

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0357-894080

(Note: As practicable as possible the JIT report is to be signed in the field by all the participating parties)

**A. GENERAL INFORMATION:**

1. Spill incident Number: 894080 2. Type of incident \* OIL SPILL  
 3. Name of Location IMC RIVER 1 WELL 25S FLOWLINE  
 4. Name of nearest community OWAZA 5. State: ABIA 6. LGA UKWA - WEST  
 7. Type of Production facility/Installation FLOWLINE 8. Asset owner/ District NEE 1/PHC 1

**B. INCIDENT INFORMATION:**

**9. Details of incident**

- a. Date of incident: 14<sup>th</sup> NOVEMBER, 2012  
 b. Start date/time of investigation: 16<sup>th</sup> NOVEMBER, 2012  
 c. Investigation End date: 16<sup>th</sup> NOVEMBER, 2012

d. Description of spill point environment

- Firmed soil  Loose soil  Previously excavated area  
 Under water  Swampy  Exposed pipe surface  
 Well Platform (on Water)  Rig

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

- Drilled hole  Hack saw cut  Explosive tear,  
 Complete Rupture  Inward dent,  Well head tampering  
 Failed Weld-on illegal hot tap valve,  Missing Pipeline/Flowline  
 Crude oil theft (illegal) bunkering) point,  Third party tampering with Clamp  
 Third party tampering with valve setting,  Third party tampering with flange,  
 Corrosion  Saver-pit over flow,  Surge vessel overflow  
 Outward dent  Flare System/Bund wall failure  
 Valve Failure  com unit failure  Cold vent  
 Relief valve failure  Others (specify) \_\_\_\_\_

f. Incident caused by:

- Third party interference  Operational  Mystery \_\_\_\_\_

g. Spill point coordinates.

Measuring unit <u>(METER)</u> ( <u>MINNA MID-BELT</u> )	
Northing: <u>108408.11m</u>	Easting: <u>523781.27m</u>

\*This can be a) Oil spill b) Drilling fluid/Chemical c) siltation d) construction e) Encroachment f) Fire,

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**C. RISK ASSESSMENT**

10. Type of environment:

- Land       Swamp       Water       Seasonal swamp

i. Type of environment to which oil has spread:

- Land       Swamp       Water       River (identify) \_\_\_\_\_

ii. Weather condition

- Raining       Sunny

11. Distance from the nearest sensitive habitat

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

[ ,m]  
[ ,m]  
[ ,m]  
[ ,m]  
[ ,m]  
[ ,m]  
[ ,m]  
} **NOT APPLICABLE**

12. Containment measures put in place;

- Booms       Trench       Dyke

Others: \_\_\_\_\_

13. Any pictures or video coverage?

[ Y ]  [ N ]

14. 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**

15. Structures / Properties

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

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16. Crops/Economic Trees

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

17. Fish/Nets/Ponds

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

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

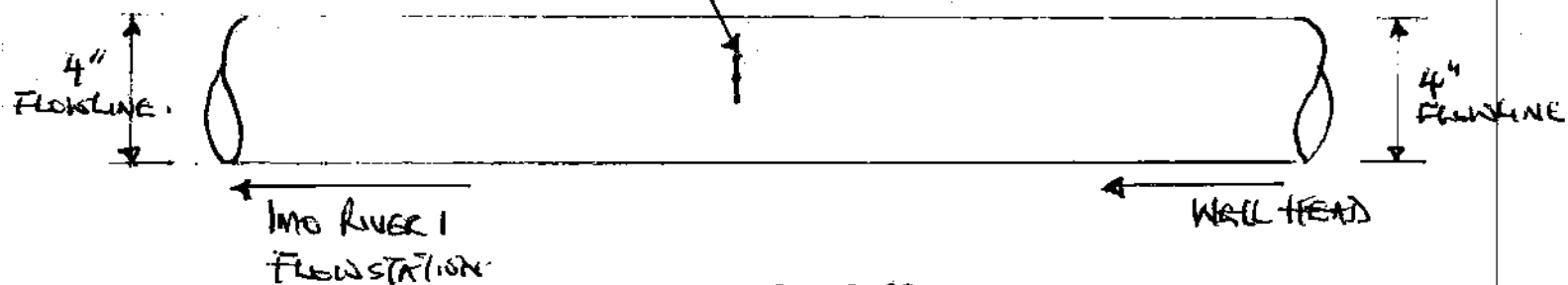
S/N	Others	Description	Quantity/Size	Comments
	NONE WITHIN AREA OF IMPACT			

E. GRAPHIC DESCRIPTION OF LEAK POINT *While detail report of the leak point should be contained in the Leak report, overview sketch of the site should be added as an appendix 1)*

SECTIONS SHOWING IMO RIVER 1 WELL 25S FLOWLINE SPILL POINT AT

OWAZA. (CAUSE AS HACKSAW CUT)

90mm LENGTH of cut with EFFECTIVE  
cut of 10mm AT 9° CLOCK POSITION  
ON IMO RIVER 1 WELL 25S FLOWLINE AT  
OWAZA.



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

19. Impacted area boundary Coordinates (If more than 12 points, Attach as an appendix 2)

(MINNA MID-BELL)

S/N	Northing (METER)	Easting (METER)
1.	108411.18m	523781.28m
2.	108401.94m	523793.58m
3.	108408.11m	523778.19m

16/11/2012

G. INCIDENT INFORMATION:

20. Impacted Area Details

- Total calculated area of impact 0.0033 Ha
- Impact within SPDC R.O.W Yes
- Impact outside R.O.W NO

21. Volume of oil recovered before completion of JIV (V<sub>rec</sub>):

Recovered oil V <sub>rec</sub>	<u>NIL</u>	barrels
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20. Computation of the residual volume on site

- a. Computation of volume of pool of free phase oil (on land or confined water body). 20 m<sup>2</sup>
- i. Area (m<sup>2</sup>) occupied by pool of free phase oil 20 m<sup>2</sup>
  - ii. Average Depth (m) of pool of free phase oil 0.03 m

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iii. Emulsification factor: NIL

iv. 

Volume of pool of free phase oil. $V_{pool}$ :	3.8	barrels
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b. Computation of volume of infiltrated oil in the soil ( $V_{inf}$ ).

*COMPUTATION OF SPILL POOL INFILTRATION VOLUME*  
 AREA = 3m<sup>2</sup>, DEPT 1m  
 (EFFECTIVE POROSITY 8%)  
 VOLUME = 3m<sup>2</sup> x 1m x 0.08  
 = 0.24 x 6.29 v  
 = 1.51 BBLs

i. Area \*(m<sup>2</sup>) covered by the oil: 10 m<sup>2</sup>

ii. Area of the pool of free phase oil in touch with soil: NIL

iii. Average Depth (m) below ground surface of infiltration of oil: 0.05 m

iv. Soil type: CLAY

$P_e$  (effective porosity of the soil): 8 %

iv. 

Volume of infiltrated oil. $V_{inf}$	0.25	barrels
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21. Computation of volume of oil on open water based on standard coloration.

i. Total area of oil on open water: NIL

ii. Table of average depth of oil on water based on coloration\*\*

	Thickness (mm)	Percentage coverage	Volume (m3)
Barely Visible	0.00004		
Silvery	0.00008		
Slight Color	0.00015	<b>NOT APPLICABLE</b>	
Bright Color	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

iii. 

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

i. Oil type: BONNY MEDIUM

ii. E-Factor: 15 %

iii. 

Volume of evaporated oil. $V_{evap}$ :	0.98	barrels
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Evaporation Factors (E-Factor) for SPDC Crude oil			
Oil Type	Days on site	Bonny Light	Bonny Medium
Period Since Oil Spill	< 1 day	10%	5%
	1-7 days	25%	15%
	> 7 days	40%	25%

\*If area is not same as the total area of impact, please indicate in the overview sketch  
 \*\* Spill Factor from USCG FOG (2000 Edition)

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<b>23. Gross Total Estimated Spilled Volume</b>
$V_{Est}(bbls) = V_{evap}(bbls) + V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recJ}(bbls)$
$V_{Est}(bbls) = 0.98 + NIL + (1.51 + 0.25) + 3.8 + NIL = 6.54 \text{ BARRELS}$
<b>24. Net Total Estimated Spilled Volume</b>
$V_{Est}(bbls) = V_{evap}(bbls) + 0.6 * V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recJ}(bbls)$
$V_{Est}(bbls) = 6.5 \approx 7 \text{ BARRELS}$

\*Calculation of the respective estimated volume is to be done on site as far as practicable using the new spill volume estimation software on site

\*Conversion of m3 to barrels is Total volume VT (m3) x 6.29

\*Emulsification factor for spill on water to consider is 60% of volume of oil.

**25. GENERAL STATUS OF THE SITE**

A. Joint investigation of the incident site found that there is no residual impact after the initial response and therefore recommend that the site be closed out <input type="checkbox"/>
B. Investigation of the incident site showed that there is residual impact on site requiring further works <input checked="" type="checkbox"/>

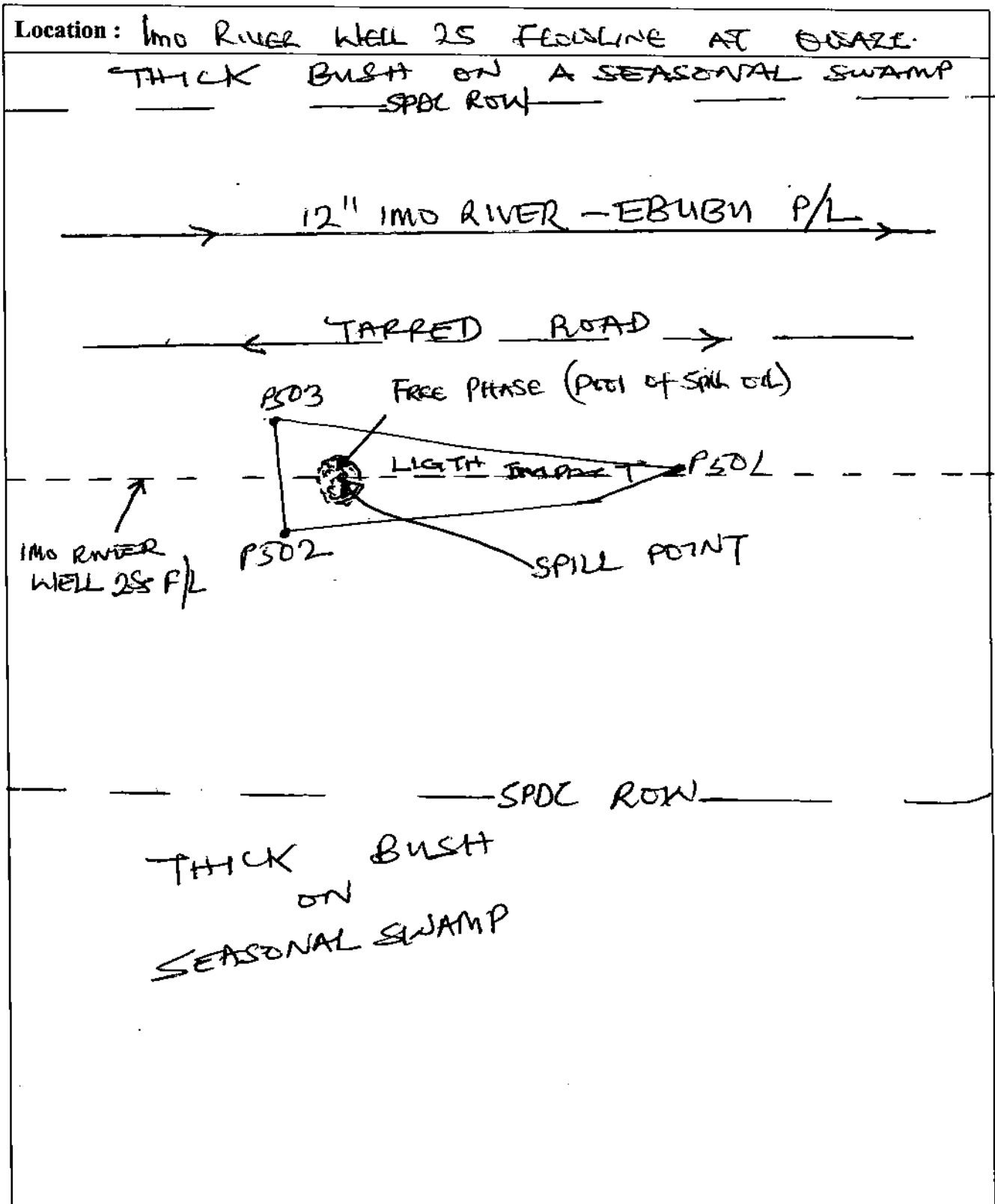
**26 REPRESENTATIVES**

This report was filled and signed on the <u>16 / 11 / 2012</u> at incident site by joint investigation representatives from
<ul style="list-style-type: none"><li>• Host Community <input checked="" type="checkbox"/></li><li>• Department of Petroleum Resources [DPR]: <input checked="" type="checkbox"/></li><li>• National Oil Spill Detection and Response Agency [NOSDRA]: <input checked="" type="checkbox"/></li><li>• State Ministry of Environment [SME]: <input type="checkbox"/></li><li>• Nigeria Police Force [NPF]: <input type="checkbox"/></li><li>• Shell Petroleum Development Company [SPDC]: <input checked="" type="checkbox"/></li></ul>
<i>Tick as applicable</i>

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27. Appendix 1: Overview sketch of the site



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21. Appendix 2: TABLE SHOWING ADDITIONAL COORDINATES TAKEN DURING JIV FOR AREA CALCULATION

(MINNA MID-BEIT)

S/N	Northing (Meter)	Easting (Meter)

*[Signature]*  
16/11/2012