



THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED  
 JOINT INVESTIGATION REPORT FOR INCIDENT NO: 670938

No. 00763

A. GENERAL INFORMATION:

1. Spill incident Number: 670938
2. Name of Location 28" BOMU - BONNY TRANS NIGER PIPELINE
3. Name of nearest community MORHO (OGONI)
4. State RIVERS LGA GOKANA
5. Type of Production facility/Installation PIPELINE Asset owner /District WIGIP/NEEP

B. INCIDENT INFORMATION:

6. Details of incident

- a. Date of incident 9<sup>TH</sup> JUNE, 2011
- b. Date/Period of investigation, 11<sup>TH</sup> 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>        | [Y]  | [N]✓ |

THE INVESTIGATING TEAM  
 OBSERVED THAT THE  
 SABOTAGE SPILL WAS  
 ACCOMPANIED BY FIRE.

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

e. Spill point coordinates (MINNA MID-BEIT)

Northing:

71345.21M

Easting:

535005.00M



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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 [ NIL ,m]
- Drinking water source [ NIL ,m]
- Built up area [ NIL ,m]
- Farmlands [ 2 ,m]
- Fish Farm/Pond [ NIL ,m]
- Fishing net [ NIL ,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? [ 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
	<u>NONE WITHIN AREA OF IMPACT</u>				



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B. Crops/Economic Trees

S/N	Types of crops	Young	Medium	Matured	Quantity	Comments
1	YAM	✓	✓	NIL	10m x 150	
2	CASSAVA	✓	✓	NIL	50m x 120m	

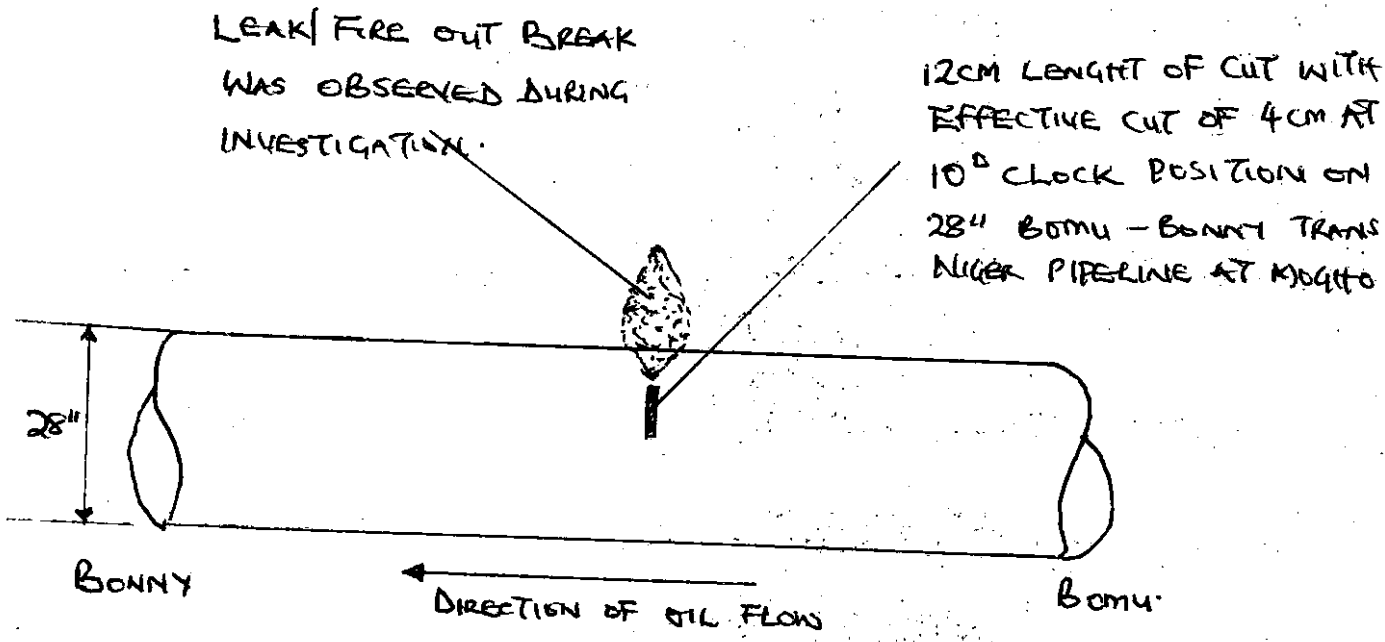
C. Fish/Nets/Ponds

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)







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**G. INCIDENT INFORMATION:**

**17 Impacted Area Details**

- a. Total calculated area of impact 0.022 Ha
  - Impact within SPDC R.O.W 0.014 Ha.
  - Impact outside R.O.W 0.008 Ha.

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

Recovered oil $V_{recj}$ :	<u>NIL</u>	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 ( $m^2$ ) occupied by pool of free phase oil 49  $m^2$
- ii. Average Depth (m) of pool of free phase oil 0.005m
- iii.

Volume of pooled of free phase oil. $V_{pool}$ :	<u>1.54</u>	barrels
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iv.

b. Computation of volume of infiltrated oil in the soil ( $V_3$ ).

- i. Area ( $m^2$ ) covered by the oil: 220  $m^2$
- ii. Average Depth (m) below ground surface of infiltration of oil: 0.003m.
- iii. Soil type: CLAY
- iv.  $p_e$  (effective porosity of the soil): 8%
- v.

Volume of infiltrated oil. $V_3$ :	<u>0.33</u>	barrels
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**20. Computation of volume of oil on open water based on standard coloration.**

	Thickness (mm)	Percentage coverage	Volume ( $m^3$ )
Barely Visible	0.00004		
Silvery	0.00008		
Slight Colour	0.00015	<b>NOT</b>	
Bright Colour	0.0003		
Dull	0.001	<b>APPLICABLE</b>	
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)



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  $V_{vap}$ : 0.33 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  $V_{Est}(bbls) = V_{vap}(bbls) + V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recJ}(bbls)$

$V_{Est}(bbls) = 0.33 + 0.33 + 1.54 = 2.20$  Barrels

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

$V_{Est}(bbls) = 2.20 \approx 2$  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 11 / 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