The role of the expert laboratories

Heidelore Fiedler
Örebro University, School of Science and Technology
MTM Research Centre
Se-702 84 Örebro, Sweden
E-mail: heidelore.fiedler@oru.se
Contents

• Identity of technical capacity assistance
• Interlaboratory assessment
• Laboratory training
• Ambient air with PAS/PUFs
• Human milk
• Surface water
• National samples
Role of expert laboratories

- Technical advice
- Interlaboratory assessments
- Training, mirror analysis
- Communication
## Expert laboratories for global assistance in GMP projects

<table>
<thead>
<tr>
<th>CVUA (Germany)</th>
<th>MTM (Sweden)</th>
<th>IVM VU (Netherlands)</th>
<th>Recetox (Czech R)</th>
<th>CSIC (Spain)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human milk</td>
<td>dl-POPs, PFOS</td>
<td>OCPs, PCB, BFR</td>
<td>PAS/PUFs preparation distribution</td>
<td>GRULAC</td>
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<tr>
<td></td>
<td>Water</td>
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</table>

HF Pacific Islands GMP2 Inception WS, April 2016
Recetox

Research Centre for Toxic Compounds in the Environment (Recetox)
Masaryk University, Brno, Czech Republic
Stockholm Convention Regional Centre in the Czech Republic (SCRC)

Kateřina Šebková, Director of the SCRC, sebkova@recetox.muni.cz

Stockholm Convention
Regional Centre for Capacity Building
and the Transfer of Technology
Interlaboratory assessment
Interlaboratory assessment: Set-up

• Coordinators:
  – Jacob de Boer, Ike van der Veen – IVM VU University
  – Heidi Fiedler – MTM Research Centre, Örebro University

• Content:
  – Invitations for registration open until 15 April 2016
  – Samples to be sent until mid July 2016 (from IVM VU University or MTM Research Centre)
  – Results due (in MsExcel sheet): not later than 9 September 2016

• Conditions:
  – Free of charge for laboratories from developing countries
Coordinators

Institute for Environmental Studies
VU University Amsterdam
The Netherlands
Dr. Jacob de Boer
http://www.ivm.vu.nl

Örebro University
School of Science and Technology
Man-Technology-Environment Research Centre (MTM)
Sweden
Dr. Heidi Fiedler

https://www.oru.se/english/research/research-environments/ent/mtm/research/?rdb=g203
https://www.oru.se/english/research/research-projects/rp/?rdb=p1639
## Test solutions and test samples

My laboratory is interested in analyzing the following matrices and POPs and provide the analytical results according to the reporting scheme and timetable (latest submission of results on 9 September 2016):

<table>
<thead>
<tr>
<th></th>
<th>OCP</th>
<th>PCB&lt;sub&gt;6&lt;/sub&gt;</th>
<th>PCDD/PCDF</th>
<th>dl-PCB</th>
<th>PBDE</th>
<th>HxBB</th>
<th>Toxaphene</th>
<th>HBCD</th>
<th>PFAS</th>
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<tr>
<td><strong>Standard solution</strong></td>
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<td>Fish</td>
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<tr>
<td>Human milk</td>
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<tr>
<td>Air extract</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Human blood</td>
<td>PFOS</td>
<td>PFAS</td>
<td></td>
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<tr>
<td>Water</td>
<td>PFOS</td>
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</tr>
</tbody>
</table>

### Analysis of POPs

- **OCP**
- **PCB<sub>6</sub>**
- **PCDD/PCDF**
- **dl-PCB**
- **PBDE**
- **HxBB**
- **Toxaphene**
- **HBCD**
- **PFAS**

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HF Pacific Islands GMP2 Inception WS, April 2016
Laboratory training
Analysis

Extraction

Analysis

Identification

Quantification

Courtesy, Jacob de Boer
Training

• On-site training (with view on future role in the GMP long-term):
  – needs-oriented
  – based on existing equipment

• Mirror analyses:
  – your choice

• Advise on laboratory infrastructure:
  – Provision of some consumables

• Background information, literature
More detailed laboratory assessment

• In English, French, and Spanish:

• Dialogue between to be trained laboratory and training laboratory.

• Here: MTM Örebro
MTM Research Centre, Örebro, Sweden

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### Check List

1. **GENERAL**

<table>
<thead>
<tr>
<th>Name of Laboratory:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Address of Laboratory:</td>
<td></td>
</tr>
<tr>
<td>E-mail:</td>
<td></td>
</tr>
<tr>
<td>Phone:</td>
<td></td>
</tr>
<tr>
<td>WebPage:</td>
<td></td>
</tr>
<tr>
<td>Contact person:</td>
<td></td>
</tr>
</tbody>
</table>

2. **TECHNICAL PART - EXISTING CAPACITY TO ANALYZE POPs**

2.1 Description of the Laboratory:
Provision of spares and consumables

- Tailored according to needs (determined by analytes and equipment);
- Chemical analytical standards for:
  - GC/ECD laboratories + OCPs/PCB$_6$/HxBB
  - GC/(LR or HR)MS laboratories + chlorinated/brominated POPs
  - (HP or UP)LC/MS-MS or TOF laboratories + PFAS
- Analytical columns (including ferrules, liners, syringes):
  - PCB column; dl-POPs
  - LC column
- Other
Ambient air sampling
PAS/PUFs
Important facts

- Passive air samplers (PAS) provided to all countries (from Recetox)
- PAS equipped with PUFs (polyurethane foam disks) to capture POPs from air
- 2 years of sampling: each sampling period for 3 months → 8 samplings
- Sampling starts on 1 July 2016
Analytical laboratories

IVM VU University
For:
• OCPs
• PCB₆
• PBDE, HxBB, HBCD

MTM Research Centre
For:
• dl-POPs (PCDD, PCDF, dl-PCB)
• PFOS and precursors

USP/IAS: National samples for OCPs, PCB₆ and PFOS and precursors
## Ambient air sampling: Set-up

- Recetox (CZR) will ship to each country:
  - Passive air samplers (PAS) and 10 pre-cleaned PUFs per sampler

<table>
<thead>
<tr>
<th>PAS No.</th>
<th>Pre-cleaned with</th>
<th>Analysis for</th>
<th>Analysed by</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAS-1</td>
<td>dichloromethane</td>
<td>OCPs</td>
<td>IVM VU</td>
<td>5x9 PAS</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>= 45 PAS for 9 countries; 450 PUFs</td>
</tr>
<tr>
<td>PAS-3</td>
<td>dichloromethane</td>
<td>PCB₆</td>
<td>IVM VU</td>
<td></td>
</tr>
<tr>
<td>PAS-5</td>
<td>toluene</td>
<td>dl-POPs</td>
<td>MTM</td>
<td></td>
</tr>
<tr>
<td>PAS-9</td>
<td>dichloromethane</td>
<td>PBDE, HxBB, HBCD</td>
<td>IVM VU</td>
<td></td>
</tr>
<tr>
<td>PAS-11</td>
<td>methanol</td>
<td>PFOS</td>
<td>MTM</td>
<td></td>
</tr>
<tr>
<td>PAS-2</td>
<td>dichloromethane</td>
<td>OCPs</td>
<td>USP/IAS</td>
<td>3 PAS in Fiji</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>= 30 PUFs</td>
</tr>
<tr>
<td>PAS-4</td>
<td>dichloromethane</td>
<td>PCB₆</td>
<td>USP/IAS</td>
<td></td>
</tr>
<tr>
<td>PAS 12</td>
<td>methanol</td>
<td>PFOS</td>
<td>USP/IAS</td>
<td></td>
</tr>
</tbody>
</table>

Project has up to 58 PAS \(\Rightarrow\) 10 PAS to be placed in other countries \(\Rightarrow\) national analysis (includes UQ)
Nomenclature for PAS and PUFs

Country: Full country name and ISO-3 code
Sampler (PAS)-ID = name plate on the sampler: ISO-3 – PAS#;
Example: FJI-1

Time code is as follows:
   i. Year in Arabic numbers (2016, 2017, 2018)
   ii. Seasons are assigned in Roman numbers
      I  Jan-Mar
      II Apr-Jun
      III Jul-Sep
      IV Oct-Dec

Laboratory that receives the PUF for analysis (IVM or MTM)
Lab analysis code Example: SLB-7 (2017-II) (IVM)

Results code: KIR-11 (2018-I)
Kiribati: result for PFOS for period 1 Jan to 31 Mar 2018

Last sample will be: KIR-11 (2018-II)
<table>
<thead>
<tr>
<th>Country (full name)</th>
<th>ISO_3</th>
<th>Sampler/ PAS no</th>
<th>Sampler- ID</th>
<th>PUF cleaning solvent 1</th>
<th>PUF cleaning solvent 2</th>
<th>Year</th>
<th>Season</th>
<th>Time code</th>
<th>Sampling code</th>
<th>Analytes</th>
<th>Laboratory</th>
<th>Lab analysis code</th>
<th>Results code</th>
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</thead>
<tbody>
<tr>
<td>Fiji</td>
<td>FJI-1</td>
<td>1</td>
<td>FJI-1</td>
<td>acetone</td>
<td>dichloromethane</td>
<td>2016</td>
<td>IV</td>
<td>2016-II</td>
<td>FJI-1 (2016-II)</td>
<td>OCPS</td>
<td>IVM</td>
<td>FJI-1 (2016-II) (IVM)</td>
<td>Fiji (2016-II)</td>
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<td>Fiji</td>
<td>FJI-1</td>
<td>1</td>
<td>FJI-1</td>
<td>acetone</td>
<td>dichloromethane</td>
<td>2017</td>
<td>I</td>
<td>2017-III</td>
<td>FJI-1 (2017-III)</td>
<td>OCPS</td>
<td>IVM</td>
<td>FJI-1 (2017-III) (IVM)</td>
<td>Fiji (2017-III)</td>
</tr>
<tr>
<td>Fiji</td>
<td>FJI-1</td>
<td>1</td>
<td>FJI-1</td>
<td>acetone</td>
<td>dichloromethane</td>
<td>2017</td>
<td>II</td>
<td>2017-IV</td>
<td>FJI-1 (2017-IV)</td>
<td>OCPS</td>
<td>IVM</td>
<td>FJI-1 (2017-IV) (IVM)</td>
<td>Fiji (2017-IV)</td>
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<td>Fiji</td>
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<td>FJI-1</td>
<td>acetone</td>
<td>dichloromethane</td>
<td>2017</td>
<td>III</td>
<td>2017-I</td>
<td>FJI-1 (2017-I)</td>
<td>OCPS</td>
<td>IVM</td>
<td>FJI-1 (2017-I) (IVM)</td>
<td>Fiji (2017-I)</td>
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<td>1</td>
<td>FJI-1</td>
<td>acetone</td>
<td>dichloromethane</td>
<td>2017</td>
<td>IV</td>
<td>2017-IV</td>
<td>FJI-1 (2017-IV)</td>
<td>OCPS</td>
<td>IVM</td>
<td>FJI-1 (2017-IV) (IVM)</td>
<td>Fiji (2017-IV)</td>
</tr>
</tbody>
</table>

**Set-up of PAS and exchange of PUFs**

(1) HF Pacific Islands GMP2 Inception WS, April 2016
## Set-up of PAS and exchange of PUFs (2)

<table>
<thead>
<tr>
<th>ISO_3</th>
<th>PAS site name</th>
<th>GPS coordinates of site</th>
<th>Year</th>
<th>Season</th>
<th>Time code</th>
<th>Average Temp. (°C)</th>
<th>Name of person who deployed the PUF</th>
<th>Actual exposure start</th>
<th>Actual exposure end</th>
<th>Name of person who collected the PUF</th>
<th>Effective days of Stored at (place)</th>
<th>Shipped for analysis</th>
</tr>
</thead>
</table>
PAS/PUFs: Actions to be taken by each country

- Identify “air coordinator”
  - Send address details for correspondence and shipment

- Air coordinator
  - Identify site for air sampling and send GIS coordinates and street address
  - Upon contact from Recetox, agree on shipment/delivery date;
  - Secure site and place samplers to start sampling on 1 July 2016;
  - Take a photo of the samplers and a photo from the air coordinator (with samplers);
  - Fill out the MsExcel form to record activities at the national site;
  - Exchange PUFs and ship to laboratory as appropriate (see time table of workplan);

Send all information to UNEP (Jacqueline) and MTM (Heidi)
Recetox will ship PAS and PUFs
## Georeferences – PAS sites

<table>
<thead>
<tr>
<th>No.</th>
<th>Country name</th>
<th>ISO_3</th>
<th>Site</th>
<th>Type</th>
<th>Altitude (m)</th>
<th>Latitude (deg)</th>
<th>Longitude (deg)</th>
<th>Latitude (decimal)</th>
<th>Longitude (decimal)</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Fiji</td>
<td>FJI-SUV</td>
<td>Suva</td>
<td>urban-industrial</td>
<td>13 (6)</td>
<td>18° 08’ S</td>
<td>178° 27’ E</td>
<td>-18.0333</td>
<td>178.55</td>
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<td></td>
<td>Fiji</td>
<td>FJI-NSR</td>
<td>Nausori</td>
<td>rural</td>
<td>7 (30)</td>
<td>18° 02’ S</td>
<td>178° 33’ E</td>
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<td>178.5474</td>
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<td>Fiji</td>
<td>FJI-NAN</td>
<td>Nadi</td>
<td>urban-industrial</td>
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<td>17° 45’ S</td>
<td>177° 27’ E</td>
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<td>KIR-BET</td>
<td>Betio</td>
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<td>01° 21’ N</td>
<td>172° 56’ E</td>
<td>1.35</td>
<td>172.9333</td>
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<td></td>
<td>Kiribati</td>
<td>KIR-BEZ</td>
<td>Beru</td>
<td>rural</td>
<td>xx (2)</td>
<td>01° 21’ S</td>
<td>175° 59’ E</td>
<td>-1.35</td>
<td>175.9833</td>
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<td>7° 05N</td>
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<td>171.3833</td>
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<td>4</td>
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<td>NIU</td>
<td>Alofi</td>
<td>urban</td>
<td>65 (59)</td>
<td>19° 04’ S</td>
<td>169° 55’ W</td>
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<td>-169.9167</td>
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<tr>
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<td>Palau</td>
<td>PLW</td>
<td>Koror1</td>
<td>urban</td>
<td>30</td>
<td>7° 21 N</td>
<td>134° 28 E</td>
<td>7.3333</td>
<td>134.4667</td>
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<td>6</td>
<td>Samoa</td>
<td>WSM</td>
<td>Apia1</td>
<td>urban</td>
<td>9</td>
<td>13° 50 S</td>
<td>171° 45 W</td>
<td>-13.8333</td>
<td>-171.7400</td>
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<td>Solomon Islands</td>
<td>SLB-HNR</td>
<td>Honiara</td>
<td>urban</td>
<td>xx (55)</td>
<td>09° 25’ S</td>
<td>159° 58’ E</td>
<td>-9.4167</td>
<td>159.9667</td>
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<td></td>
<td>Solomon Islands</td>
<td>SLB-MD</td>
<td>Munda</td>
<td>rural</td>
<td>xx (4)</td>
<td>08° 20’ S</td>
<td>157° 15’ E</td>
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<td>TUV</td>
<td>Funafuti</td>
<td>urban</td>
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<td>VUT</td>
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</tbody>
</table>

Altitude: numbers are from Google Earth  
numbers in parenthesis are from national reports
Proposed PAS/PUF sampling scheme

<table>
<thead>
<tr>
<th>Assignment of samplers, PUFs, and analytes according to laboratory per country</th>
<th>No. analyses per year</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sampler 1:</strong> PUFs 1-4: For basic POPs pesticides in expert back-up laboratory</td>
<td>4</td>
</tr>
<tr>
<td>drns, chlordane, DDTs, HCHs, heptachlor, mirex, HCB, pentachlorobenzene, endosulfans, toxaphenes, chlordecone</td>
<td>toxaphene, annual sample only</td>
</tr>
<tr>
<td><strong>Sampler 2:</strong> PUFs 1-4: For basic POPs in national POPs laboratory</td>
<td>4</td>
</tr>
<tr>
<td>drns, chlordane, DDTs, HCHs, heptachlor, mirex, HCB, pentachlorobenzene, endosulfans, toxaphenes, chlordecone</td>
<td>toxaphene, annual sample only</td>
</tr>
<tr>
<td><strong>Sampler 3:</strong> PUFs 1-4: For indicator PCB in expert back-up laboratory</td>
<td>4</td>
</tr>
<tr>
<td>6 indicator PCB</td>
<td></td>
</tr>
<tr>
<td><strong>Sampler 4:</strong> PUFs 1-4: For indicator PCB in national POPs laboratory</td>
<td>4</td>
</tr>
<tr>
<td>6 indicator PCB</td>
<td></td>
</tr>
<tr>
<td><strong>Sampler 5:</strong> PUFs 1-4: For dioxin-like POPs in expert back-up laboratory (combined into one extract as annual average)</td>
<td>1</td>
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<tr>
<td>17 PCDD/PCDF, 12 dl-PCB</td>
<td></td>
</tr>
<tr>
<td><strong>Sampler 6:</strong> PUFs 1-4: For dioxin-like POPs in national dioxin laboratory (combined into one extract as annual average)</td>
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<tr>
<td>17 PCDD/PCDF, 12 dl-PCB</td>
<td></td>
</tr>
<tr>
<td><strong>Sampler 7:</strong> PUFs 1-4: For dioxin-like POPs in expert back-up laboratory (each exposure to generate one seasonal data point; total of 4 per year and country)</td>
<td>4</td>
</tr>
<tr>
<td>17 PCDD/PCDF, 12 dl-PCB</td>
<td></td>
</tr>
<tr>
<td><strong>Sampler 8:</strong> PUFs 1-4: For dioxin-like POPs in national laboratory (each exposure to generate one seasonal data point; total of 4 per year and country)</td>
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</tr>
<tr>
<td>17 PCDD/PCDF, 12 dl-PCB</td>
<td></td>
</tr>
<tr>
<td><strong>Sampler 9:</strong> PUFs 1-4: For PBDE in expert laboratory</td>
<td>4</td>
</tr>
<tr>
<td>8 PBDE, HBCD, PBB</td>
<td></td>
</tr>
<tr>
<td><strong>Sampler 10:</strong> PUFs 1-4: For PBDE in national laboratory</td>
<td>4</td>
</tr>
<tr>
<td>8 PBDE, HBCD, PBB</td>
<td></td>
</tr>
<tr>
<td><strong>Sampler 11:</strong> PUFs 1-4: For PFOS in expert laboratory</td>
<td>4</td>
</tr>
<tr>
<td>6 PFAS</td>
<td></td>
</tr>
<tr>
<td><strong>Sampler 12:</strong> PUFs 1-4: For PFOS in national laboratory</td>
<td>4</td>
</tr>
<tr>
<td>6 PFAS</td>
<td></td>
</tr>
</tbody>
</table>

Color codes:
- **Green**: Analysis in expert back-up laboratory
- **No Fill**: Analysis in national laboratory
- **Yellow**: Groups of chemicals recommended for analysis
PFOS-related compounds (precursors)

- N-methyl perfluorooctane sulfonamide (MeFOSA)
- N-ethyl perfluorooctane sulphonamide (EtFOSA)
- N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)
- N-ethyl perfluorooctane sulfonamidoethanol (EtFOSE)
- Perfluorooctanesulfonamide (FOSA)
Ambient air samples (PUFs) – Analysis expert labs

By IVM VU University

• PAS 1:
  – 8 quarterly samples analyzed for: aldrin, endrin, dieldrin, chlordanes, DDTs, HCHs, heptachlors, mirex, HCB, pentachlorobenzene, endosulfans, chlordecone
  – 2 annual samples for toxaphene

• PAS 3: 8 quarterly samples analyzed for 6 indicator PCB (PCB₆)
• PAS 7: 8 quarterly samples analyzed for 8 PBDE and HxBB (and 3 HBCD isomers)

By MTM Centre Örebro University

• PAS 5: 2 annual to be analysed for 17 PCDD/PCDF and 12 dl-PCB (dl-POPs)
• PAS 11: 8 quarterly samples to be analyzed for PFOS and 5 precursors
Ambient air samples (PUFs) – Analysis national lab(s)

By USP/IAS University (preliminary plan)

• PAS 2:
  – 8 quarterly samples analyzed for: aldrin, endrin, dieldrin, chlordanes, DDTs, HCHs, heptachlors, mirex, HCB, pentachlorobenzene, endosulfans, chlordecone, and HxBB (since no PAS 8)

• PAS 4: 8 quarterly samples analyzed for 6 indicator PCB (PCB₆)

• PAS 12: 8 quarterly samples to be analyzed for PFOS and 5 precursors

• Not used: PAS 7 since no national dioxin laboratory for mirror analysis since no national laboratory: PAS 6 and PAS 8 (dl-POPs)
PAS 10 (PBDE, HBCD)
Human milk
CVUA Freiburg
(State Institute for Chemical and Veterinary Analysis of Food)

WHO/UNEP Reference Laboratory for dioxins, PCBs and halogenated pesticides (POP) in human milk

EU Reference Laboratory (EU-RL) for dioxins and PCBs in feed and food

EU-RL for pesticides in food of animal origin and commodities with high fat content
UNEP/WHO Reference Laboratories for POPs in Human Milk at CVUA Freiburg and Örebro University
Mothers’ milk for exposure monitoring

UNEP-coordinated Survey of Mothers’ Milk for Persistent Organic Pollutants

Guidelines for Organization, Sampling and Analysis

Chemicals Branch
United Nations Environment Programme (UNEP)
July 2012

Requested amounts:
- Minimum: 50 ml/mother;
- Pooled sample: 1250 ml

Prepared by: Dr. Karin Malisch and Dr. Heidelore Fiedler
Sample preparation scheme (1)

Collection of 50 individual samples
- Preparation of
  - individual samples for analysis of basic POPs by country
  - pooled (mixed) samples (analysis by Reference Laboratory CVUA)

1. Collection of 50 individual samples of 50 ml each.
   Options for the collection of the individual samples:
   - if possible, in one collection, or
   - in portions over time (e.g. on several days), with preservation of the collected portions by freezing

2. These 50 ml have to be split into two portions of 25 ml each:
Sample preparation scheme (2)

Preparation of individual samples for analysis of basic POPs by country and of pooled (mixed) samples

- Take 25 ml into 2000 ml bottle (50 * 25 ml ea = 1250 ml)

  Send the 2000 ml bottle with frozen pooled samples to WHO/UNEP Reference Lab

- Individual samples for analysis by country for basic POPs

For (deep-frozen) storage in and analysis by country. If no analysis in country possible and no storage capacity available, contact UNEP.
Stabilization of human milk samples with dichromate

• If refrigeration not available: Addition of dichromate to milk: 0.1 %:
  – 140 mg potassium dichromate, containing about 100 mg dichromate, to 100 ml milk;
  – absolute accuracy is not important: finally an excess of dichromate in milk (visible as yellow colour) which will be reduced to (green) Cr (III) before analysis.

0.1 % is equivalent to 3 tablets (= 100 mg dichromate) per 100 ml sample
CVUA (through contract with UNEP) will do:

1. Preparation (cleaning) and shipment of glassware containers to countries: 50 x 100 ml
   1 x 2 l

2. Analysis of human milk pools for chlorinated and brominated POPs;

3. Ship aliquots to MTM Örebro for analysis of PFOS;

4. Report results back to the countries and UNEP

Contact: Dr. Karin Malisch
karin.malisch@cvuafr.bwl.de
QUESTIONNAIRE FOR POTENTIAL HUMAN MILK DONORS

WHO/UNEP-coordinated Survey of Human Milk for Persistent Organic Pollutants

CONFIDENTIAL!

Section 1: Personal Information

Name
Phone number

Today's Date
(dd/mm/yyyy)

Address
e-mail

Individual Identification Code
Pool Identification Code

Based on established criteria, is the participant eligible?

Yes ☐
No ☐

What is the status of donor in regard to the survey?

Selected ☐
Reserve ☐
Not Selected ☐

If this mother has been pre-selected to donate a sample (or is designated as an alternate), the top of Section 4 should be completed and detached from this questionnaire. Section 4 should be sent to the clinic to be completed at the time of sample collection.

6 ANNEX 6: MODEL INFORMED CONSENT FORM

Certificate of Consent

I have been invited to take part in the research on UNEP Global Survey of Human Milk for Persistent Organic Pollutants (POPs). I have been told the purpose and procedures of this survey, in summary:

Purpose of the survey
Official letters to facilitate custom clearance
Human milk: Actions to be taken by each country

• Identify "human milk coordinator"
  – Send address details for correspondence and shipment

• Human milk coordinator
  – Initiate process for ethical clearance to collect human samples nationally;
  – Upon contact from CVUA, agree on shipment/delivery date of glass ware;
  – Prepare national protocol for human milk sampling;
  – Prepare the national pool or keep individual samples separate;
  – Ship human milk sample to CVUA (receive shipment number and agree on dates, custom’s clearance);

Send all information to UNEP (Jacqueline) and CVUA (Rainer Malisch) copy to MTM (Heidi)
Packaging and shipment
Surface water

L-PFOS
linear

C$_8$F$_{17}$SO$_3$H isomers

4-PFOS

3,5-PFOS
branched
Set-up

• All water samples will be analysed by MTM Research Centre, Örebro University, Sweden;

• MTM Centre will:
  – Provide containers for sampling of surface water (500 mL) and instructions
  – 8 samples (several dippings) to be taken for one sample
  – Analyse the water samples for L-PFOS and total PFOS
PFOS water guide

- Estuaries are recommended as sampling sites, but data from other sites are welcome and should have one of the following characteristics:
  - Estuary and larger tidal rivers and bays
  - River downstream populated area (distant from any influent)
  - Lake with a defined surrounding population
  - Tributary (before entering the main stream)

- Adapt the distance to shore to existing circumstances at the site. Make sure the water sampled is from a zone where it is mixed.

- Sample at a selected site 4 times a year (same site and with the same method);

- Carefully determine the sampling occasions depending on optimal conditions, preferably consistent between years, e.g.:
  - 2 times high-water stage and
  - 2-timed low-water stage,
  - Although avoiding drought conditions or freezing conditions
4. Minimum data to report

- Site ID code
- Location name
- Date
- Names of personnel conducting the sampling
- GPS coordinates of sampling site
- Marine/fresh water
- Distance to shore
- Water depth
- Sampling depth
- Total suspended solid (TSS)
- Conductivity

National samples

1. Mirror samples
2. Additional data from countries
Samples of national interest

• Samples other than the core matrices
  – recommended are: fish, sediment, foodstuffs (fatty)

• To be analysed for the four (chemical) groups of POPs
  – by IVM VU University: OCPs/PCB$_6$ (54 samples) or PBDE/HxBB (45 samples)
  – by MTM Örebro University: dl-POPs (36 samples) or PFOS (45 samples)

• Mirror analysis
  – National laboratory according to own capacities
OCPs in Fish in Africa

Courtesy Heather Leslie, IVM VU Amsterdam