SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

- **Trade name**: Constitutional BoBs (RUO)
- **Company product code**: 4500-0020 (packages P1 and P2)
- **Reach registration number**: N/A

1.2 Relevant identified uses of the substance or mixture and uses advised against

- **The uses of the chemical**: Constitutional BoBs is intended only for research use for the detection of abnormalities of DNA.
- **The chemical can be used by the general public**: No
- **The chemical is used by the general public only**: No

1.3 Details of the supplier of the safety data sheet

- **Manufacturer, importer, other undertaking**: PerkinElmer, Wallac Oy
- **Street address**: Mustionkatu 6
- **Postcode and post office**: FIN-20750 Turku
- **Post-office box**: PO Box 10
- **Postcode and post office**: FIN-20101 Turku
- **Telephone number**: +358-2-2678 111
- **Telefax**: +358-2-2678 357
- **E-mail address**: MSDS_Turku@perkinelmer.com, www.perkinelmer.com
- **Finnish Business ID (Y code)**: 0937168-4

1.4 Emergency telephone number

- **SAFETY**: +1-800-424-9300 (US)
- **+358-9-471 977**

SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

- **Hybridization buffer and Wash Buffer 1 may cause harm to (or damage) the unborn child, see enclosed MSDS**
- **Avoid exposure - obtain special instructions before use. Restricted to professional users.**

2.2 Label elements

- **Danger**

2.3 Other hazards

- **N/A**

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

### Hazardous ingredients

<table>
<thead>
<tr>
<th>CAS/EC number and the registration number</th>
<th>Name of the ingredient</th>
<th>Concentration</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>75-12-7</td>
<td>Formamide</td>
<td>See below</td>
<td>T, R 61, Repr. Cat. 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>GHS: Repr 1B, H360D, GHS08 Dgr</td>
</tr>
</tbody>
</table>

The product contains following components and hazardous chemicals as ingredients:

- Wash Buffer 1 ([75-12-7] Formamide 50%)
- Hybridization Buffer ([75-12-7] Formamide 50%)

**Note! These solutions may cause harm to (or damage) the unborn child, see enclosed MSDS**
• Random Primer Solution
• Biotin-dNTP Mix
• Polymerase
• Sample Diluent
• BACs-on-Beads Mix
• Reporter Concentrate
• Reporter Diluent
• Wash Buffer 2

The concentrations of hazardous chemicals in these other components are so low that the reagents are not classified as hazardous material

SECTION 4: FIRST AID MEASURES

4.1 Description of first aid measures
Wash with plenty of water.

4.2 Most important symptoms and effects, both acute and delayed
See enclosed MSDS for Wash Buffer 1 and Hybridization Buffer

4.3 Indication of any immediate medical attention and special treatment needed
If irritation occurs or if feeling unwell, seek medical advice

SECTION 5: FIREFIGHTING MEASURES

5.1 Extinguishing media
Water, appropriate foam, dry chemical or carbon dioxide

5.2 Special hazards arising from the substance or mixture
Emits toxic fumes and nitrogen oxides

5.3 Advice for firefighters
N/A

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Wear suitable protective clothes. Avoid contact, do not inhale vapours/aerosols.

6.2 Environmental precautions
See enclosed MSDS for Wash Buffer 1 and Hybridization Buffer

6.3 Methods and material for containment and cleaning up
Absorb on sand, paper, vermiculite or other appropriate material and place in a closed container for disposal. Ventilate and wash the area with water and detergent.

6.4 Reference to other sections
N/A

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling
Wear suitable protective clothes and gloves.

7.2 Conditions for safe storage, including any incompatibilities
Store package P1 at -30…-16°C and package P2 at +2…+8°C. The expiry date of the complete packages are stated on the outer labels.

7.3 Specific end use(s)
For Research Use Only. Not for use in diagnostic procedures.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

National occupational exposure limit values
see enclosed MSDS for Hybridization Buffer and Wash Buffer 1

Other limit values
see enclosed MSDS for Hybridization Buffer and Wash Buffer 1

DNEL
N/A

PNEC
N/A

8.2 Exposure controls

Appropriate engineering controls
Use good laboratory practices

Eye/face protection
At source of great extent of splashing use safety goggles
Trade name: Constitutional BoBs (RUO)

Date: 28.09.2011

Skin protection
Workwear

Hand protection
Disposable gloves. see enclosed MSDS for Hybridization Buffer and Wash Buffer 1

Respiratory protection
Not needed in laboratory scale. Filter A, if needed.

Thermal hazards
N/A

Environmental exposure controls
see enclosed MSDS for Hybridization Buffer and Wash Buffer 1

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Small vials, liquids.</td>
</tr>
<tr>
<td>Odour</td>
<td>N/A</td>
</tr>
<tr>
<td>Odour threshold</td>
<td>N/A</td>
</tr>
<tr>
<td>pH</td>
<td>N/A</td>
</tr>
<tr>
<td>Melting point/freezing point</td>
<td>N/A</td>
</tr>
<tr>
<td>Initial boiling point and boiling range</td>
<td>N/A</td>
</tr>
<tr>
<td>Flash point</td>
<td>N/A</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>N/A</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>N/A</td>
</tr>
<tr>
<td>Upper/lower flammability or explosive limits</td>
<td>N/A</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>N/A</td>
</tr>
<tr>
<td>Vapour density</td>
<td>N/A</td>
</tr>
<tr>
<td>Relative density</td>
<td>N/A</td>
</tr>
<tr>
<td>Solubility(ies)</td>
<td>Water</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water</td>
<td>N/A</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>N/A</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>N/A</td>
</tr>
<tr>
<td>Viscosity</td>
<td>N/A</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>N/A</td>
</tr>
<tr>
<td>Oxidising properties</td>
<td>N/A</td>
</tr>
</tbody>
</table>

9.2 Other information

N/A

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity

N/A

10.2 Chemical stability

N/A

10.3 Possibility of hazardous reactions

N/A

10.4 Conditions to avoid

N/A

10.5 Incompatible materials

N/A

10.6 Hazardous decomposition products

N/A
SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
see enclosed MSDS for Hybridization Buffer and Wash Buffer 1. The product is not fully tested

Skin corrosion/irritation
The components of this kit may irritate very sensitive persons

Serious eye damage/irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity
No data available

Reproductive toxicity
see enclosed MSDS for Hybridization Buffer and Wash Buffer 1

STOT-single exposure
No data available

STOT-repeated exposure
No data available

Aspiration hazard
No data available

Other information
May cause congenital malformations in the foetus. The components of this kit may irritate very sensitive persons

SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity
see enclosed MSDS for Hybridization Buffer and Wash Buffer 1

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
No data available

12.6 Other adverse effects
The product is not fully tested

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods
Disposal of all waste should be in accordance with local regulations. Hybridization Buffer and Wash Buffer 1 are classified as hazardous chemical waste.

SECTION 14: TRANSPORT INFORMATION

14.1 UN number
This product is not regulated under the transport regulations

14.2 UN proper shipping name
N/A

14.3 Transport hazard class(es)
N/A

14.4 Packing group
N/A

14.5 Environmental hazards
N/A
14.6 Special precautions for user
N/A

14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code
N/A

SECTION 15: REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
For research use only. Not for use in diagnostic procedures. Hybridization Buffer and Wash Buffer 1 are restricted to professional users.

15.2 Chemical safety assessment
N/A

SECTION 16: OTHER INFORMATION

Product has been labelled according to 98/79/EC
See instructions for use. This product should only be used by adequately trained personnel

The above information is believed to be correct, but does not purport to be all inclusive and shall be used only as a guide. Wallac shall not be held liable for any damage resulting from handling or from contact with the above
SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

Trade name
Hybridization Buffer and Wash Buffer 1 (Components of BoBs kit)

Company product code
N/A

Reach registration number
N/A

1.2 Relevant identified uses of the substance or mixture and uses advised against

The uses of the chemical
Components of a BoBs kit.

The chemical can be used by the general public

The chemical is used by the general public only

1.3 Details of the supplier of the safety data sheet

Manufacturer, importer, other undertaking
PerkinElmer, Wallac Oy

Street address
Mustionkatu 6

Postcode and post office
FIN-20750 Turku

Post-office box
PO Box 10

Postcode and post office
FIN-20101 Turku

Telephone number
+358-2-2678 111

Telefax
+358-2-2678 357

E-mail address
MSDS_Turku@perkinelmer.com
www.perkinelmer.com

Finnish Business ID (Y code)
0937168-4

1.4 Emergency telephone number

SAFETY: +1-800-424-9300 (US)
+358-9-471 977

SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

These solutions (Hybridization Buffer and Wash Buffer 1) may cause harm to (or damage) the unborn child. Avoid exposure - obtain special instructions before use. Restricted to professional users.

2.2 Label elements

Danger

2.3 Other hazards

N/A

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous ingredients

<table>
<thead>
<tr>
<th>CAS/EC number and the registration number</th>
<th>Name of the ingredient</th>
<th>Concentration</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>75-12-7</td>
<td>Formamide</td>
<td>40-60%</td>
<td>T, R 61, Repr. Cat. 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>GHS: Repr 1B, H360D, GHS08 Dgr</td>
</tr>
</tbody>
</table>

Other information

The solutions contain also other chemicals not classified as hazardous
### SECTION 4: FIRST AID MEASURES

<table>
<thead>
<tr>
<th>4.1</th>
<th><strong>Description of first aid measures</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Wash with plenty of water. If inhaled, remove to fresh air.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4.2</th>
<th><strong>Most important symptoms and effects, both acute and delayed</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>May irritate and may cause harm to (or damage) the unborn child.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4.3</th>
<th><strong>Indication of any immediate medical attention and special treatment needed</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>If irritation occurs or if feeling unwell or if you are pregnant, seek medical advice</td>
</tr>
</tbody>
</table>

### SECTION 5: FIREFIGHTING MEASURES

<table>
<thead>
<tr>
<th>5.1</th>
<th><strong>Extinguishing media</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Water, appropriate foam, dry chemical or carbon dioxide</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5.2</th>
<th><strong>Special hazards arising from the substance or mixture</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Emits toxic fumes and nitrogen oxides</td>
</tr>
</tbody>
</table>

### SECTION 6: ACCIDENTAL RELEASE MEASURES

<table>
<thead>
<tr>
<th>6.1</th>
<th><strong>Personal precautions, protective equipment and emergency procedures</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Wear suitable protective clothes. Avoid contact, do not inhale vapours/aerosols.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6.2</th>
<th><strong>Environmental precautions</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Do not allow run off to sewer, waterway or ground</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6.3</th>
<th><strong>Methods and material for containment and cleaning up</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Absorb on sand, paper, vermiculite or other appropriate material and place in a closed container for disposal. Ventilate and wash the area with water and detergent.</td>
</tr>
</tbody>
</table>

### SECTION 7: HANDLING AND STORAGE

<table>
<thead>
<tr>
<th>7.1</th>
<th><strong>Precautions for safe handling</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Wear suitable protective clothes, gloves and at source of great extent of splashing use safety goggles. Restricted to professional users.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>7.2</th>
<th><strong>Conditions for safe storage, including any incompatibilities</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Store at temperature specified on package. The expiry dates of the complete packages are stated on the outer labels. Accessible only for authorized persons</td>
</tr>
</tbody>
</table>

### SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

<table>
<thead>
<tr>
<th>8.2</th>
<th><strong>Control parameters</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>National occupational exposure limit values</td>
<td></td>
</tr>
<tr>
<td>10ppm (8h), 20ppm (15min), (2009) skin (formamide)</td>
<td></td>
</tr>
</tbody>
</table>

| Other limit values |
| 10ppm (8h), 20ppm (15min), (2009) skin (formamide) |

| DNEL |
| N/A |

| PNEC |
| N/A |

<table>
<thead>
<tr>
<th>8.2</th>
<th><strong>Exposure controls</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Appropriate engineering controls</td>
<td></td>
</tr>
<tr>
<td>Use good laboratory practices</td>
<td></td>
</tr>
</tbody>
</table>

| Eye/face protection |
| At source of great extent of splashing use safety goggles |

| Skin protection |
| Workwear |

| Hand protection |
| Disposable gloves, latex or nitrile |

| Respiratory protection |
| Not needed in laboratory scale. Filter A, if needed. |

| Thermal hazards |
| N/A |

| Environmental exposure controls |
| Do not allow run off to sewer, waterway or ground |
## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.3 Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Small vials, colourless liquids.</td>
</tr>
<tr>
<td>Odour</td>
<td>Slight odour of ammonia.</td>
</tr>
<tr>
<td>Odour threshold</td>
<td>N/A</td>
</tr>
<tr>
<td>pH</td>
<td>4-5</td>
</tr>
<tr>
<td>Melting point/freezing point</td>
<td>N/A</td>
</tr>
<tr>
<td>Initial boiling point and boiling range</td>
<td>N/A</td>
</tr>
<tr>
<td>Flash point</td>
<td>175°C (oc., formamide)</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>Henry’s Law constant: $H = 1.21 \times 10^{-9}$ atm m3/mol (formamide)</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>N/A</td>
</tr>
<tr>
<td>Upper/lower flammability or explosive limits</td>
<td>2.7 - 19.0 % (formamide)</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>0.08 hPa (formamide)</td>
</tr>
<tr>
<td>Vapour density</td>
<td>1.56 (formamide)</td>
</tr>
<tr>
<td>Relative density</td>
<td>ca. 1 g/cm³</td>
</tr>
<tr>
<td>Solubility(ies)</td>
<td>Water</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water</td>
<td>N/A</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>N/A</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>N/A</td>
</tr>
<tr>
<td>Viscosity</td>
<td>N/A</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>N/A</td>
</tr>
<tr>
<td>Oxidising properties</td>
<td>N/A</td>
</tr>
</tbody>
</table>

9.4 Other information

N/A

## SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity

N/A

10.2 Chemical stability

N/A

10.3 Possibility of hazardous reactions

N/A

10.4 Conditions to avoid

N/A

10.5 Incompatible materials

Iodine, pyridine, sulphur trioxide, oxidizing agents

10.6 Hazardous decomposition products

Carbon and nitrogen oxides

## SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LD₅₀  6000 mg/kg (rat, oral) (formamide)
LD₅₀  3500 mg/kg (mouse, oral) (formamide)

The product is not fully tested
Trade name: Hybridization Buffer and Wash Buffer 1

Date: 28.09.2011

Skin corrosion/irritation
The solutions may irritate very sensitive persons

Serious eye damage/irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Reproductive toxicity
May cause congenital malformations in the foetus

STOT-single exposure
No data available

STOT-repeated exposure
No data available

Aspiration hazard
No data available

Other information
May cause congenital malformations in the foetus. The solutions may irritate very sensitive persons

SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity
   \[ LC_{50} = 4600 – 9300 \text{ mg/l/96h (L.idus, DIN 38412)} \text{ (formamide)} \]
   \[ EC_{50} = >500 \text{ mg/l/48h (Daphnia)} \text{ (formamide)} \]
   \[ IC_{50} = >500 \text{ mg/l/72h (Algae)} \text{ (formamide)} \]
   \[ EC_{50} = >10 \text{ g/l/17h (Pseudomonas putida)} \text{ (formamide)} \]

12.2 Persistence and degradability
   \[ >30%/14d \text{ (MITI test)} \text{ (formamide)} \]
   \[ >70%/28d \text{ (OECD 302B)} \text{ (formamide)} \]

12.3 Bioaccumulative potential
   no bioaccumulation, \[ \log Pow -0.82 \text{ (OECD 107)} \text{ (formamide)} \]

12.4 Mobility in soil
   No data available, \[ \log Koc 1.101 \text{ (IUCLID)} \text{ (formamide)} \]

12.5 Results of PBT and vPvB assessment
   No data available

12.6 Other adverse effects
   The product is not fully tested

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods
   Disposal of all waste should be in accordance with local regulations. The solutions are classified as hazardous chemical waste.

SECTION 14: TRANSPORT INFORMATION

14.1 UN number
   This product is not regulated under the transport regulations

14.2 UN proper shipping name
   N/A

14.3 Transport hazard class(es)
   N/A

14.4 Packing group
   N/A

14.5 Environmental hazards
   N/A

14.6 Special precautions for user
   N/A
14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code
N/A

SECTION 15: REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
The solutions are restricted to professional users.

15.2 Chemical safety assessment
N/A

SECTION 16: OTHER INFORMATION

See instructions for use. This product should only be used by adequately trained personnel

The above information is believed to be correct, but does not purport to be all inclusive and shall be used only as a guide. Wallac shall not be held liable for any damage resulting from handling or from contact with the above