



THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED
JOINT INVESTIGATION REPORT FOR INCIDENT NO: 779136

No. 00554

A. GENERAL INFORMATION:

1. Spill incident Number: 779136
2. Name of Location 6" OGBAHO NORTH - OHALE
3. Name of nearest community Kom Kom
4. State RIVERS LGA OGBAHO / ELOME
5. Type of Production facility/Installation PIPELINE Asset owner /District MESP

B. INCIDENT INFORMATION:

6. Details of incident

- a. Date of incident 20TH, FEBRUARY, 2012
- b. Date/Period of investigation, 24TH, FEBRUARY, 2012
- c. Description of spill point environment

- | | | |
|---|-------|-------|
| <input type="checkbox"/> Firmed soil | [Y] | [N] |
| <input checked="" type="checkbox"/> Loose soil | [X] | [N] |
| <input checked="" type="checkbox"/> Previously excavated area | [X] | [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 checked="" type="checkbox"/> Hack saw cut, | [X] | [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: SABOTAGE

- | | | |
|--|-------|-------|
| <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] |

e. Spill point coordinates

(MINNA MID BELT)

Northing: 93575.45m

Easting: 52171.96m ⁴ 23/02/12



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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 [,m]

9. Containment measures put in place;

- Booms [Y] [N]
- Trench [] [N]
- Dyke [] [N]
- Others: NOT APPLICABLE

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

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

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>					



B. Crops/Economic Trees

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

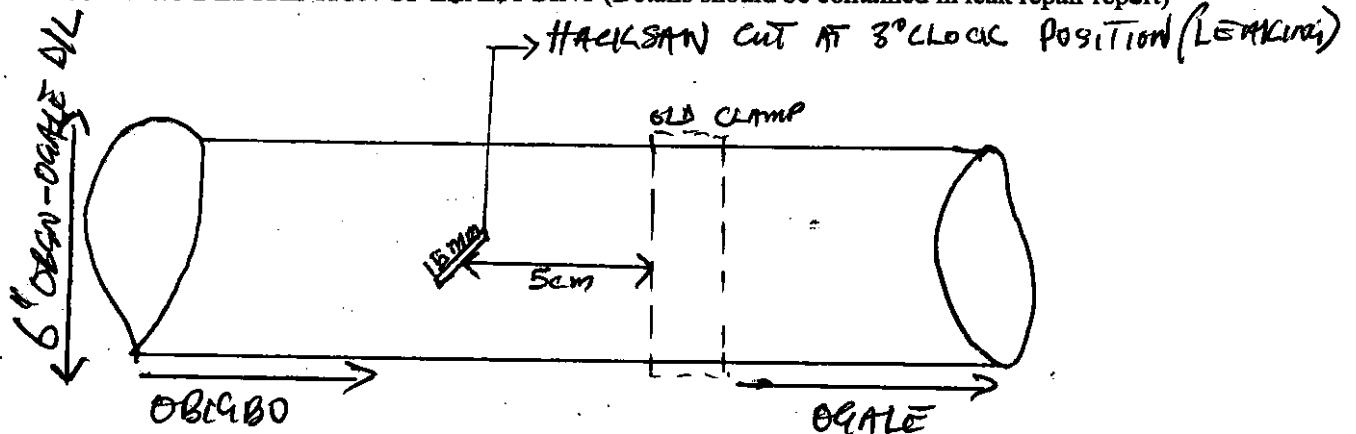
C. Fish/Nets/Ponds

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)



SECTION, SHOWING 6" ØBIBO NODIA-ØGALÉ D/L PIPELINE AT
 KOMIKOM, SHOWING, 1 NOS HACKSAW CUT SPOTS (LEAKING) AT 3⁰ CLOCK
 POSITION.



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

E. Coordinates **MINNA MID BELT**

S/N	Northing	Easting
1	93578.52m	521711.95m
2	93578.53m	521708.87m
3	93557.01m	521718.07m
4	93532.43m	521718.02m
5	93532.45m	521711.86m
6	93514.02m	521708.74m
7	93510.98m	521698.33m
8	93517.13m	521690.26m
9	93541.75m	521665.66m
10	93541.74m	521674.90m
11	93547.88m	521674.91m
12	93541.73m	521677.98m
13	93541.70m	521690.31m
14	93550.92m	521690.33m
15	93550.90m	521702.65m
16	93532.46m	521705.70m
_____		_____
_____		_____
_____		_____
_____		_____
_____		_____

Area 23/02/2012



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G. INCIDENT INFORMATION:

17 Impacted Area Details

- a. Total calculated area of impact 0.1449
- Impact within SPDC R.O.W _____
 - Impact outside R.O.W _____

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

Recovered oil V_{recj} :

<u>75</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 1400
- ii. Average Depth (m) of pool of free phase oil 0.001
- iii.

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

<u>8.8</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: 1400
- ii. Average Depth (m) below ground surface of infiltration of oil: 0.002
- iii. Soil type: MEDIUM SAND
- iv. p_e (effective porosity of the soil): 25%
- v.

<u>4.4</u>	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	<u>NOT</u>	
Silvery	0.00008		
Slight Colour	0.00015	<u>APPLICABLE</u>	
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)



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_{ev} : 15 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 $V_{Est}(bbls) = V_{vap}(bbls) + V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recJ}(bbls) = 15 + NIL + 4.4 + 8.8 + 75 = 103.2888$

$V_{Est}(bbls) =$

10. Net Total Estimated Spilled Volume $V_{Est}(bbls) = V_{vap}(bbls) + 0.6 * V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recJ}(bbls) = 15 + NIL + 4.4 + 8.8 + 75 = 103.2888$

$V_{Est}(bbls) = 103.2888$

*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 24th FEB /2012 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