



THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED  
 JOINT INVESTIGATION REPORT FOR INCIDENT NO: 670901

No. 00752

A. GENERAL INFORMATION:

1. Spill incident Number: 670901
2. Name of Location 24" BOMU - BONNY TRANS NIGER PIPELINE
3. Name of nearest community BODO (EGONI)
4. State RIVERS LGA GOKANA
5. Type of Production facility/Installation PIPELINE Asset owner /District UG/P/NEP

B. INCIDENT INFORMATION:

6. Details of incident

- a. Date of incident 9<sup>TH</sup> JUNE 2011
- b. Date/Period of investigation, 10<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] ✓ |

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

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 checked="" type="checkbox"/> Others (specify) <u>NOT APPLICABLE</u> | [Y]   | [N] ✓ |

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

e. Spill point coordinates

Northing: (MINNA MID - BETT)  
70680.71 M

Easting:  
535043.36 M.



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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 [ 10 ,m]
- Fish Farm/Pond [ NIL ,m]
- Fishing net [ NIL ,m]
- Others (specify). NOT APPLICABLE

9. Containment measures put in place;

- Booms [Y] [NM]
- Trench [Y] [NM]
- 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	CASAVA	✓	✓	NIL	(20m x 15m)	

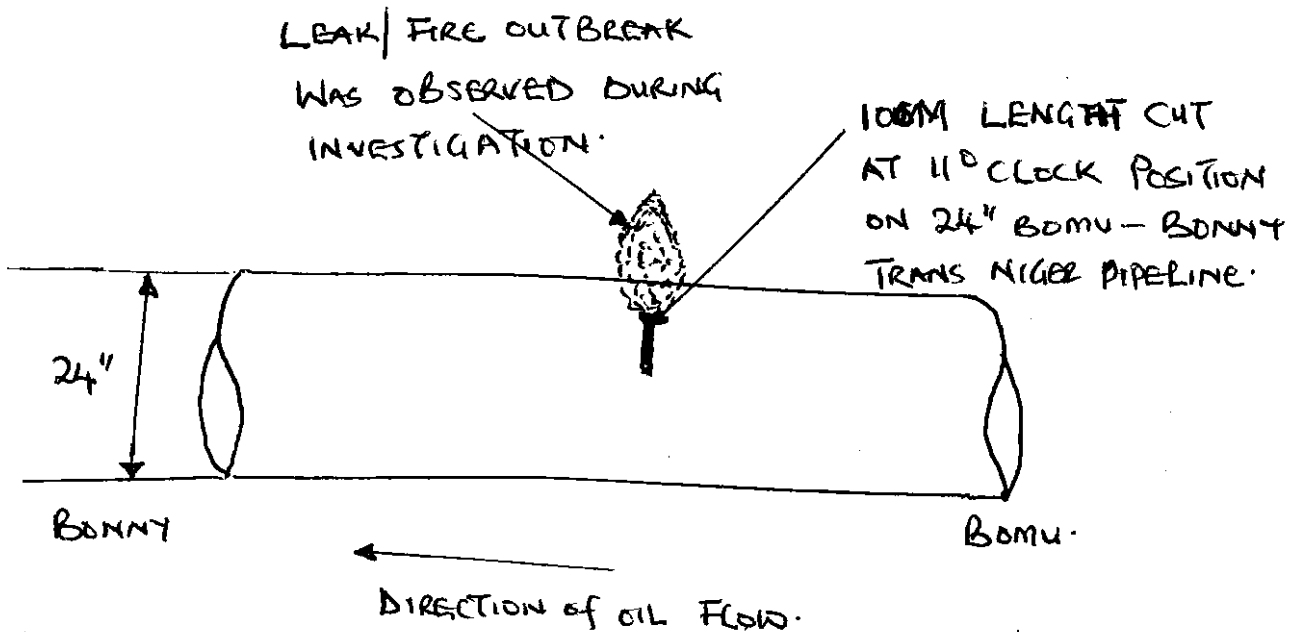
C. Fish/Nets/Ponds

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)





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

S/N	Northing meter	Easting meter
Pt 302	70678.60	535040.83
Pt 303	70684.74	535040.84
Pt 304	70681.65	535053.16
Pt 305	70687.79	525053.17
Pt 306	70681.64	535059.33
Pt 307	70684.71	535062.41
Pt 308	70697.01	535053.19
Pt 309	70712.36	535059.38
Pt 310	70693.90	535071.68
Pt 311	70684.68	535074.74



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**G INCIDENT INFORMATION:**

**17 Impacted Area Details**

- a. Total calculated area of impact 0.054 Ha
- Impact within SPDC R.O.W 0.019 Ha
  - Impact outside R.O.W 0.035 Ha

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

Recovered oil  $V_{rec}$ : 

10	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 \_\_\_\_\_
- ii. Average Depth (m) of pool of free phase oil \_\_\_\_\_
- iii. 

Volume of pooled of free phase oil. $V_{pool}$ :		barrels
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NOT APPLICABLE

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

- i. Area ( $m^2$ ) covered by the oil: 540 m<sup>2</sup>
- ii. Average Depth (m) below ground surface of infiltration of oil: 0.01
- iii. Soil type: CLAY
- iv.  $p_e$  (effective porosity of the soil): 8%
- v.

Volume of infiltration oil  $V_3$ : 

2.72	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		
Silvery	0.00008		
Slight Colour	0.00015	NOT	
Bright Colour	0.0003		
Dull	0.001	APPLICABLE	
Dark	0.002		
Black oil	0.1		
Emulsion (30% Oil)	1		
Percent Total		100%	Total Volume
			NIL bbl

Spill Factors from USCG FOG (2000 Edition)



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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 - $V_{vap}$	2.24	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  $V_{Est}(bbls) = V_{vap}(bbls) + V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recJ}(bbls)$

$V_{Est}(bbls) = 2.24 + 2.72 + 10 = 14.96$  BARRELS

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

$VEst(bbls) = 14.96$  BARREL  $\approx$  15 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*