels, Prod Area: Gruting Voe, Site Name: Selivoe	Common Mussels, Prod Area: Basta Voe Cove, Site Name: Inner Site 2
µg/kg Fat weight								
PCB18	0.30	0.13	0.14	0.18	0.30	0.38	0.38	0.28
PCB28	0.73	0.41	0.57	0.65	1.12	1.22	0.96	0.79
PCB31	0.58	0.31	0.39	0.53	0.82	0.83	0.67	0.57
PCB47	0.39	0.33	0.42	0.38	1.45	1.17	0.68	0.59
PCB49	0.50	0.34	0.54	0.50	2.86	2.33	0.79	0.74
PCB51	0.03	<0.04	<0.02	0.05	<0.08	0.07	0.06	<0.05
PCB52	0.95	0.62	1.02	1.18	7.91	5.83	1.59	1.36
PCB99	1.92	0.89	1.83	1.78	20.81	15.33	3.02	2.48
PCB101	4.17i	1.41	3.25	3.20	52.16	38.70	6.11	4.26
PCB105	1.00	0.48	0.78	0.80	10.28	8.04	1.16	1.07
PCB114	0.06	<0.02	0.03i	0.08	0.42	0.24	0.06	<0.05
PCB118	3.50	1.42	2.49	2.64	44.78	33.09	4.15	3.39
PCB123	0.05	<0.03	0.04	0.05	0.44	0.36	0.08	0.09
PCB128	1.03	0.48	0.93	0.97	11.65	8.73	1.33	1.13
PCB138	9.46	3.81	7.95	8.24	75.95	60.22	12.64	9.12
PCB153	13.74	4.86	10.71	10.71	76.95	64.66	19.20	13.35
PCB156	0.39	0.17	0.30	0.37	3.41	2.84	0.42	0.37
PCB157	0.11	0.07	0.15	0.15	1.28	1.05	0.20	0.21
PCB167	0.38	0.13	0.23	0.23	2.45	2.99	0.47	0.33
PCB180	0.71	0.26	0.63	0.86	1.49	1.82	0.91	0.84
PCB189	<0.11	<0.03	<0.04	<0.08	0.57i	0.58i	<0.17	0.02
SUM of ICES 6(ug/kg) lower	29.76	11.37	24.13	24.84	215.58	172.45	41.41	29.72
SUM of ICES 6(ug/kg) upper	29.76	11.37	24.13	24.84	215.58	172.45	41.41	29.72
WHO-TEQ 2005 (ng/kg) lower	0.16	0.07	0.12	0.13	1.91	1.48	0.20	0.16
WHO-TEQ 2005 (ng/kg) upper	0.17	0.07	0.12	0.13	1.91	1.48	0.20	0.17

i - indicative

FERA Sample No.	21235	21236	21237	21238	21239	21240	21241	21233
FERA LIMS No.	S13-004096	S13-004097	S13-004098	S13-004099	S13-004100	S13-004101	S13-004102	S13-003917
Sample Details:	Pacific Oysters, Prod Area: Kyle of Tongue, Site Name: Kyle of Tongue	Pacific Oysters, Prod Area: Loch Spelve: Croggan Pier, Site Name: Croggan Pier	Common Mussels, Prod Area: Loch Spelve: Inverlussa, Site Name: Site 1	Pacific Oysters, Prod Area: Loch Fyne: Ardkinglas, Site Name: The Point	Common Mussels, Prod Area: Loch Eil Fassfern, Site Name: Fassfern	Common Mussels, Prod Area: Vementry North, Site Name: Suthra Voe West	Common Mussels, Prod Area: Langsound, Site Name: Langsound	Common Mussels, Prod Area: Papa Little Voe, Site Name: Papa Little Voe
µg/kg Fat weight								
PCB18	0.25	0.23	0.32	0.35	0.30	0.25	0.34	0.20
PCB28	0.76	0.92	0.94	2.07	1.22	0.62	1.73	0.67
PCB31	0.57	0.60	0.69	1.31	0.83	0.54	0.89	0.43
PCB47	0.46	0.68	0.68	2.16	0.87	0.49	2.25	0.46
PCB49	0.80	0.90	0.98	2.87	1.41	0.53	4.29	0.53
PCB51	0.07	0.11	0.05	0.22	0.04	0.06	0.17	0.04
PCB52	2.14	1.45	1.69	4.58	2.41	0.98	10.35	1.05
PCB99	3.43	3.16	3.05	7.00	3.35	1.59	24.03	1.48
PCB101	7.76	5.44	5.77	11.60	7.23	2.45	56.61	3.17
PCB105	1.95	1.31	1.56	2.49	1.68	0.63	12.31	0.73
PCB114	0.04i	0.06	0.08	0.06i	0.08	<0.03	0.14i	0.03
PCB118	6.35	4.50	4.73	7.99	4.76	2.16	48.31	2.22
PCB123	0.11	0.08	0.08	0.27	0.06	0.07	0.41	0.03
PCB128	1.26	0.83	1.72	1.26	1.45	0.68	11.83	0.68
PCB138	12.55	10.51	14.12	17.23	11.07	6.67	78.21	5.94
PCB153	17.19	18.10	16.69	27.38	14.40	10.29	81.44	8.21
PCB156	0.52	0.24	0.56	0.39	0.55	0.18	3.86	0.24
PCB157	0.30	0.15	0.25	0.26i	0.21	0.13	1.50	0.09
PCB167	0.62	0.49	0.47	0.54	0.38	0.25	3.22	0.21
PCB180	1.23	1.10	1.47	1.92	1.31	0.45	2.40	0.51
PCB189	0.12	<0.03	0.18i	0.14i	0.09	<0.03	0.07	0.09
SUM of ICES 6(ug/kg) lower	41.63	37.52	40.68	64.78	37.64	21.46	230.74	19.55
SUM of ICES 6(ug/kg) upper	41.63	37.52	40.68	64.78	37.64	21.46	230.74	19.55
WHO-TEQ 2005 (ng/kg) lower	0.30	0.20	0.24	0.36	0.23	0.10	2.09	0.11
WHO-TEQ 2005 (ng/kg) upper	0.30	0.21	0.24	0.36	0.23	0.10	2.09	0.11

FERA Sample No.	21234	21242	21243	21248	21249	21251	21252	21253
FERA LIMS No.	S13-003918	S13-004378	S13-004379	S13-004621	S13-004622	S13-004706	S13-004726	S13-004727
Sample Details:	Common Mussels, Prod Area: Loch Erisort, Site Name: Garbh Eilean	Common Cockles, Prod Area: Loch Na Cille, Site Name: Loch Na Cille Cockles	Common Mussels, Prod Area: East Firth, Site Name: Site 1	Pacific Oyster Otter Ferry	Common Mussels Weisdale Voe N Flotta	Razor; Production area: North Bay; Site name: Barassie	Common mussel; Prod area: loch Roag Miavaig; Site name: Miauaig	Common mussel; Prod area: loch Roag Barraglom; Site name: loch Barraglom
µg/kg Fat weight								
PCB18	0.26	0.36	0.18	0.41	0.20	0.76	0.16	0.18
PCB28	0.68	0.91i	0.48	2.91	0.65	3.64	0.47	0.45
PCB31	0.49	0.62	0.36	1.94	0.48	2.75	0.33	0.36
PCB47	0.47	0.59	0.36	2.77	0.47	2.68	0.38	0.40
PCB49	0.62	0.61	0.52	3.94	0.58	4.68	0.47	0.48
PCB51	0.05	0.12	0.03	0.28	0.05	0.32	0.03	0.04
PCB52	1.10	0.99	1.04	5.78	1.09	7.73	0.86	0.87
PCB99	2.02	1.33	2.36	10.16	2.19	11.24	1.77	1.70
PCB101	3.80	2.23	5.13	17.14	4.32	22.85	2.68	2.90
PCB105	1.02	0.83i	1.05	3.74	1.21	6.09	0.71	0.74
PCB114	0.05	<0.03	0.07	0.21	0.06i	0.24	0.08	0.05
PCB118	3.24	2.17	4.16	13.14	4.11	16.15	2.36	2.59
PCB123	0.07	<0.04	0.08	0.38	0.05	0.28	0.04	0.06
PCB128	1.12	0.76	1.13	2.01	1.29	4.65	0.76	0.77
PCB138	9.87	5.58	9.54	28.72	10.02	32.48	6.53	6.90
PCB153	13.15	6.12	12.54	52.90	13.07	38.41	9.64	10.69
PCB156	0.41	0.40	0.33	0.61	0.43	1.02	0.26	0.28
PCB157	0.19	<0.04	0.15	0.38	0.19	0.34	0.13	0.15
PCB167	0.37	0.34	0.35	1.09	0.34	0.56	0.20	0.26
PCB180	0.81	1.84	0.42	4.36	0.79	0.57	0.57	0.93
PCB189	0.11	<0.1	<0.02	<0.06	0.15i	0.13i	<0.05	<0.02
SUM of ICES 6(ug/kg) lower	29.41	17.67	29.15	111.81	29.94	105.68	20.75	22.74
SUM of ICES 6(ug/kg) upper	29.41	17.67	29.15	111.81	29.94	105.68	20.75	22.74
WHO-TEQ 2005 (ng/kg) lower	0.16	0.11	0.19	0.59	0.20	0.74	0.11	0.12
WHO-TEQ 2005 (ng/kg) upper	0.16	0.12	0.19	0.59	0.20	0.74	0.11	0.12

FERA Sample No.	21254	21255	21267	21268	21273	21274	21275	21341
FERA LIMS No.	S13-004728	S13-004765	S13-005066	S13-005067	S13-005206	S13-005207	S13-005208	S13-023932
Sample Details:	Common mussel; Prod area: loch Roag Torranish; Site name: loch Torranish	Dredged wedge clams, production area and site name: Stevenston sands	Pacific oyster, Loch Kishorn North oysters	Pacific oyster, Loch Creran Upper oysters	Queen scallops, Loch Fyne, Stonefields, North Bay	Common mussel, Loch Leven Upper	Pacific oyster, Comarty Bay West	Razor Shells, Prod Area: Fersness Bay, Site Name: Fersness Razors
µg/kg Fat weight								
PCB18	0.15	0.50	0.17	0.18	0.30	0.24	0.48	0.13
PCB28	0.39	1.69	0.61	0.70	1.99	0.56	2.61	0.31
PCB31	0.32	0.94	0.50	0.50	1.33	0.41	1.63	0.23
PCB47	0.45	1.03	0.47	0.59	1.97	0.46	1.69	0.17
PCB49	0.38	1.67	0.62	0.80	2.95	0.65	2.81	0.21
PCB51	0.06	0.08	0.06	0.10	0.19	0.06	0.16	0.02
PCB52	0.69	3.07	1.09	1.40	4.48	1.12	4.24	0.38
PCB99	1.34	5.32	2.10	2.98	7.80	2.05	7.05	0.36
PCB101	2.12	11.63	3.32	5.17	14.53	3.97	14.11	0.74
PCB105	0.54	3.25	0.80	1.22	3.62	0.98	3.16	0.20
PCB114	0.05i	0.23	<0.03	0.09	0.16	<0.06	0.15	<0.01
PCB118	1.80	10.53	2.72	4.03	10.21	2.73	10.62	0.54
PCB123	0.03	0.25	0.06	0.10	0.21	0.08	0.31	<0.01
PCB128	0.56	2.46	0.53	0.75	3.82	1.02	2.82	0.19
PCB138	4.81	20.22	6.55	8.10	32.87	8.95	30.27	1.34
PCB153	7.35	22.95	12.67	13.58	41.69	11.42	43.19	1.46
PCB156	0.20	1.36	0.13	0.19	0.56	0.34	0.95	0.05
PCB157	0.10	0.32	0.14	0.16	0.49	0.05	0.59	0.03
PCB167	0.16	0.59	0.29	0.30	0.67	0.35	1.16	0.04
PCB180	0.50	1.68	0.57	0.79	15.08	1.17	3.74	0.09
PCB189	<0.04	0.18i	<0.02	<0.04	<0.03	<0.05	0.11i	<0.04
SUM of ICES 6(ug/kg) lower	15.86	61.24	24.81	29.74	110.64	27.19	98.16	4.32
SUM of ICES 6(ug/kg) upper	15.86	61.24	24.81	29.74	110.64	27.19	98.16	4.32
WHO-TEQ 2005 (ng/kg) lower	0.09	0.50	0.12	0.18	0.48	0.14	0.51	0.03
WHO-TEQ 2005 (ng/kg) upper	0.09	0.50	0.13	0.18	0.48	0.14	0.51	0.03

Table 3.4 Summary of PCDD/F and PCB WHO-TEQ, and ICES-6 concentrations

FERA Sample No. FERA LIMS No.	21157	21158	21159	21160	21161	21162	21163	21164	21165
Sample Details:	S13-000817 Mussels, Production Area: Fleet Bay, Site Name: Fleet Bay	S13-000818 Common Mussels, Production Area: Busta Voe Lee South, Site Name: Greentaing,	S13-000819 Common Mussels, Production Area: Ronas Voe Mussels 2, Site Name: West of Blackwell	S13-000820 Common Mussels, Production Area: Dales Voe: Scarvar Ayre, Site Name: Scarvar Ayre,	S13-000855 Cockles, Prod Area: Traigh Cille Bhana, Site Name: Traigh Cille Bhana Cockles	S13-000856 Pacific Oysters, Prod Area: Loch Na Keal, Site Name: Eilean Liath	S13-000857 Common Mussels, Production Name: South Uyea, Site Name: South	S13-000858 Pacific Oysters, Prod Area: Baltasound Oysters, Site Name: Baltasound	S13-000859 Common Mussels, Prod Area: Loch Ailort, Site Name: Eilean Dubh
WHO TEQ 2005 ng/kg whole									
PCDD/F	0.10	0.07	0.04	0.08	0.03	0.08	0.05	0.06	0.05
non ortho-PCB	0.06	0.03	0.02	0.04	<0.01	0.03	0.02	0.07	0.03
ortho-PCB	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sum of WHO TEQs (upper)	0.17	0.11	0.07	0.13	0.05	0.12	0.08	0.14	0.09
WHO TEQ 2005 ng/kg Fat									
PCDD/F	10.72	6.01	4.36	7.35	2.63	8.50	3.47	4.96	8.45
non ortho-PCB	6.06	3.05	2.72	4.50	1.63	3.24	1.51	5.83	4.82
ortho-PCB	0.21	0.10	0.08	0.16	0.04	0.13	0.07	0.20	0.14
Sum of WHO TEQs (upper)	16.99	9.16	7.16	12.01	4.30	11.87	5.05	10.99	13.41
SUM: ICES 6 µg/kg whole (upper)	0.33	0.19	0.12	0.23	0.06	0.17	0.13	0.38	0.15
SUM: ICES 6 µg/kg fat (upper)	34.66	17.78	14.73	23.06	4.99	20.71	10.53	34.05	23.73

FERA Sample No.	21166	21167	21168	21169	21170	21171	21172	21173	21175
FERA LIMS No.	S13-000860	S13-000861	S13-000862	S13-000863	S13-000864	S13-000865	S13-000942	S13-000943	S13-000944
Sample Details:	Common Mussels, Prod Area: Loch Ailort 1, Site Name: Site 1	Native Oysters, Prod Area: Loch Ailort 2, Site Name: Ephesus Bay	Pacific Oysters, Prod Area: Loch A Chumhainn, Site Name: Inner Deep Site	Razors, Prod Area: Forth Estuary Largo Bay, Site Name: LargoBay	Surf Clams, Prod Area: Forth Estuary Anstruther, Site Name: Anstruther	Surf Clams, Prod Area: Forth Estuary Pittenweem, Site Name: Pittenweem	Commom Mussels, Prod Area: E Loch Tarbenn, Site Name: Sound of Scalpy	Common Cockles, Prod Area: Northton Beach, Site Name: Northton	Mussels, Prod Area: South Uist 1, Site Name: Loch Skipport
WHO TEQ 2005 ng/kg whole									
PCDD/F	0.06	0.13	0.04	0.07	0.06	0.05	0.05	0.03	0.05
non ortho-PCB	0.03	0.02	0.01	0.05	0.05	0.04	0.02	<0.01	0.02
ortho-PCB	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sum of WHO TEQs (upper)	0.10	0.16	0.06	0.13	0.12	0.10	0.08	0.05	0.08
WHO TEQ 2005 ng/kg Fat									
PCDD/F	6.50	25.30	9.34	4.28	6.51	6.85	5.20	5.91	8.73
non ortho-PCB	3.18	4.66	4.13	3.79	6.48	6.43	2.78	1.85	5.38
ortho-PCB	0.09	0.12	0.11	0.18	0.29	0.30	0.07	0.04	0.12
Sum of WHO TEQs (upper)	9.77	30.08	13.58	8.25	13.28	13.58	8.05	7.80	14.23
SUM: ICES 6 µg/kg whole (upper)	0.15	0.13	0.10	0.46	0.51	0.42	0.14	0.06	0.09
SUM: ICES 6 µg/kg fat (upper)	15.56	22.87	19.90	32.07	62.48	66.20	14.25	6.15	19.91

FERA Sample No.	21176	21177	21178	21179	21183	21184	21185	21186	21187	21188
FERA LIMS No.	S13-000945	S13-000946	S13-000947	S13-000948	S13-001060	S13-001061	S13-001062	S13-001063	S13-001064	S13-001118
Sample Details:	Common Cockles, Prod Area: Campbeltown Loch, Site Name: Kildalloig Bay	Razors, Prod Area; Pirnmill, Site Name: Pirnmill	Common Mussels, Prod Area: Vaila Sound Linga, Site Name: Linga	Common Mussels, Prod Area: Gruting Voe Browland Voe, Site name: Browland Voe	Fresh Mussels, Prod Area: Dornoch Firth, Site Name: Miekle Ferry	Mussels, Prod Area: Loch Eishort, Site Name: Drunfearn	Common Mussels, Prod Area: South of Houss Holm	Mussels, Prod Area: North Uist 2, Site Name: Lochmaddy	Common Mussels, Prod Area: Loch Melfort, Site: Loch Melfort	Common Mussels, Prod Area: Glenuig Bay, Site Name: Glenuig Bay
WHO TEQ 2005 ng/kg whole										
PCDD/F	0.04	0.09	0.06	0.04	0.03	0.03	0.04	0.04	0.06	0.04
non ortho-PCB	0.02	0.05	0.03	0.01	0.01	0.01	0.02	0.02	0.03	0.02
ortho-PCB	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sum of WHO TEQs (upper)	0.07	0.15	0.10	0.06	0.05	0.05	0.07	0.07	0.10	0.07
WHO TEQ 2005 ng/kg Fat										
PCDD/F	10.79	13.05	9.00	7.04	4.28	3.87	11.11	5.10	6.62	9.60
non ortho-PCB	7.62	7.58	5.49	4.94	2.29	2.33	5.85	3.14	3.76	4.56
ortho-PCB	0.33	0.48	0.16	0.12	0.09	0.07	0.17	0.07	0.12	0.13
Sum of WHO TEQs (upper)	18.74	21.11	14.65	12.10	6.66	6.27	17.13	8.31	10.50	14.29
SUM: ICES 6 µg/kg whole (upper)	0.12	0.47	0.16	0.09	0.07	0.09	0.11	0.08	0.19	0.13
SUM: ICES 6 µg/kg fat (upper)	46.84	71.73	28.40	25.26	11.84	14.17	29.76	11.37	24.13	24.84

FERA Sample No. FERA LIMS No.	21200	21201	21205	21213	21235	21236	21237	21238	21239	21240
Sample Details:	S13-001138 Common Mussels, Prod Area: Clift Sound Stream Sound, Site Name: Stream Sound	S13-001139 Common Mussels, Prod Area: Clift Sound Whalwick, Site Name: Whalwick	S13-003272 Common Mussels, Prod Area: Gruting Voe, Site Name: Selivoe	S13-003776 Common Mussels, Prod Area: Basta Voe Site Name: Inner Site 2	S13-004096 Pacific Oysters, Prod Area: Kyle of Tongue, Site Name: Kyle of Tongue	S13-004097 Pacific Oysters, Prod Area: Loch Spelve: Croggan Pier, Site Name: Croggan Pier	S13-004098 Common Mussels, Prod Area: Loch Spelve: Inverlussa, Site Name: Site 1	S13-004099 Pacific Oysters, Prod Area: Loch Fyne: Ardkinglas, Site Name: The Point	S13-004100 Common Mussels, Prod Area: Loch Eil Fassfern, Site Name: Fassfern	S13-004101 Common Mussels, Prod Area: Vementry North, Site Name: Suthra Voe West
WHO TEQ 2005 ng/kg whole										
PCDD/F	0.05	0.06	0.04	0.05	0.08	0.18	0.13	0.10	0.11	0.04
non ortho-PCB	0.07	0.09	0.03	0.02	0.04	0.08	0.06	0.04	0.06	0.01
ortho-PCB	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sum of WHO TEQs (upper)	0.13	0.16	0.08	0.08	0.13	0.27	0.20	0.15	0.18	0.06
WHO TEQ 2005 ng/kg Fat										
PCDD/F	15.05	11.76	12.24	8.99	12.06	18.64	18.34	21.52	10.91	10.48
non ortho-PCB	23.29	19.68	7.66	5.03	6.87	7.83	8.06	7.69	5.37	4.09
ortho-PCB	1.91	1.48	0.20	0.17	0.30	0.21	0.24	0.36	0.23	0.10
Sum of WHO TEQs (upper)	40.25	32.92	20.10	14.19	19.23	26.68	26.64	29.57	16.51	14.67
SUM: ICES 6 µg/kg whole (upper)	0.63	0.76	0.15	0.15	0.27	0.36	0.29	0.30	0.40	0.09
SUM: ICES 6 µg/kg fat (upper)	215.58	172.45	41.41	29.72	41.63	37.52	40.68	64.78	37.64	21.46

FERA Sample No. FERA LIMS No.	21241	21233	21234	21242	21243	21248	21249	21251	21252	21253
Sample Details:	S13-004102 Common Mussels, Prod Area: Langsound, Site Name: Langsound	S13-003917 Common Mussels, Prod Area: Papa Little Voe, Site Name: Papa Little Voe	S13-003918 Common Mussels, Prod Area: Loch Erisort, Site Name: Garbh Eilean	S13-004378 Common Cockles, Prod Area: Loch Na Cille, Site Name: Loch Na Cille Cockles	S13-004379 Common Mussels, Prod Area: East Firth, Site Name: Site 1	S13-004621 Pacific Oyster Otter Ferry	S13-004622 Common Mussels Weisdale Voe N Flotta	S13-004706 Razor; Production area: North Bay; Site name: Barassie	S13-004726 Common mussel; Prod area: loch Roag Miavaig; Site name: Miauaig	S13-004727 Common mussel; Prod area: loch Roag Barraglom; Site name: loch Barraglom
WHO TEQ 2005 ng/kg whole										
PCDD/F	0.10	0.07	0.04	0.03	0.06	0.20	0.07	0.10	0.06	0.07
non ortho-PCB	0.18	0.03	0.02	0.01	0.03	0.11	0.03	0.07	0.02	0.03
ortho-PCB	0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.01	<0.01	<0.01
Sum of WHO TEQs (upper)	0.29	0.11	0.07	0.05	0.10	0.32	0.11	0.18	0.09	0.11
WHO TEQ 2005 ng/kg Fat										
PCDD/F	17.74	7.89	9.53	7.01	8.76	20.52	11.53	11.11	7.78	7.83
non ortho-PCB	31.92	3.95	5.33	5.51	4.88	11.22	6.02	7.94	3.95	4.14
ortho-PCB	2.09	0.11	0.16	0.12	0.19	0.59	0.20	0.74	0.11	0.12
Sum of WHO TEQs (upper)	51.75	11.95	15.02	12.64	13.83	32.33	17.75	19.79	11.84	12.09
SUM: ICES 6 µg/kg whole (upper)	1.33	0.15	0.16	0.06	0.18	1.08	0.17	0.94	0.15	0.18
SUM: ICES 6 µg/kg fat (upper)	230.74	19.55	29.41	17.67	29.15	111.81	29.94	105.68	20.75	22.74

FERA Sample No. FERA LIMS No.	21254	21255	21267	21268	21273	21274	21275	21341
Sample Details:	S13-004728 Common mussel; Prod area: loch Roag Torrinish; Site name: loch Torrinish	S13-004765 Dredged wedge clams, production area and site name: Stevenston sands	S13-005066 Pacific oyster, Loch Kishorn North oysters	S13-005067 Pacific oyster, Loch Creran Upper oysters	S13-005206 Queen scallops, Loch Fyne, Stonefields, North Bay	S13-005207 Common mussel, Loch Leven Upper	S13-005208 Pacific oyster,Comarty Bay West	S13-023932 Razor Shells, Prod Area: Fersness Bay, Site Name: Fersness Razors
WHO TEQ 2005 ng/kg whole								
PCDD/F	0.07	0.08	0.06	0.10	0.17	0.08	0.07	0.04
non ortho-PCB	0.03	0.02	0.03	0.04	0.05	0.03	0.06	0.01
ortho-PCB	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01
Sum of WHO TEQs (upper)	0.11	0.11	0.10	0.15	0.23	0.12	0.14	0.06
WHO TEQ 2005 ng/kg Fat								
PCDD/F	5.25	12.45	10.32	14.90	17.42	12.48	10.51	1.78
non ortho-PCB	2.86	3.91	5.05	5.59	5.01	4.52	10.68	0.92
ortho-PCB	0.09	0.50	0.13	0.18	0.48	0.14	0.51	0.03
Sum of WHO TEQs (upper)	8.20	16.86	15.50	20.67	22.91	17.14	21.70	2.73
SUM: ICES 6 µg/kg whole (upper)	0.20	0.37	0.16	0.20	1.09	0.17	0.59	0.07
SUM: ICES 6 µg/kg fat (upper)	15.86	61.24	24.81	29.74	110.64	27.19	98.16	4.32

Table 3.5 PAH concentrations ($\mu\text{g}/\text{kg}$ whole weight)

FERA Sample No.	21157	21158	21159	21160	21161	21162	
FERA LIMS No.	S13-000817	S13-000818	S13-000819	S13-000820	S13-000855	S13-000856	
Sample Details:	Mussels, Production Area: Fleet Bay, Site Name: Fleet Bay	Common Mussels, Production Area: Busta Voe Lee South, Site Name: Greentaing,	Common Mussels, Production Area: Ronas Voe Mussels 2, Site Name: West of Blackwell	Common Mussels, Production Area: Dales Voe Scarvar Ayre, Site Name: Scarvar Ayre,	Cockles, Prod Area: Traigh Cille Bhana, Site Name: Traigh Cille Bhana Cockles	Pacific Oysters, Prod Area: Loch Na Keal, Site Name: Eilean Liath	
	PAH						
	$\mu\text{g}/\text{kg}$ whole						
	acenaphthylene	1.85	0.22	<0.19	0.18	<0.13	0.15
acenaphthene	<0.32	<0.35	<0.35	<0.35	<0.35	<0.32	
fluorene	0.54	<0.41	<0.41	<0.41	<0.41	<0.35	
phenanthrene	2.61	0.58	<0.56	0.57	<0.57	0.72	
anthracene	1.24	0.15	<0.09	0.11	<0.09	0.10	
fluoranthene	4.08	0.98	<0.39	0.82	<0.39	1.78	
benzo[c]fluorene	0.20	0.04	0.02	0.03	<0.02	0.10	
pyrene	3.23	0.84	<0.41	0.62	<0.41	1.18	
benzo[ghi]fluoranthene	0.98	0.54	0.21	0.39	0.09	0.72	
benz (a) anthracene	1.27	0.35	0.21	0.25	0.09	0.56	
benzo[b]naphtho[2,1-d]thiophene	0.26	<0.09	<0.04	<0.04	<0.04	0.10	
cyclopenta[c,d]pyrene	0.06	0.09	0.07	0.10	0.03	0.08	
chrysene	1.35	0.61	0.46	0.55	0.19	1.01	
5-methylchrysene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
benzo[b]fluoranthene	1.98	0.91	0.55	0.70	0.15	1.89	
benzo[j]fluoranthene	0.77	0.39	0.25	0.28	0.10	0.50	
benzo[k]fluoranthene	0.78	0.35	0.22	0.25	0.09	0.77	
benzo[e]pyrene	2.15	0.86	0.38	0.66	0.13	1.21	
benzo[a]pyrene	0.98	0.21	0.13	0.16	<0.09	0.34	
indeno[1,2,3-cd]pyrene	0.86	0.28	0.19	0.20	<0.12	0.33	
dibenz[ah]anthracene	0.29	<0.09	<0.06	<0.08	<0.05	0.14	
benzo-[g,h,i]perylene	1.34	0.48	0.30	0.44	0.09	0.36	
anthanthrene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
dibenzo[a,l]pyrene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
dibenzo[a,e]pyrene	0.27	<0.1	<0.1	<0.1	<0.1	<0.1	
dibenzo[a,i]pyrene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
dibenzo[a,h]pyrene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
coronene	0.39	0.12	<0.1	0.12	<0.1	<0.1	
PAH 4 Sum Lower $\mu\text{g}/\text{kg}$	5.58	2.08	1.35	1.66	0.43	3.80	
PAH 4 Sum Upper $\mu\text{g}/\text{kg}$	5.58	2.08	1.35	1.66	0.52	3.80	

FERA Sample No.	21163	21164	21165	21166	21167	21168
FERA LIMS No.	S13-000857	S13-000858	S13-000859	S13-000860	S13-000861	S13-000862
Common	Common	Pacific	Common	Common	Native	Pacific
Mussels,	Mussels,	Oysters,	Mussels,	Mussels,	Oysters,	Oysters,
Production	Prod Area:	Prod Area:	Prod Area:	Prod Area:	Prod Area:	Prod Area:
Name:	Baltasound	Baltasound	Loch	Loch	Loch	Loch A
South	Oysters,	Oysters,	Ailort,	Ailort 1,	Ailort 2,	Chumhainn,
Uyea, Site	Site Name:	Site Name:	Site Name:	Site Name:	Site Name:	Site Name:
Name:	Baltasound	Baltasound	Eilean	Site 1	Ephesus	Inner Deep
South			Dubh	Site 1	Bay	Site

Sample Details:

PAH

µg/kg whole

acenaphthylene	<0.13	0.24	0.32	0.21	0.21	<0.11
acenaphthene	<0.35	<0.35	<0.32	<0.35	<0.22	<0.22
fluorene	<0.41	<0.41	<0.35	<0.41	<0.33	<0.33
phenanthrene	<0.56	0.65	0.78	<0.57	0.56	<0.39
anthracene	<0.09	0.23	0.19	0.16	0.22	<0.09
fluoranthene	<0.39	1.61	1.23	0.90	1.14	0.86
benzo[c]fluorene	<0.03	0.08	0.07	0.08	0.08	0.04
pyrene	<0.41	1.38	1.01	0.55	0.57i	0.57i
benzo[ghi]fluoranthene	0.17	0.40	0.46	0.43	0.40	0.25
benz (a) anthracene	0.14	0.27	0.40	0.33	0.44	0.14
benzo[b]naphtho[2,1-d]thiophene	<0.04	<0.04	0.08	0.06	<0.07	0.03
cyclopenta[c,d]pyrene	0.05	0.04	0.09	0.09	0.04	0.01
chrysene	0.29	0.43	0.79	0.70	0.57	0.19
5-methylchrysene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
benzo[b]fluoranthene	0.40	0.81	1.22	0.92	1.29	0.52
benzo[j]fluoranthene	0.17	0.18	0.52	0.44	0.36	0.11
benzo[k]fluoranthene	0.16	0.34	0.40	0.33	1.08	0.20
benzo[e]pyrene	0.34	0.62	1.00	0.86	0.63	0.46
benzo[a]pyrene	0.09	0.11	0.32	0.23	0.24	<0.1
indeno[1,2,3-cd]pyrene	<0.13	<0.13	0.31	0.23	0.35	<0.12
dibenz[ah]anthracene	<0.05	<0.07	<0.11	<0.1	<0.15	<0.07
benzo-[g,h,i]perylene	0.19	0.15	0.39	0.38	0.31	0.14
anthanthrene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
dibenzo[a,l]pyrene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
dibenzo[a,e]pyrene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
dibenzo[a,i]pyrene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
dibenzo[a,h]pyrene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
coronene	<0.1	<0.1	<0.12	<0.1	<0.1	<0.1
PAH 4 Sum Lower µg/kg	0.92	1.62	2.73	2.18	2.54	0.85
PAH 4 Sum Upper µg/kg	0.92	1.62	2.73	2.18	2.54	0.95

i - indicative

FERA Sample No.	21169	21170	21171	21172	21173	21175
FERA LIMS No.	S13-000863	S13-000864	S13-000865	S13-000942	S13-000943	S13-000944
Razors, Prod Area: Forth Estuary Largo Bay, Site Name: LargoBay	Surf Clams, Prod Area: Forth Estuary Anstruther, Site Name: Anstruther	Surf Clams, Prod Area: Forth Estuary Pittenweem, Site Name: Pittenweem	Surf Clams, Prod Area: Forth Estuary Pittenweem, Site Name: Pittenweem	Commom Mussels, Prod Area: E Loch Tarbenn, Site Name: Sound of Scalpy	Common Cockles, Prod Area: Northton Beach, Site Name: Northton	Mussels, Prod Area: South Uist 1, Site Name: Loch Skipport

Sample Details:

PAH

µg/kg whole

acenaphthylene	1.46	1.77	1.32	<0.31	<0.05	<0.12
acenaphthene	0.40	<0.23	<0.23	<0.22	<0.19	<0.23
fluorene	0.74	<0.33	<0.33	<0.32	<0.28	<0.33
phenanthrene	2.89	1.08	0.97	1.13	<0.33	<0.39
anthracene	1.61	1.34	1.02	0.31	<0.02	0.10
fluoranthene	7.16	2.11	1.88	0.95	0.26	0.58
benzo[c]fluorene	0.61	0.17	0.15	0.09	0.01	0.03
pyrene	6.53i	2.11i	1.83	0.98	<0.27	0.51i
benzo[ghi]fluoranthene	2.08	0.56	0.53	0.46	0.07	0.17
benz (a) anthracene	2.83	0.93	0.88	0.32	0.07	0.13
benzo[b]naphtho[2,1-d]thiophene	0.46	0.13	0.12	0.08	<0.02	0.03
cyclopenta[c,d]pyrene	0.07	0.02	0.02	0.07	<0.01	<0.01
chrysene	3.22	0.85	0.89	0.35	0.15	0.22
5-methylchrysene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
benzo[b]fluoranthene	2.97	1.03	1.04	1.07	0.19	0.26
benzo[j]fluoranthene	1.24	0.48	0.48	0.41	0.08	0.11
benzo[k]fluoranthene	1.44	0.60	0.58	0.35	0.09	0.09
benzo[e]pyrene	3.28	1.50	1.44	1.09	0.15	0.28
benzo[a]pyrene	1.74	0.73	0.71	0.20	<0.08	<0.1
indeno[1,2,3-cd]pyrene	0.89	0.62	0.62	0.33	0.17	<0.13
dibenz[ah]anthracene	0.27	0.17	0.17	<0.11	<0.06	<0.05
benzo-[g,h,i]perylene	1.13	0.94	0.93	0.52	0.15	0.17
anthanthrene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
dibenzo[a,l]pyrene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
dibenzo[a,e]pyrene	<0.21	<0.19	<0.19	<0.1	<0.1	<0.1
dibenzo[a,i]pyrene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
dibenzo[a,h]pyrene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
coronene	0.35	0.31	0.32	0.14	<0.1	<0.1

PAH 4 Sum Lower µg/kg 10.76 3.54 3.52 1.94 0.41 0.61

PAH 4 Sum Upper µg/kg 10.76 3.54 3.52 1.94 0.49 0.71

i - indicative

FERA Sample No. FERA LIMS No.	21176	21177	21178	21179	21183	21184
	S13-000945	000946	000947	000948	001060	001061
	Common Cockles, Prod Area: Campbelto wn Loch, Site Name: Kildalloig Bay	Razors, Prod Area; Pirnmill, Site Name: Pirnmill	Common Mussels, Prod Area: Vaila Sound Linga, Site Name: Linga	Common Mussels, Prod Area: Gruting Voe Browland Voe, Site name: Browland Voe	Fresh Mussels, Prod Area: Dornoch Firth, Site Name: Miekle Ferry	Mussels, Prod Area: Loch Eishort, Site Name: Drumfearn
Sample Details:						

PAH

µg/kg whole						
acenaphthylene	0.41	1.95	0.33	<0.22	<0.22	0.24
acenaphthene	<0.22	<0.22	<0.47	<0.47	<0.47	<0.47
fluorene	<0.32	0.38	<0.44	<0.44	<0.44	<0.44
phenanthrene	0.43	1.89	0.55	<0.51	0.69	0.79
anthracene	0.35	1.69	0.23	<0.06	0.15	0.16
fluoranthene	1.55	4.90	0.81	0.46	1.09	0.75
benzo[c]fluorene	0.12	0.46	<0.05	<0.03	0.07	0.06
pyrene	1.81	4.66i	0.77i	0.51i	1.08	0.72
benzo[ghi]fluoranthene	0.68	1.37	0.32	0.24	0.30	0.31
benz (a) anthracene	0.88	2.38	0.27	0.21	0.35	0.22
benzo[b]naphtho[2,1-d]thiophene	0.17	0.39	0.05	0.03	<0.05	<0.06
cyclopenta[c,d]pyrene	0.05	0.06	0.05	0.03	0.01	0.05
chrysene	1.06	2.99	0.37	0.37	0.37	0.41
5-methylchrysene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
benzo[b]fluoranthene	1.70	3.57	0.66	0.51	0.56	0.54
benzo[j]fluoranthene	0.94	1.55	0.29	0.22	0.26	0.24
benzo[k]fluoranthene	1.04	1.77	0.22	0.20	0.24	0.22
benzo[e]pyrene	1.77	3.06	0.66	0.37	0.44	0.56
benzo[a]pyrene	1.09	1.73	0.18	0.11	0.23	0.13
indeno[1,2,3-cd]pyrene	1.00	1.00	0.24	0.18	0.31	<0.2
dibenz[ah]anthracene	0.28	0.32	<0.08	0.04	<0.09	<0.07
benzo-[g,h,i]perylene	1.06	1.17	0.39	0.24	0.34	0.29
anthanthrene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
dibenzo[a,l]pyrene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
dibenzo[a,e]pyrene	<0.18	<0.17	<0.1	<0.1	<0.1	<0.1
dibenzo[a,i]pyrene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
dibenzo[a,h]pyrene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
coronene	0.22	0.25	0.10	<0.1	0.13	<0.1
PAH 4 Sum Lower µg/kg	4.73	10.67	1.48	1.20	1.51	1.30
PAH 4 Sum Upper µg/kg	4.73	10.67	1.48	1.20	1.51	1.30

i - indicative

FERA Sample No.	21185	21186	21187	21188	21200	21201	21205
FERA LIMS No.	S13-001062	S13-001063	S13-001064	S13-001118	S13-001138	S13-001139	S13-003272
Sample Details:	Common Mussels, Prod Area: South of Houss Holm	Mussels, Prod Area: North Uist 2, Site Name: Lochmaddy	Common Mussels, Prod Area: Loch Melfort, Site: Loch Melfort	Common Mussels, Prod Area: Glenuig Bay, Site Name: Glenuig Bay	Common Mussels, Prod Area: Clift Sound, Site Name: Clift Sound	Common Mussels, Prod Area: Clift Sound, Site Name: Clift Sound	Common Mussels, Prod Area: Clift Sound, Site Name: Clift Sound

PAH

µg/kg whole							
acenaphthylene	<0.21	<0.21	0.40	0.39	0.40	0.39	0.15
acenaphthene	<0.45	<0.46	<0.47	<0.46	<0.45	<0.46	<0.27
fluorene	<0.42	<0.43	0.63	<0.43	<0.42	<0.43	<0.31
phenanthrene	0.91	0.59	2.09	0.97	0.59	0.68	<0.43
anthracene	0.15	0.12	0.67	0.26	0.28	<0.23	0.07
fluoranthene	1.07	0.82	1.97	1.37	0.87	1.00	0.45
benzo[c]fluorene	0.06	0.04	0.13	0.10	0.07	<0.08	0.03
pyrene	1.32	0.63i	1.91	1.03	1.00	1.06	0.43i
benzo[ghi]fluoranthene	0.39	0.23	0.54	0.53	0.44	0.47	0.23
benz (a) anthracene	0.30	0.18	0.39	0.33	0.35	0.35	0.23
benzo[b]naphtho[2,1-d]thiophene	0.06	0.04	0.19	0.08	<0.08	<0.07	<0.03
cyclopenta[c,d]pyrene	0.05	0.01	0.05	0.06	0.07	0.06	<0.01
chrysene	0.56	0.29	0.68	0.56	0.53	0.63	0.30
5-methylchrysene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
benzo[b]fluoranthene	0.69	0.33	0.72	0.88	0.93	0.98	0.55
benzo[j]fluoranthene	0.31	0.16	0.33	0.39	0.41	0.43	0.24
benzo[k]fluoranthene	0.24	0.13	0.25	0.29	0.32	0.38	0.20
benzo[e]pyrene	0.63	0.34	1.00	0.95	0.93	1.00	0.43
benzo[a]pyrene	0.17	0.08	0.18	0.17	0.21	0.23	0.13
indeno[1,2,3-cd]pyrene	0.29	0.16	0.22	0.25	0.33	0.41	0.21
dibenz[ah]anthracene	<0.08	<0.06	<0.09	<0.09	<0.09	<0.11	<0.07
benzo-[g,h,i]perylene	0.35	0.22	0.44	0.43	0.40	0.56	0.29
anthanthrene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
dibenzo[a,l]pyrene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
dibenzo[a,e]pyrene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
dibenzo[a,i]pyrene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
dibenzo[a,h]pyrene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
coronene	0.11	<0.1	0.11	0.11	0.10	0.15	<0.1
PAH 4 Sum Lower µg/kg	1.72	0.88	1.97	1.94	2.02	2.19	1.21
PAH 4 Sum Upper µg/kg	1.72	0.88	1.97	1.94	2.02	2.19	1.21

FERA Sample No.	21213	21235	21236	21237	21238	21239	21240
FERA LIMS No.	S13-003776	S13-004096	S13-004097	S13-004098	S13-004099	S13-004100	S13-004101
Sample Details:	Common Mussels, Prod Area: Basta Voe Cove, Site Name: Inner Site 2	Pacific Oysters, Prod Area: Kyle of Tongue, Site Name: Kyle of Tongue	Pacific Oysters, Prod Area: Loch Spelve: Croggan Pier, Site Name: Croggan Pier	Common Mussels, Prod Area: Loch Spelve: Inverlussa, Site Name: Site 1	Pacific Oysters, Prod Area: Loch Fyne: Ardkinglas, Site Name: The Point	Common Mussels, Prod Area: Loch Eil: Fassfern, Site Name: Fassfern	Common Mussels, Prod Area: Ventry North, Site Name: Suthra Voe West

PAH

µg/kg whole	21213	21235	21236	21237	21238	21239	21240
acenaphthylene	0.15	<0.16	0.47	0.76	0.55	0.90	<0.07
acenaphthene	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27
fluorene	<0.31	<0.31	0.32	<0.31	<0.31	<0.31	<0.31
phenanthrene	0.43	0.53	1.36	1.19	0.57	1.35	<0.43
anthracene	0.10	0.12	0.42	0.55	0.61	0.76	<0.03
fluoranthene	0.57	1.26	3.81	2.21	2.51	2.99	<0.34
benzo[c]fluorene	0.04	0.07	0.24	0.22	0.18	0.25	<0.01
pyrene	0.42i	0.67	2.59i	1.51	2.37i	2.77i	<0.36
benzo[ghi]fluoranthene	0.22	0.50	1.69	1.04	1.11	1.40	0.09
benz (a) anthracene	0.18	0.06	1.21	0.76	1.06	1.22	0.06
benzo[b]naphtho[2,1-d]thiophene	<0.03	<0.06	0.21	0.17	0.18	0.30	<0.03
cyclopenta[c,d]pyrene	0.02	0.02	0.18	0.11	0.08	0.10	<0.01
chrysene	0.29	0.53	1.36	1.29	1.60	1.67	0.15
5-methylchrysene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
benzo[b]fluoranthene	0.45	0.95	4.63	2.44	2.84	5.50	0.31
benzo[j]fluoranthene	0.20	0.20	1.08	0.89	0.86	1.60	0.13
benzo[k]fluoranthene	0.14	0.34	1.87	0.76	1.19	1.86	0.09
benzo[e]pyrene	0.40	0.67	3.43	2.69	2.25	5.84	0.21
benzo[a]pyrene	0.11	0.09	0.69	0.46	0.68	1.06	<0.08
indeno[1,2,3-cd]pyrene	0.13	0.13	0.60	0.66	0.55	0.98	0.15
dibenz[ah]anthracene	<0.05	<0.07	0.31	0.19	0.23	0.38	<0.05
benzo-[g,h,i]perylene	0.19	0.15	0.90	1.05	0.68	1.59	0.20
anthanthrene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
dibenzo[a,l]pyrene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
dibenzo[a,e]pyrene	<0.1	<0.1	<0.1	0.11	<0.1	<0.2	<0.1
dibenzo[a,i]pyrene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
dibenzo[a,h]pyrene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
coronene	<0.1	<0.1	0.13	0.27	0.12	0.26	<0.1
PAH 4 Sum Lower µg/kg	1.03	1.63	7.89	4.95	6.18	9.45	0.52
PAH 4 Sum Upper µg/kg	1.03	1.63	7.89	4.95	6.18	9.45	0.60

i - indicative

FERA Sample No.	21241	21233	21234	21242	21243	21248	21249
FERA LIMS No.	S13-004102	S13-003917	S13-003918	S13-004378	S13-004379	S13-004621	S13-004622
Sample Details:	Common Mussels, Prod Area: Langsound, Langsound	Common Mussels, Prod Area: Papa Little Voe, Site Name: Papa Little Voe	Common Mussels, Prod Area: Loch Erisort, Site Name: Garbh Eilean	Common Cockles, Prod Area: Loch Na Cille, Site Name: Loch Na Cille Cockles	Common Mussels, Prod Area: East Firth, Site Name: Site 1	Pacific Oyster, Prod Area: Otter Ferry	Common Mussels, Prod Area: Weisdale Voe N Flotta

PAH

$\mu\text{g/kg}$ whole							
acenaphthylene	0.84	0.18	0.38	<0.1	0.25	1.59	0.21
acenaphthene	<0.27	<0.27	<0.41	<0.41	<0.41	<0.41	<0.41
fluorene	0.34	<0.31	<0.42	<0.42	<0.42	0.43	<0.42
phenanthrene	1.84	0.60	0.62	<0.48	0.52	1.73	<0.48
anthracene	0.55	0.13	0.19	0.06	0.15	1.77	0.12
fluoranthene	2.03	0.73	0.91	0.68	0.84	6.57	0.69
benzo[c]fluorene	0.18	0.04	0.05	0.04	0.04	0.43	0.03
pyrene	2.16i	0.54i	0.82	0.55	0.77	6.00	0.59
benzo[ghi]fluoranthene	0.80	0.37	0.37	0.26	0.42	2.28	0.33
benz (a) anthracene	0.58	0.24	0.30	0.28	0.28	1.71	0.30
benzo[b]naphtho[2,1-d]thiophene	0.10	0.05	0.08	0.06	0.06	0.38	0.06
cyclopenta[c,d]pyrene	0.07	0.05	0.02	0.03	0.03	0.19	0.04
chrysene	0.86	0.45	0.54	0.51	0.58	2.01	0.46
5-methylchrysene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
benzo[b]fluoranthene	1.36	0.78	0.91	0.50	0.86	4.25	0.75
benzo[j]fluoranthene	0.59	0.32	0.39	0.28	0.35	1.49	0.32
benzo[k]fluoranthene	0.43	0.28	0.36	0.25	0.30	1.53	0.24
benzo[e]pyrene	1.69	0.73	0.79	0.46	0.75	3.60	0.77
benzo[a]pyrene	0.35	0.13	0.24	0.24	0.18	0.78	0.13
indeno[1,2,3-cd]pyrene	0.59	0.24	0.48	0.32	0.31	0.62	0.39
dibenz[ah]anthracene	0.13	0.06	<0.14	<0.1	<0.1	0.29	<0.1
benzo-[g,h,i]perylene	0.82	0.42	0.56	0.32	0.42	0.85	0.48
anthanthrene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
dibenzo[a,l]pyrene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
dibenzo[a,e]pyrene	<0.14	<0.1	<0.15	<0.1	<0.1	<0.1	<0.1
dibenzo[a,i]pyrene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
dibenzo[a,h]pyrene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
coronene	0.21	0.12	0.23	0.10	0.12	<0.1	0.16
PAH 4 Sum Lower $\mu\text{g/kg}$	3.15	1.60	1.99	1.53	1.90	8.75	1.64
PAH 4 Sum Upper $\mu\text{g/kg}$	3.15	1.60	1.99	1.53	1.90	8.75	1.64

i - indicative

FERA Sample No. FERA LIMS No.	21251 S13- 004706	21252 S13- 004726	21253 S13- 004727	21254 S13- 004728	21255 S13-004765	21469 S13-042470
Sample Details:	Razor; Production area: North Bay; Site name: Barassie	Common mussel; Prod area: loch Roag Miavaig; Site name: Miauaig	Common mussel; Prod area: loch Roag Barraglom; Site name: loch Barraglom	Common mussel; Prod area: loch Roag Torrinish; Site name: loch Torrinish	Dredged wedge clams. Site name: Stevenson sands Collected: 20.2.13	Wedge Clams, Prod Area and Site Name: Stevenson Sands, SIN: NA627123923, Grid Ref: NS2754 3977, Collected: 8.7.13
ng/kg whole						
acenaphthylene	3.21	0.16	0.24	0.23	1.59	0.15
acenaphthene	<0.41	<0.41	<0.41	<0.41	0.43	<0.35
fluorene	0.79	<0.42	<0.42	<0.42	0.66	0.48
phenanthrene	4.22	0.52	0.59	0.81	3.22	2.41
anthracene	3.54	0.10	0.16	0.19	1.91	0.50
fluoranthene	14.07	0.62	0.85	1.02	7.10	6.03
benzo[c]fluorene	1.01	0.04	0.04	0.05	0.37	0.21
pyrene	11.03	0.42	0.59	0.65i	7.22i	5.65i
benzo[ghi]fluoranthene	2.99	0.23	0.34	0.35	1.56	1.12
benz (a) anthracene	6.22	0.06	0.21	0.17	4.06	2.86
benzo[b]naphtho[2,1-d]thiophene	0.93	0.04	0.06	0.05	0.87	0.45
cyclopenta[c,d]pyrene	0.11	0.02	0.03	0.03	0.06	0.05
chrysene	6.19	0.31	0.53	0.46	5.42	3.55
5-methylchrysene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
benzo[b]fluoranthene	6.29	0.41	0.83	0.67	6.55	3.32
benzo[j]fluoranthene	2.88	0.19	0.35	0.27	2.84	1.45
benzo[k]fluoranthene	3.21	0.14	0.28	0.21	3.40	1.79
benzo[e]pyrene	6.86	0.42	0.70	0.66	4.50	3.08
benzo[a]pyrene	4.56	<0.09	0.16	0.12	5.60	2.64
indeno[1,2,3-cd]pyrene	1.53	0.20	0.36	0.27	4.07	3.36
dibenz[ah]anthracene	0.53	<0.07	<0.11	<0.09	1.04	0.50
benzo-[g,h,i]perylene	1.88	0.28	0.46	0.39	4.94	2.94
anthanthrene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
dibenzo[a,l]pyrene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
dibenzo[a,e]pyrene	0.25	<0.1	<0.1	<0.1	0.72	0.39
dibenzo[a,i]pyrene	<0.1	<0.1	<0.1	<0.1	0.23	0.11
dibenzo[a,h]pyrene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
coronene	0.29	0.11	0.18	0.14	0.99	0.60
PAH 4 Sum Lower ug/kg	23.26	0.78	1.73	1.42	21.63	12.37
PAH 4 Sum Upper ug/kg	23.26	0.87	1.73	1.42	21.63	12.37

i - indicative

FERA Sample No. FERA LIMS No.	21267 S13- 005066	21268 S13- 005067	21273 S13- 005206	21274 S13- 005207	21275 S13-005208	21341 S13- 023932
Sample Details:	Pacific oyster, Loch Kishorn North oysters	Pacific oyster, Loch Creran Upper oysters	Queen scallops, Loch Fyne, Stonefields , North Bay	Common mussel, Loch Leven Upper	Pacific oyster, Comarty Bay West	Prod Area: Fersness Bay, Site Name: Fersness Razors
ng/kg whole						
acenaphthylene	0.10	0.24	2.38	0.45	0.18	0.13
acenaphthene	<0.3	<0.31	<0.3	<0.31	<0.31	<0.31
fluorene	<0.33	<0.33	0.38	<0.33	<0.33	<0.33
phenanthrene	0.46	1.03	1.61	0.72	1.02	<0.45
anthracene	0.12	0.27	1.72	0.45	0.19	0.09
fluoranthene	1.09	2.83	6.60	1.88	2.09	0.66
benzo[c]fluorene	0.06	0.18	0.36	0.19	0.10	<0.03
pyrene	0.77	1.67	5.69i	2.35i	1.61	<0.32
benzo[ghi]fluoranthene	0.44	1.06	4.45	1.11	0.59	0.19
benz (a) anthracene	0.28	0.75	3.56	1.16	0.51	0.22
benzo[b]naphtho[2,1-d]thiophene	0.06	0.11	0.77	0.33	<0.03	0.05
cyclopenta[c,d]pyrene	0.04	0.10	0.35	0.06	0.01	0.08
chrysene	0.26	0.82	5.64	2.06	0.54	0.54
5-methylchrysene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
benzo[b]fluoranthene	0.89	2.49	8.79	13.08	1.04	0.54
benzo[j]fluoranthene	0.22	0.54	3.75	2.89	0.26	0.21
benzo[k]fluoranthene	0.33	0.93	4.55i	4.42	0.41	0.25
benzo[e]pyrene	0.64	1.87	5.34	10.09	0.75	0.31
benzo[a]pyrene	0.11	0.30	3.59	4.15	0.22	<0.1
indeno[1,2,3-cd]pyrene	0.15	0.33	2.94	3.70	0.22	0.22
dibenz[ah]anthracene	0.06	0.16	1.03	1.43	<0.11	<0.06
benzo-[g,h,i]perylene	0.20	0.44	2.59	5.67	0.26	0.16
anthanthrene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
dibenzo[a,l]pyrene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
dibenzo[a,e]pyrene	<0.1	<0.1	0.34	0.77	<0.1	<0.1
dibenzo[a,i]pyrene	<0.1	<0.1	<0.1	0.14	<0.1	<0.1
dibenzo[a,h]pyrene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
coronene	<0.1	<0.1	0.55	0.80	<0.1	0.10
PAH 4 Sum Lower ug/kg	1.54	4.36	21.58	20.45	2.31	1.30
PAH 4 Sum Upper ug/kg	1.54	4.36	21.58	20.45	2.31	1.40

i - indicative

Table 3.6 Heavy metal concentrations (mg/kg whole weight)

FERA sample No.	21157	21158	21159	21160	21161	21162	21163	21164	21165	21166
FERA LIMS code	S13-000817	S13-000818	S13-000819	S13-000820	S13-000855	S13-000856	S13-000857	S13-000858	S13-000859	S13-000860
Sample Details	Mussels, Production Area: Fleet Bay, Site Name: Fleet Bay	Common Mussels, Production Area: Busta Voe Lee South, Site Name: Greentaing,	Common Mussels, Production Area: Ronas Voe Mussels 2, Site Name: West of Blackwell	Common Mussels, Production Area: Dales Voe: Scarvar Ayre, Site Name: Scarvar Ayre,	Cockles, Prod Area: Traigh Cille Bhana, Site Name: Traigh Cille Bhana Cockles	Pacific Oysters, Prod Area: Loch Na Keal, Site Name: Eilean Liath	Common Mussels, Production Name: Uyea, Site Name: South	Pacific Oysters, Prod Area: Baltasound Oysters, Site Name: Baltasound	Common Mussels, Prod Area: Loch Ailort, Site Name: Eilean Dubh	Common Mussels, Prod Area: Loch Ailort 1, Site Name: Site 1
mg/kg whole weight										
Cr	0.25	~0.07	~0.08	~0.07	~0.09	~0.08	0.10	0.39	~0.06	~0.08
Mn	8.21	0.68	0.35	0.42	0.65	2.22	0.66	1.70	1.25	1.74
Co	0.077	0.018	0.016	0.014	0.063	0.018	0.022	0.040	0.024	0.023
Ni	0.22	~0.07	~0.09	~0.05	1.11	~0.06	~0.07	0.33	~0.05	~0.09
Cu	0.73	0.91	0.65	0.64	0.23	7.54	0.61	3.09	0.71	0.60
Zn	7.68	14.5	13.9	13.7	3.93	148	10.8	111	8.84	8.24
As	1.59	1.27	1.05	1.08	0.85	1.77	1.27	1.28	1.29	1.40
Se	0.349	0.359	0.294	0.292	0.144	0.221	0.359	0.159	0.380	0.310
Ag	~0.005	<0.003	<0.003	<0.003	0.013	0.413	~0.003	0.100	0.017	~0.008
Cd	0.099	0.104	0.129	0.101	0.058	0.175	0.292	0.182	0.073	0.060
Hg	0.017	~0.004	~0.004	~0.004	~0.005	0.010	~0.004	0.012	0.008	0.010
Pb	0.336	0.102	0.114	0.098	0.022	0.035	0.060	0.038	0.069	0.070

' ~ ' indicates the measured value was above LoD but below LoQ

FERA sample No.	21167	21168	21169	21170	21171	21172	21173	21175	21176	21177	
FERA LIMS code	S13-000861	S13-000862	S13-000863	S13-000864	S13-000865	S13-000942	S13-000943	S13-000944	S13-000945	S13-000946	
Sample Details	Native Oysters, Prod Area: Loch Ailort 2, Site Name: Ephesus Bay	Pacific Oysters, Prod Area: Loch A Chumhainn, Site Name: Inner Deep Site	Razors, Prod Area: Forth Estuary Largo Bay, Site Name: LargoBay	Surf Clams, Prod Area: Forth Estuary Anstruther, Site Name: Anstruther	Surf Clams, Prod Area: Forth Estuary Pittenweem, Site Name: Pittenweem	Common Mussels, Prod Area: E Loch Tarbenn, Site Name: Sound of Scalpy	Common Cockles, Prod Area: Northton Beach, Site Name: Northton	Mussels, Prod Area: South Uist 1, Site Name: Loch Skipport	Common Cockles, Prod Area: Campbeltown Loch, Site Name: Kildalloig Bay	Razors, Prod Area: Pirmill, Site Name: Pirmill	
mg/kg whole weight											
Cr	~0.04	~0.07	0.15	0.13	0.12	~0.09	0.10	0.13	0.16	0.23	
Mn	1.10	2.72	1.47	3.74	2.93	1.47	0.78	0.66	2.93	2.20	
Co	0.014	0.031	0.059	0.143	0.129	0.023	0.086	0.022	0.146	0.078	
Ni	<0.03	~0.07	~0.05	0.22	0.17	~0.09	1.71	~0.08	1.55	0.14	
Cu	2.60	4.36	1.26	1.04	0.99	0.61	0.23	0.40	0.31	0.94	
Zn	253	79.6	14.1	9.61	8.21	8.72	3.13	8.92	6.63	12.7	
As	1.20	0.94	1.33	1.95	1.81	1.62	1.01	2.69	1.26	1.60	
Se	0.225	0.110	0.281	0.534	0.491	0.408	0.159	0.211	0.205	0.366	
Ag	0.752	0.304	0.118	0.267	0.389	~0.003	0.017	<0.003	~0.009	0.195	
Cd	0.295	0.090	0.017	0.079	0.060	0.060	0.030	0.083	0.043	0.120	
Hg	0.014	0.010	0.009	0.018	0.016	0.007	~0.006	0.009	~0.006	0.018	
Pb	0.023	0.033	0.086	0.125	0.097	0.090	0.030	0.216	0.069	0.057	

' ~ ' indicates the measured value was above LoD but below LoQ

FERA sample No.	21178	21179	21183	21184	21185	21186	21187	21188	21200	21201
FERA LIMS code	S13-000947	S13-000948	S13-001060	S13-001061	S13-001062	S13-001063	S13-001064	S13-001118	S13-001138	S13-001139
Sample Details	Common Mussels, Prod Area: Vaila Sound Linga, Site Name: Linga	Common Mussels, Prod Area: Gruting Voe Browland Voe, Site name: Browland Voe	Fresh Mussels, Prod Area: Dornoch Firth, Site Name: Miekle Ferry	Mussels, Prod Area: Loch Eishort, Site Name: Drunfearn	Common Mussels, Prod Area: South of Houss Holm	Mussels, Prod Area: North Uist 2, Site Name: Lochmaddy	Common Mussels, Prod Area: Loch Melfort, Site: Loch Melfort	Common Mussels, Prod Area: Glenuig Bay, Site Name: Glenuig Bay	Common Mussels, Prod Area: Clift Sound Stream Sound, Site Name: Stream Sound	Common Mussels, Prod Area: Clift Sound Whalwick, Site Name: Whalwick
mg/kg whole weight										
Cr	~0.07	~0.06	0.22	~0.06	~0.06	0.14	0.11	~0.09	~0.06	0.10
Mn	1.42	1.67	19.4	1.21	0.48	1.34	1.81	1.73	0.29	0.69
Co	0.013	0.013	0.061	0.023	0.014	0.024	0.022	0.023	0.014	0.017
Ni	~0.08	~0.09	0.20	~0.05	~0.07	0.11	~0.09	0.10	~0.07	0.10
Cu	0.56	0.35	0.62	0.57	0.41	0.37	0.77	0.74	0.74	1.00
Zn	11.2	13.3	6.17	7.82	10.8	9.74	7.87	9.43	12.9	12.2
As	0.94	1.02	1.51	1.28	1.15	2.91	1.49	1.54	0.98	1.19
Se	0.219	0.136	0.308	0.251	0.235	0.185	0.283	0.378	0.226	0.249
Ag	<0.003	<0.003	~0.006	~0.007	~0.004	<0.003	~0.004	0.012	<0.003	<0.003
Cd	0.069	0.084	0.089	0.064	0.097	0.086	0.066	0.075	0.051	0.060
Hg	~0.004	~0.005	0.017	0.008	~0.005	0.009	~0.006	0.007	~0.006	~0.006
Pb	0.101	0.081	0.136	0.044	0.087	0.192	0.074	0.078	0.115	0.107

' ~ ' indicates the measured value was above LoD but below LoQ

FERA sample No.	21205	21213	21235	21236	21237	21238	21239	21240	21241	21233
FERA LIMS code	S13-003272	S13-003776	S13-004096	S13-004097	S13-004098	S13-004099	S13-004100	S13-004101	S13-004102	S13-003917
Sample Details	Common Mussels, Prod Area: Gruting Voe, Site Name: Selivoe	Common Mussels, Prod Area: Basta Voe Cove, Site Name: Inner Site 2	Pacific Oysters, Prod Area: Kyle of Tongue, Site Name: Kyle of Tongue	Pacific Oysters, Prod Area: Loch Spelve: Croggan Pier, Site Name: Croggan Pier	Common Mussels, Prod Area: Loch Spelve: Inverlussa, Site Name: Site 1	Pacific Oysters, Prod Area: Loch Fyne: Ardkinglas, Site Name: The Point	Common Mussels, Prod Area: Loch Eil Fassfern, Site Name: Fassfern	Common Mussels, Prod Area: Vementry North, Site Name: Suthra Voe West	Common Mussels, Prod Area: Langsound, Site Name: Langsound	Common Mussels, Prod Area: Papa Little Voe, Site Name: Papa Little Voe
mg/kg whole weight										
Cr	~0.07	~0.07	0.18	~0.08	0.12	~0.06	0.20	~0.06	0.10	~0.08
Mn	0.94	0.49	2.45	2.74	1.92	3.22	4.46	0.42	0.59	0.72
Co	0.015	0.015	0.030	0.025	0.029	0.022	0.032	0.012	0.021	0.018
Ni	~0.07	~0.06	~0.09	~0.03	~0.08	~0.06	0.22	~0.04	~0.06	~0.09
Cu	0.63	0.69	5.67	9.17	0.72	6.15	1.13	0.34	0.91	0.69
Zn	15.2	12.6	134	607	8.20	112	11.1	10.1	15.4	13.9
As	1.16	1.10	1.67	1.98	1.40	1.06	1.52	0.82	1.46	1.32
Se	0.210	0.205	0.208	0.254	0.324	0.128	0.351	0.147	0.258	0.275
Ag	<0.003	<0.003	0.262	0.614	~0.007	0.486	~0.008	~0.005	<0.003	~0.003
Cd	0.080	0.122	0.199	0.298	0.055	0.210	0.060	0.091	0.052	0.171
Hg	~0.005	~0.005	0.011	0.014	0.010	0.010	0.012	~0.004	0.008	~0.004
Pb	0.107	0.069	0.050	0.065	0.080	0.028	0.080	0.053	0.178	0.079

' ~ ' indicates the measured value was above LoD but below LoQ

FERA sample No.	21234	21242	21243	21248	21249	21251	21252	21253	21254	21255
FERA LIMS code	S13-003918	S13-004378	S13-004379	S13-004621	S13-004622	S13-004706	S13-004726	S13-004727	S13-004728	S13-004765
Sample Details	Common Mussels, Prod Area: Loch Erisort, Site Name: Garbh Eilean	Common Cockles, Prod Area: Loch Na Cille, Site Name: Loch Na Cille Cockles	Common Mussels, Prod Area: East Firth, Site Name: Site 1	Pacific Oyster Otter Ferry	Common Mussels Weisdale Voe N Flotta	Razor; Production area: North Bay; Site name: Barassie	Common mussel; Prod area: loch Roag Miavaig; Site name: Miauaig	Common mussel; Prod area: loch Roag Barraglom; Site name: loch Barraglom	Common mussel; Prod area: loch Roag Torranish; Site name: loch Torranish	Dredged wedge clams, production area and site name: Stevenston sands
mg/kg whole weight										
Cr	0.23	0.23	~0.07	~0.04	~0.09	0.26	0.17	0.16	0.12	1.56
Mn	2.25	1.94	0.59	3.47	0.57	1.90	0.97	1.18	1.15	10.42
Co	0.040	0.167	0.016	0.024	0.016	0.077	0.025	0.029	0.029	0.220
Ni	0.17	2.08	~0.07	~0.06	0.10	~0.09	0.16	0.13	0.12	1.18
Cu	0.54	0.53	0.58	9.84	0.60	1.02	0.64	0.85	0.90	2.96
Zn	8.72	4.63	14.7	170	11.9	14.9	7.23	9.55	9.53	11.8
As	1.47	0.94	1.09	1.94	1.23	1.46	1.13	1.69	1.65	1.72
Se	0.310	0.162	0.191	0.153	0.216	0.179	0.249	0.406	0.349	0.402
Ag	~0.005	<0.003	<0.003	0.717	<0.003	0.218	~0.003	~0.005	~0.004	0.176
Cd	0.044	0.026	0.086	0.172	0.085	0.025	0.046	0.047	0.048	0.011
Hg	0.007	0.009	~0.004	0.013	~0.004	0.014	~0.005	0.009	0.007	0.015
Pb	0.115	0.082	0.102	0.038	0.084	0.056	0.106	0.111	0.106	0.770

' ~ ' indicates the measured value was above LoD but below LoQ

FERA sample No.	21267	21268	21273	21274	21275	21341		
FERA LIMS code	S13-005066	S13-005067	S13-005206	S13-005207	S13-005208	S13-023932		
Sample Details	Pacific oyster, Loch Kishorn North oysters	Pacific oyster, Loch Creran Upper oysters	Queen scallops, Loch Fyne, Stonefields, North Bay	Common mussel, Loch Leven Upper	Pacific oyster, Comarty Bay West	Razor Shells, Prod Area: Fersness Bay, Site Name: Fersness Razors		
							Sample LoD	Sample LoQ
mg/kg whole weight								
Cr	0.25	<0.03	0.13	~0.08	~0.08	0.22	0.03	0.1
Mn	2.58	2.18	24.4	3.53	1.30	0.82	0.01	0.03
Co	0.030	0.013	0.066	0.023	0.019	0.056	0.002	0.01
Ni	0.15	<0.03	0.10	~0.08	0.10	0.17	0.03	0.1
Cu	8.58	6.69	2.41	0.52	12.12	1.18	0.03	0.1
Zn	137	85.5	37.3	5.05	140	13.5	0.05	0.17
As	1.40	0.99	1.73	1.36	1.18	1.56	0.02	0.07
Se	0.137	0.153	0.643	0.282	0.172	0.265	0.005	0.02
Ag	0.363	0.267	1.08	~0.009	0.584	0.042	0.003	0.01
Cd	0.158	0.123	0.478	0.060	0.114	0.150	0.002	0.007
Hg	0.016	~0.006	0.017	0.013	0.014	0.016	0.002	0.007
Pb	0.053	0.026	0.178	0.056	0.054	0.037	0.002	0.007

' ~ ' indicates the measured value was above LoD but below LoQ

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