A. GENERAL INFORMATION:

1. Spill incident Number: 635318

2. Name of Location: OPUKUSHI FLOW STATION

3. Name of nearest community: AGBIDIAMA AND EGBEMOR-ANGALABIRI

4. State: BAYELSA

   LGA: EKEREMOR

   WELL 34 TANGO 4-INCH FLOWLINE

   Asset owner /District: U1G/P/NWS2

5. Type of Production facility/Installation

B. INCIDENT INFORMATION:

6. Details of incident

   a. Date of incident: 15TH MARCH, 2011

   b. Date/Period of investigation: 18TH MARCH, 2011

   c. Description of spill point environment:

      - Firmed soil: [Y] [N]
      - Loose soil: [Y] [N]
      - Previously excavated area: [Y] [N]
      - Under water: [Y] [N]
      - Swampy: [Y] [N]
      - Exposed pipe surface: [Y] [N]

   d. Description of leak point (tick as applicable):

      - Drilled hole: [Y] [N]
      - Hack saw cut: [Y] [N]
      - Explosive tear: [Y] [N]
      - Complete Rupture: [Y] [N]
      - Inward dent: [Y] [N]
      - Well head tampering: [Y] [N]
      - Failed Weld-on illegal hot tap valve: [Y] [N]
      - Missing pipeline (flowline): [Y] [N]
      - Crude oil theft (illegal bunkering) point: [Y] [N]
      - Third party tampering with Clamp Bolt/Nut: [Y] [N]
      - Third party tampering with valve setting: [Y] [N]
      - Third party tampering with flange Nuts/bolts: [Y] [N]
      - Corrosion: [Y] [N]

         Type: Pitting

         - Saver-pit over flow: [Y] [N]
         - Surge vessel overflow: [Y] [N]
         - Outward dent: [Y] [N]
         - Others (specify): Laceration on pipe

   e. Spill point coordinates

      Northing: 100892m
      Easting: 374326m
C. RISK/DAMAGE ASSESSMENT

7. Type of environment of spill site:
   - [ ] Land
   - [ ] Swamp
   - [x] Tidal
   - [ ] Water

   Type of environment of which oil has spread:
   - [ ] Land
   - [ ] Swamp
   - [x] Water

8. Distance from the nearest sensitive habitat
   - [ ] Government reserved and designated protected area
   - [ ] Drinking water source
   - [ ] Built up area
   - [ ] Farmlands
   - [ ] Fish Farm/Pond
   - [ ] Fishing net
   - [ ] Others (specify)
   - [ ] NOT APPLICABLE

9. Containment measures put in place:
   - [x] Booms
   - [Y] Trench
   - [Y] Dyke
   - [ ] Others:

10. Any pictures or video coverage?
    - [x] [N]

11. Was there any disruption to the investigation?
    - [Y] [N]

If yes give brief description:

- NOT APPLICABLE

D. TYPE/NUMBERS OF PROPERTIES, IF ANY, FOUND WITHIN THE AREA OF SPREAD OF OIL

A. Structures / Properties

<table>
<thead>
<tr>
<th>S/N</th>
<th>Type of Structures</th>
<th>Description</th>
<th>Size</th>
<th>Number</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NONE</td>
<td>WITHIN</td>
<td></td>
<td></td>
<td>AREA OF IMPACT</td>
</tr>
</tbody>
</table>

Page 2 of 7
B. Crops/Economic Trees

<table>
<thead>
<tr>
<th>S/N</th>
<th>Types of crops</th>
<th>Young</th>
<th>Medium</th>
<th>Matured</th>
<th>Quantity</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>NONE</td>
<td>WITHIN</td>
<td>AREA OF</td>
<td>IMPACT</td>
<td></td>
</tr>
</tbody>
</table>

C. Fish/Nets/Ponds

<table>
<thead>
<tr>
<th>S/N</th>
<th>Fish/Nets/Ponds</th>
<th>Description</th>
<th>Quantity/Size</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NONE</td>
<td>WITHIN</td>
<td>AREA OF</td>
<td>IMPACT</td>
</tr>
</tbody>
</table>

D. Others (Specify) i.e. Animal Traps

<table>
<thead>
<tr>
<th>S/N</th>
<th>Others</th>
<th>Description</th>
<th>Quantity/Size</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NONE</td>
<td>WITHIN</td>
<td>AREA OF</td>
<td>IMPACT</td>
</tr>
</tbody>
</table>

E. GRAPHIC DESCRIPTION OF LEAK POINT (Details should be contained in leak repair report)

SKETCH OF LEAK POINT AT OPUKUSHI WELL 34 TANGO 4-INCH FLOWLINE

LEAK POINT (LACERATION AT 6 O'CLOCK)
### E. Coordinates

<table>
<thead>
<tr>
<th>S/N</th>
<th>Northing (M)</th>
<th>Easting (M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100 783</td>
<td>374 271</td>
</tr>
<tr>
<td>2</td>
<td>100 781</td>
<td>374 272</td>
</tr>
<tr>
<td>3</td>
<td>100 784</td>
<td>374 284</td>
</tr>
<tr>
<td>4</td>
<td>100 788</td>
<td>374 279</td>
</tr>
<tr>
<td>5</td>
<td>100 843</td>
<td>374 277</td>
</tr>
<tr>
<td>6</td>
<td>100 847</td>
<td>374 275</td>
</tr>
<tr>
<td>7</td>
<td>100 893</td>
<td>374 272</td>
</tr>
<tr>
<td>8</td>
<td>100 888</td>
<td>374 276</td>
</tr>
<tr>
<td>9</td>
<td>100 909</td>
<td>374 323</td>
</tr>
<tr>
<td>10</td>
<td>100 893</td>
<td>374 314</td>
</tr>
<tr>
<td>11</td>
<td>100 873</td>
<td>374 325</td>
</tr>
<tr>
<td>12</td>
<td>100 873</td>
<td>374 320</td>
</tr>
<tr>
<td>13</td>
<td>100 866</td>
<td>374 305</td>
</tr>
<tr>
<td>14</td>
<td>100 770</td>
<td>374 315</td>
</tr>
<tr>
<td>15</td>
<td>100 764</td>
<td>374 311</td>
</tr>
<tr>
<td>16</td>
<td>100 755</td>
<td>374 336</td>
</tr>
<tr>
<td>17</td>
<td>100 727</td>
<td>374 232</td>
</tr>
<tr>
<td>18</td>
<td>100 747</td>
<td>374 402</td>
</tr>
<tr>
<td>19</td>
<td>100 776</td>
<td>374 396</td>
</tr>
<tr>
<td>20</td>
<td>100 784</td>
<td>374 379</td>
</tr>
<tr>
<td>21</td>
<td>100 880</td>
<td>374 345</td>
</tr>
</tbody>
</table>
G. INCIDENT INFORMATION:

17. Impacted Area Details
   a. Total calculated area of impact
      - Impact within SPDC R.O.W. 9,226.358 m²
      - Impact outside R.O.W. NIL

18. Volume of oil recovered before completion of JIV (V_{rec}):
   Recovered oil V_{rec}:
   - NIL barrels

19. Computation of the residual volume on site
   a. Computation of the volume of pooled free phase oil (on land or confined water body).
      i. Area (m²) occupied by pool of free phase oil 9,068.480
      ii. Average Depth (m) of pool of free phase oil 0.002
      iii. Volume of pooled of free phase oil, V_{pool}:
          - 114.1 barrels

   b. Computation of volume of infiltrated oil in the soil (V-3).
      i. Area (m²) covered by the oil: NIL
      ii. Average Depth (m) below ground surface of infiltration of oil: NIL
      iii. Soil type: NOT APPLICABLE
      iv. \(p_e\) (effective porosity of the soil): NOT APPLICABLE

   v. Volume of infiltrated oil, \(V_w\):
      - NIL barrels

20. Computation of volume of oil on open water based on standard coloration.

<table>
<thead>
<tr>
<th>Thickness (mm)</th>
<th>Percentage coverage</th>
<th>Volume (m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barely Visible</td>
<td>0.00004</td>
<td>157.878 m²</td>
</tr>
<tr>
<td>Silvery</td>
<td>0.00008</td>
<td>0.000002</td>
</tr>
<tr>
<td>Slight Colour</td>
<td>0.00015</td>
<td>0.000001</td>
</tr>
<tr>
<td>Bright Colour</td>
<td>0.0003</td>
<td>0.000002</td>
</tr>
<tr>
<td>Dull</td>
<td>0.001</td>
<td>0.000032</td>
</tr>
<tr>
<td>Dark</td>
<td>0.002</td>
<td>0.000032</td>
</tr>
<tr>
<td>Black oil</td>
<td>0.1</td>
<td>-</td>
</tr>
<tr>
<td>Emulsion (30% Oil)</td>
<td>1</td>
<td>0.033476</td>
</tr>
</tbody>
</table>

Percent Total 100% Total Volume 0.2 bbl

Volume of oil on open water, $V_{o/w}$: 0.2 barrels

21. Calculation of evaporated volume:
   i. Oil type: Bonny Medium
   ii. E-Factor: 15%
   iii. Volume of evaporated oil, $V_{ev}$: 20.17 barrels

<table>
<thead>
<tr>
<th>Oil Type</th>
<th>Bonny Light</th>
<th>Bonny Medium</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>E-Factor</td>
<td>E-Factor</td>
</tr>
<tr>
<td>Period Since Oil Spill</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;1 day</td>
<td>10%</td>
<td>5%</td>
</tr>
<tr>
<td>1-7 days</td>
<td>25%</td>
<td>(15%)</td>
</tr>
<tr>
<td>&gt;7 days</td>
<td>40%</td>
<td>25%</td>
</tr>
</tbody>
</table>

9. Gross Total Estimated Spilled Volume: $V_{es}(bbls) = V_{vap}(bbls) + V_{wat}(bbls) + V_{nf}(bbls) + V_{pool}(bbls) + V_{ev}(bbls)$

$\begin{align*}
V_{es}(bbls) &= 20.17 + 0.2 + 114.1 = 134.47 \\
V_{ev}(bbls) &= 134.47 bbls
\end{align*}$

10. Net Total Estimated Spilled Volume: $V_{est}(bbls) = V_{vap}(bbls) + 0.6V_{wat}(bbls) + V_{nf}(bbls) + V_{pool} + V_{ev}(bbls)$

$\begin{align*}
V_{est}(bbls) &= 20.17 + (0.6 \times 0.2 = 0.12) + 114.1 = 134.39 \\
V_{est}(bbls) &= 134.39 bbls
\end{align*}$

*Conversion of m3 to barrel is Total volume VT (m3) x 6.29
*Emulsification factor for spill on water to consider is 60% of volume of oil.

This report was filled and signed on the 18/03/2011 at incident site by joint investigation representative from:
- Host Community
- Department of Petroleum Resources [DPR]
- National Oil Spill Detection and Response Agency [NOSDRA]
- State Ministry of Environment [SME]
- Nigeria Police Force [NPF]
- Shell Petroleum Development Company [SPDC]

Tick as applicable