



No. 00760

A. GENERAL INFORMATION:

1. Spill incident Number: 670232
2. Name of Location OBIGBO WELL 28 L/S FLOWLINE
3. Name of nearest community IMEA
4. State RIVERS LGA ETCHE
5. Type of Production facility/Installation FLOWLINE Asset owner /District NELI/PHI

B. INCIDENT INFORMATION:

6. Details of incident

- a. Date of incident 6TH JUNE, 2011
- b. Date/Period of investigation, 10TH JUNE, 2011
- c. Description of spill point environment

- | | | |
|--|-------|-------|
| <input type="checkbox"/> Firmed soil | [Y] ✓ | [N] |
| <input type="checkbox"/> Loose soil | [Y] | [N] ✓ |
| <input 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] ✓ |

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"/> Complete Rupture | [Y] | [N] ✓ |
| <input type="checkbox"/> Inward dent, | [Y] | [N] ✓ |
| <input type="checkbox"/> Well head tampering | [Y] | [N] ✓ |
| <input type="checkbox"/> Failed Weld-on illegal hot tap valve, | [Y] | [N] ✓ |
| <input type="checkbox"/> Missing pipeline (flowline) | [Y] | [N] ✓ |
| <input 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: <u>NOT APPLICABLE</u> | | |
| <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> | | |

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

e. Spill point coordinates (MINNA MID-BELT)

Northing: (METRES)

Easting: (METRES)

SPILL POINT 1: 100905.12

514131.44

SPILL POINT 2: 100908.50

514125.73

NOTE: SPILL POINT 1
 COMPRISES 2 NO.
 HACKSAW CUTS AS
 DEPICTED ON "GRAPHIC
 DESCRIPTION OF LEAK POINT"
 SKETCH (PAGE 3).



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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 [Nil ,m]
- Fish Farm/Pond [. ,m]
- Fishing net [. ,m]
- Others (specify). [. ,m]

FARMLAND SLIGHTLY IMPACTED

9. Containment measures put in place;

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

Others: NOT APPLICABLE

10. Any pictures or video coverage? [Y]✓ [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
NONE WITHIN AREA OF IMPACT					



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B. Crops/Economic Trees

S/N	Types of crops	Young	Medium	Matured	Quantity	Comments
1	CASSAVA		✓		A FEW	SLIGHT
2	OCROYAM		✓		STEMS	IMPACT ON
3	FRUITED PUMPKIN			✓		FARMLAND

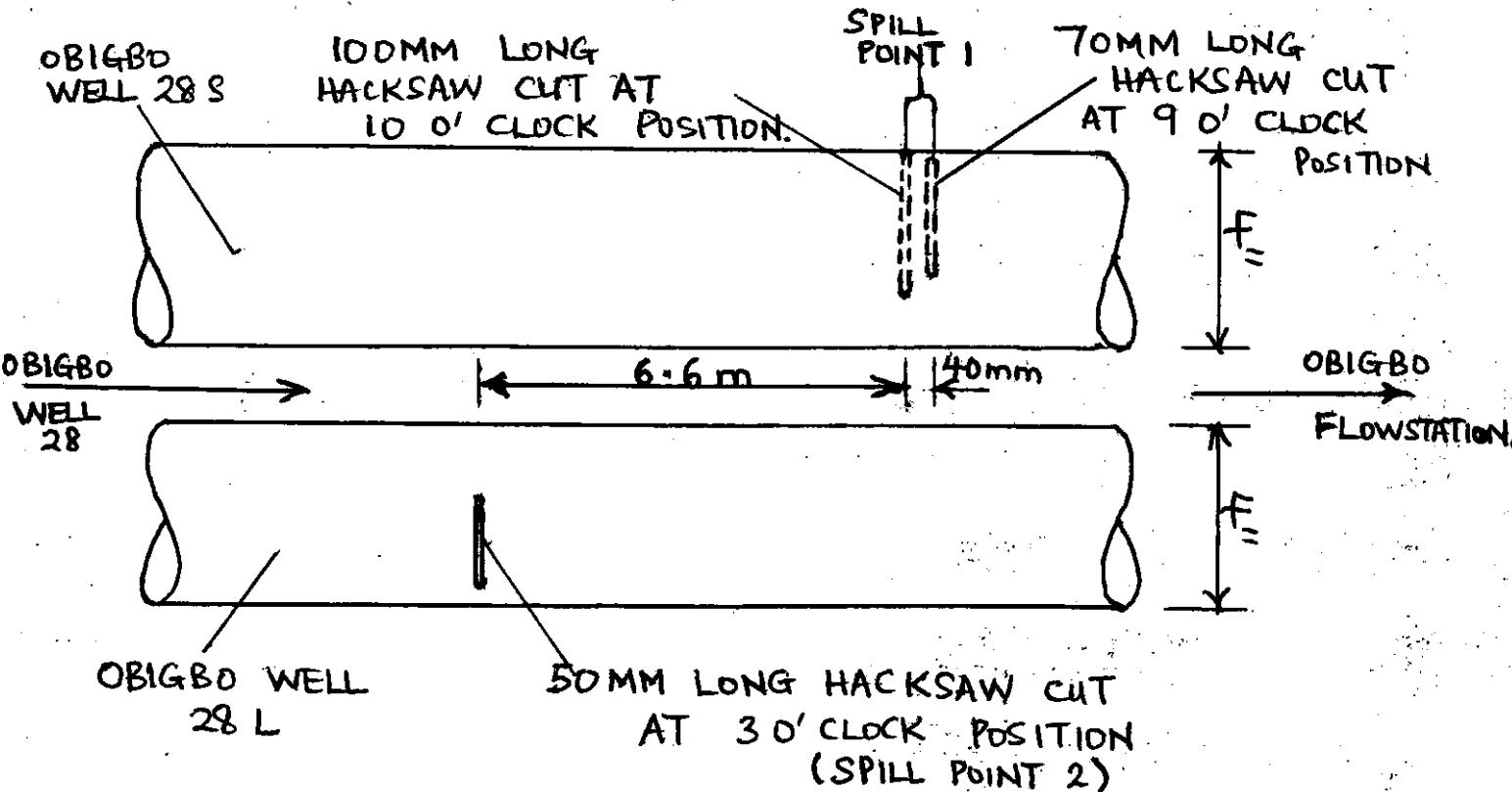
C. Fish/Nets/Ponds

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)



SECTION OF OBIGBO WELL 28 L/S FLOWLINE SHOWING POSITIONS OF HACKSAW CUTS (3 NO.)



F: TABLE SHOWING SOME OF COORDINATES TAKEN DURING JIV FOR AREA CALCULATION
 E. Coordinates (IMPACTED AREA BOUNDARY COORDINATES - MINNA MID-BELT)

S/N	Northing (METRES)	Easting (METRES)
48	100905.12	514131.44
49	100908.50	514125.73
50	100914.43	514116.47
51	100909.97	514123.88
52	100914.48	514128.72
53	100911.27	514131.83
54	100904.74	514132.48
55	100897.99	514142.77
56	100897.66	514142.39
57	100903.54	514132.97
58	100902.07	514131.88
59	100908.17	514119.52
60	100911.05	514120.99
61	100913.99	514116.09



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G INCIDENT INFORMATION:

17 Impacted Area Details

- a. Total calculated area of impact 95.83 m² (0.0096 Ha)
- Impact within SPDC R.O.W 94 m² (0.0094 Ha)
 - Impact outside R.O.W 1.83 m² (0.0002 Ha)

18 Volume of oil recovered before completion of JIV (V_{rec}):

Recovered oil V_{rec}:

3.02	barrels
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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 9.02
- ii. Average Depth (m) of pool of free phase oil 0.035
- iii. **EMULSIFICATION FACTOR DISCOUNTED IS 40%.**

Volume of pooled of free phase oil. V_{pool}:

1.19	barrels
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iv.

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

- i. Area (m²) covered by the oil: 86.81
- ii. Average Depth (m) below ground surface of infiltration of oil: 0.005
- iii. Soil type: CLAY
- iv. p_e (effective porosity of the soil): 8%

v.

Volume of infiltrated oil. V ₃	0.22	barrels
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20. Computation of volume of oil on open water based on standard coloration.

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

Spill Factors from USCG FOG (2000 Edition)



THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 670232

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Volume of oil on open water V_{wat} :	NIL	barrels
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21. Calculation of evaporated volume:

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

Volume of evaporated oil V_{ev} :	0.78	barrels
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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 $V_{Est}(bbls) = V_{vap}(bbls) + V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recJ}(bbls) = 0.78 + NIL + 0.22 + 1.19 + 3.02 = 5.21$

$V_{Est}(bbls) = 5.2$ BARRELS.

10. Net Total Estimated Spilled Volume $V_{Est}(bbls) = V_{vap}(bbls) + 0.6 \cdot V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recJ}(bbls) = 0.78 + NIL + 0.22 + 1.19 + 3.02 = 5.21$

$V_{Est}(bbls) = 5.2$ BARRELS.

*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 10 / 06 /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