



No. 01031

**A. GENERAL INFORMATION:**

1. Spill incident Number: 634250
2. Name of Location 6" IMO RIVER WELL 59 T FLOWLINE AT IMRWER
3. Name of nearest community UMU OKPARA
4. State ABIA LGA UKWA WEST
5. Type of Production facility/Installation FLOWLINE Asset owner /District NELI

**B. INCIDENT INFORMATION:**

6. Details of incident

- a. Date of incident 12TH MARCH, 2011
- b. Date/Period of investigation, 15TH MARCH, 2011
- c. Description of spill point environment

- |                                                               |     |     |
|---------------------------------------------------------------|-----|-----|
| <input checked="" type="checkbox"/> Firmed soil               | [Y] | [N] |
| <input type="checkbox"/> Loose soil                           | [Y] | [N] |
| <input checked="" type="checkbox"/> Previously excavated area | [Y] | [N] |
| <input type="checkbox"/> Under water                          | [Y] | [N] |
| <input type="checkbox"/> Swampy                               | [Y] | [N] |
| <input type="checkbox"/> Exposed pipe surface                 | [Y] | [N] |

AFTER JOINT INVESTIGATION OF THE INCIDENT SPILL WAS FOUND TO BE DUE TO THIRD PARTY INTERFERENCE

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

- |                                                                                |     |     |
|--------------------------------------------------------------------------------|-----|-----|
| <input type="checkbox"/> Drilled hole,                                         | [Y] | [N] |
| <input type="checkbox"/> Hack saw cut,                                         | [Y] | [N] |
| <input type="checkbox"/> Explosive tear,                                       | [Y] | [N] |
| <input type="checkbox"/> <del>Complete Rupture</del>                           | [Y] | [N] |
| <input type="checkbox"/> Inward dent,                                          | [Y] | [N] |
| <input type="checkbox"/> Well head tampering                                   | [Y] | [N] |
| <input checked="" type="checkbox"/> Failed Weld-on illegal hot tap valve,      | [Y] | [N] |
| <input type="checkbox"/> Missing pipeline (flowline)                           | [Y] | [N] |
| <input checked="" type="checkbox"/> Crude oil theft (illegal bunkering) point, | [Y] | [N] |
| <input type="checkbox"/> Third party tampering with Clamp Bolt/Nut,            | [Y] | [N] |
| <input type="checkbox"/> Third party tampering with valve setting,             | [Y] | [N] |
| <input type="checkbox"/> Third party tampering with flange Nuts/bolts,         | [Y] | [N] |
| <input type="checkbox"/> Corrosion,                                            | [Y] | [N] |
| Type: _____                                                                    | [Y] | [N] |
| <input type="checkbox"/> Saver-pit over flow,                                  | [Y] | [N] |
| <input type="checkbox"/> Surge vessel overflow,                                | [Y] | [N] |
| <input type="checkbox"/> Outward dent                                          | [Y] | [N] |
| <input type="checkbox"/> Others (specify). <u>NOT APPLICABLE</u>               | [Y] | [N] |

e. Spill point coordinates

Northing: 109601mN Easting: 526304mE



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**C. RISK/DAMAGE ASSESSMENT**

7. Type of environment of spill site:

- Land
- Swamp
- water

Type of environment of which oil has spread:

- Land
- Swamp
- water

8. Distance from the nearest sensitive habitat

- Government reserved and designated protected area [ ,m]
- Drinking water source [ ,m]
- Built up area [ ,m]
- Farmlands [ ,m]
- Fish Farm/Pond [ ,m]
- Fishing net [ ,m]
- Others (specify).

**NOT APPLICABLE**

9. Containment measures put in place;

- Booms [ Y ] [ N ]
- Trench [ Y ] [ N ]
- Dyke [ Y ] [ N ]

Others: NOT APPLICABLE

10. Any pictures or video coverage? [  ] [ 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

| S/N | Type of Structures                | Description | Size | Number | Comments |
|-----|-----------------------------------|-------------|------|--------|----------|
|     | <b>NONE WITHIN AREA OF IMPACT</b> |             |      |        |          |
|     |                                   |             |      |        |          |
|     |                                   |             |      |        |          |



B. Crops/Economic Trees

| S/N | Types of crops             | Young | Medium | Matured | Quantity | Comments |
|-----|----------------------------|-------|--------|---------|----------|----------|
|     | NONE WITHIN AREA OF IMPACT |       |        |         |          |          |

C. Fish/Nets/Ponds

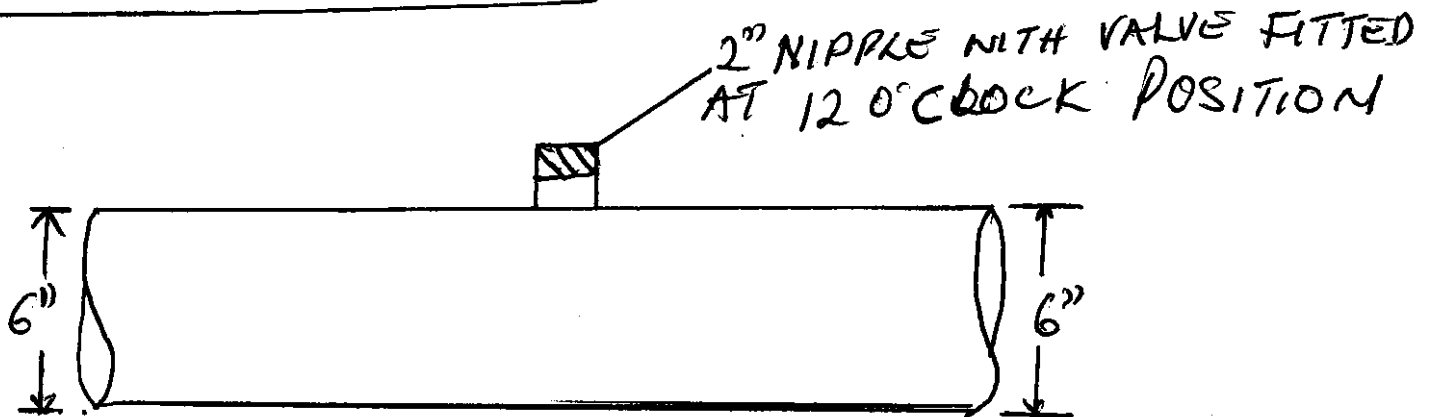
| S/N | Fish/Nets/Ponds            | Description | Quantity/Size | Comments |
|-----|----------------------------|-------------|---------------|----------|
|     | NONE WITHIN AREA OF IMPACT |             |               |          |

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

| S/N | Others                     | Description | Quantity/Size | Comments |
|-----|----------------------------|-------------|---------------|----------|
|     | NONE WITHIN AREA OF IMPACT |             |               |          |

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

A SECTION OF THE PIPE SHOWING THE ILLEGAL BUNKERING FITTING





F: TABLE SHOWING SOME OF COORDINATES TAKEN DURING JIV FOR AREA CALCULATION  
 E. Coordinates

| S/N | Northing   | Easting     |
|-----|------------|-------------|
| P1  | 109604 mN  | 526301 m E  |
| P2  | 109 601 mN | 526 301 m E |
| P3  | 109 601 mN | 526 307 m E |
| P4  | 109 598 mN | 526 307 m E |
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**G. INCIDENT INFORMATION:**

17 Impacted Area Details

- a. Total calculated area of impact 19m<sup>2</sup>
- Impact within SPDC R.O.W 19m<sup>2</sup>
  - Impact outside R.O.W NIL

18 Volume of oil recovered before completion of JIV (V<sub>recj</sub>):

Recovered oil V<sub>recj</sub>: 

|            |         |
|------------|---------|
| <u>NIL</u> | 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 (m<sup>2</sup>) occupied by pool of free phase oil NOT APPLICABLE
- ii. Average Depth (m) of pool of free phase oil NOT APPLICABLE
- iii.

Volume of pooled of free phase oil. V<sub>pool</sub>: 

|            |         |
|------------|---------|
| <u>NIL</u> | barrels |
|------------|---------|

iv.

b. Computation of volume of infiltrated oil in the soil (V-3).

- i Area (m<sup>2</sup>) covered by the oil: 19
- ii Average Depth (m) below ground surface of infiltration of oil: 0.02
- iii Soil type: CLAY
- iv. p<sub>e</sub> (effective porosity of the soil): 8%
- v.

Volume of infiltrated oil V<sub>inf</sub>: 

|             |         |
|-------------|---------|
| <u>0.19</u> | barrels |
|-------------|---------|

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

|                    | Thickness (mm) | Percentage coverage   | Volume (m3)                 |
|--------------------|----------------|-----------------------|-----------------------------|
| Barely Visible     | 0.00004        | <u>NOT APPLICABLE</u> |                             |
| Silvery            | 0.00008        |                       |                             |
| Slight Colour      | 0.00015        |                       |                             |
| Bright Colour      | 0.0003         |                       |                             |
| Dull               | 0.001          |                       |                             |
| Dark               | 0.002          |                       |                             |
| Black oil          | 0.1            |                       |                             |
| Emulsion (30% Oil) | 1              |                       |                             |
| Percent Total      |                | 100%                  | Total Volume <u>NIL</u> bbl |

Spill Factors from USCG FOG (2000 Edition)



**THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED**  
 JOINT INVESTIGATION REPORT FOR INCIDENT NO: 834250

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Volume of oil on open water,  $V_{wat}$ : NIL barrels

21. Calculation of evaporated volume:

- i. Oil type: BONNY MEDIUM
- ii. E-Factor: 15%
- iii.

Volume of evaporated oil,  $V_{vap}$ : 0.03 barrels

| Oil Type               |          | Bonny Light | Bonny Medium |
|------------------------|----------|-------------|--------------|
|                        |          | E-Factor    | E-Factor     |
| Period Since Oil Spill | <1 day   | 10%         | 5%           |
|                        | 1-7 days | 25%         | 15%          |
|                        | >7 days  | 40%         | 25%          |

9. Gross Total Estimated Spilled Volume  $V_{Est}(bbls) = V_{vap}(bbls) + V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recJ}(bbls)$

0.03 + NIL + 0.19 + NIL + NIL

$V_{Est}(bbls) =$  0.22

10. Net Total Estimated Spilled Volume  $V_{Est}(bbls) = V_{vap}(bbls) + 0.6 * V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recJ}(bbls)$

0.03 + NIL + 0.19 + NIL + NIL

$V_{Est}(bbls) =$  0.22

- \* Calculation of the respective estimated volume is to done using the new spill estimation software on site
- \* Conversion of m3 to barrel is Total volume VT (m3) x6.29
- \* Emulsification factor for spill on water to consider is 60% of volume of oil.

This report was filled and signed on the 15 / 03 / 20 11 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