

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0105 712898

(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: 712898 2. Type of incident\* OIL SPILL  
 3. Name of Location IMO RIVER III WELL 1 T FLOWLINE  
 4. Name of nearest community IPU-WEST 5. State: ABIA 6. LGA UKWA - WEST  
 7. Type of Production facility/Installation FLOWLINE 8. Asset owner/District NELI/PH 2

**B. INCIDENT INFORMATION:**

9. Details of incident

- a. Date of incident: 12TH SEPTEMBER, 2011  
 b. Date/Period of investigation: 14TH AND 15TH SEPTEMBER, 2011  
 c. Description of spill point environment  
 Firmed soil  Loose soil  Previously excavated area  
 Under water  Swampy  Exposed pipe surface  
 Well Platform (on Water)  Rig  
 d. 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,  
 External Corrosion  Internal 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) NOT APPLICABLE  
 e. Incident due to:  
 Third party interference  Operational  Others (specify) NOT APPLICABLE

f. Spill point coordinates (MINNA MID-BELT)

Measuring unit <u>M</u>	
Northing: <u>107952.21</u>	Easting: <u>525955.30</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) NOT APPLICABLE

ii. Weather condition

- Raining       Sunny

11. Distance from the nearest sensitive habitat

- Government reserved and designated protected area [      ,m]  
 Drinking water source [      ,m]  
 Built up area [ 20 ,m]  
 Farmlands [      ,m]  
 Fish Farm/Pond [      ,m]  
 Fishing net [      ,m]  
 Others (specify).

12. Containment measures put in place;

- Booms       Trench       Dyke

Others: NOT APPLICABLE

13. Any pictures or video coverage? [Y] [N]

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

If yes give brief description:

THOROUGH ASSESSMENT OF THE IMPACTED AREA AND VOLUME SPILLED WAS DISRUPTED BY HEAVY RAINFALL ON THE 14TH OF SEPTEMBER; THUS JIV COMPLETION WAS DELAYED TILL THE NEXT DAY, 15TH SEPTEMBER.

**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
<u>NONE WITHIN AREA OF IMPACT</u>					

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16. Crops/Economic Trees

S/N	Type of crops	Young	Medium	Matured	Quantity	Comments
1	PLANTAIN			✓	5	PLANTAIN TREES IMPACTED BY SPILL

17. Fish/Nets/Ponds

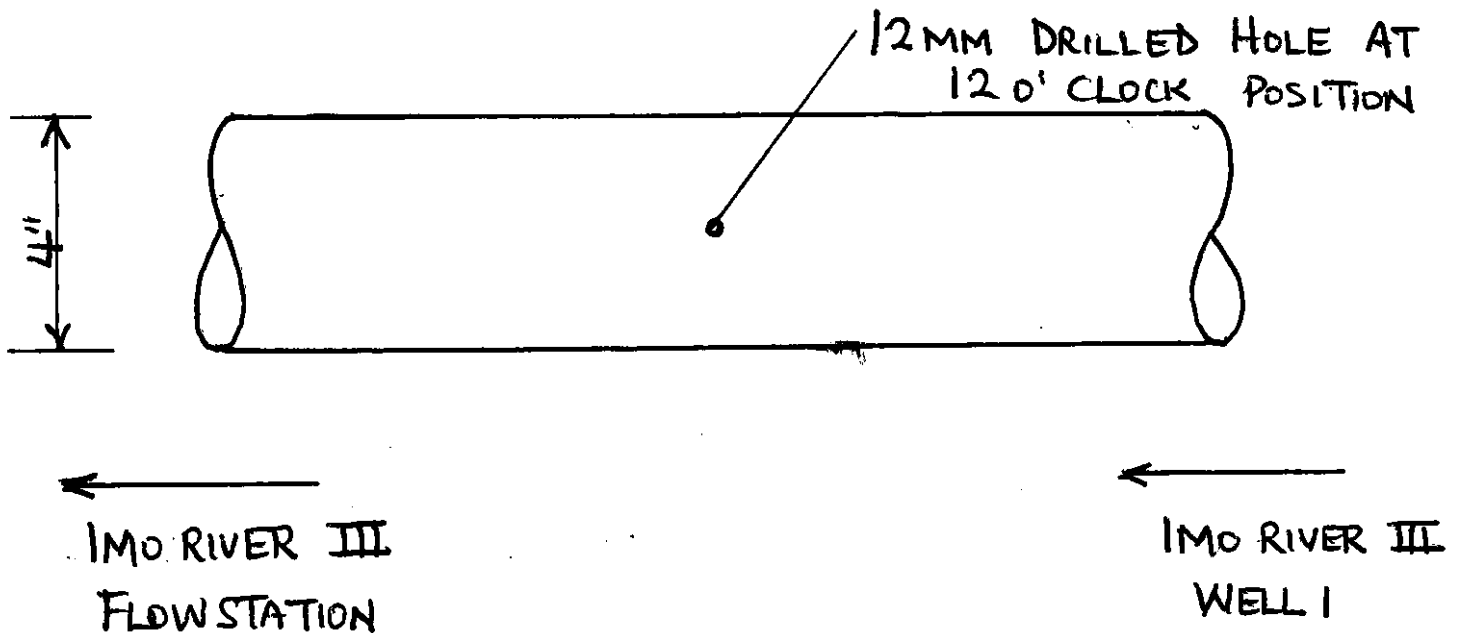
S/N	Fish/Nets/Ponds	Description	Quantity/Size	Comments
	NONE WITHIN AREA OF IMPACT			

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 (Overview sketch of the site should be added as an appendix!)

SECTION OF IMO RIVER III WELL 1 T FLOWLINE SHOWING POSITION OF DRILLED HOLE.



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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-BELT)

S/N	Northing (M)	Easting (M)
334	107949.12	525964.54
335	107946.05	525961.45
340	107942.99	525958.36
347	107939.92	525955.28
358	107915.42	525921.34
359	107918.50	525915.19
364	107927.75	525899.80
363	107930.81	525902.89
362	107936.94	525909.06
367	107927.71	525918.28
360	107924.63	525921.36
357	107921.55	525924.43
368	107939.99	525918.31

G. INCIDENT INFORMATION:

20. Impacted Area Details

- Total calculated area of impact 0.09 Ha
- Impact within SPDC R.O.W 0.09 Ha
- Impact outside R.O.W NIL

21. Volume of oil recovered before completion of JIV ( $V_{recJ}$ ):

Recovered oil $V_{recJ}$	<u>0.19</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).

- Area ( $m^2$ ) occupied by pool of free phase oil 369
- Average Depth (m) of pool of free phase oil 0.003
- Emulsification factor: NIL

iv. Volume of pool of free phase oil. $V_{pool}$ :	<u>6.96</u>	barrels
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b. Computation of volume of infiltrated oil in the soil ( $V_{inf}$ ).

- i. Area ( $m^2$ ) covered by the oil: 506
  - ii. Area of the pool of free phase oil in touch with soil: 104
  - iii. Average Depth (m) below ground surface of infiltration of oil: 0.008
  - iv. Soil type: CLAY
  - v.  $P_e$  (effective porosity of the soil): 8%
- |                                          |             |         |
|------------------------------------------|-------------|---------|
| iv. Volume of infiltrated oil. $V_{inf}$ | <u>2.46</u> | barrels |
|------------------------------------------|-------------|---------|

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	<b>NOT APPLICABLE</b>	
Silvery	0.00008		
Slight Color	0.00015		
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. $V_{wat}$ :	<u>NIL</u>	barrels
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22. Calculation of evaporated volume:

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

iii. Volume of evaporated oil. $V_{evap}$ :	<u>1.7</u>	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%

<p>23. Gross Total Estimated Spilled Volume <math>V_{Est}(bbls) = V_{evap}(bbls) + V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recJ}(bbls) = 1.7 + NIL + 2.46 + 6.96 + 0.19 = 11.31</math></p>
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$V_{Est}(bbls)=$	<b>11.3 BARRELS</b>
24. <u>Net Total Estimated Spilled Volume</u> $V_{Est}(bbls) = V_{evap}(bbls) + 0.6 * V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recJ}(bbls) = 1.7 + NIL + 2.46 + 6.96 + 0.19 = 11.3$	
$V_{Est}(bbls)=$	<b>11.3 BARRELS</b>

\*Calculation of the respective estimated volume is to be done using the new spill 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"/>

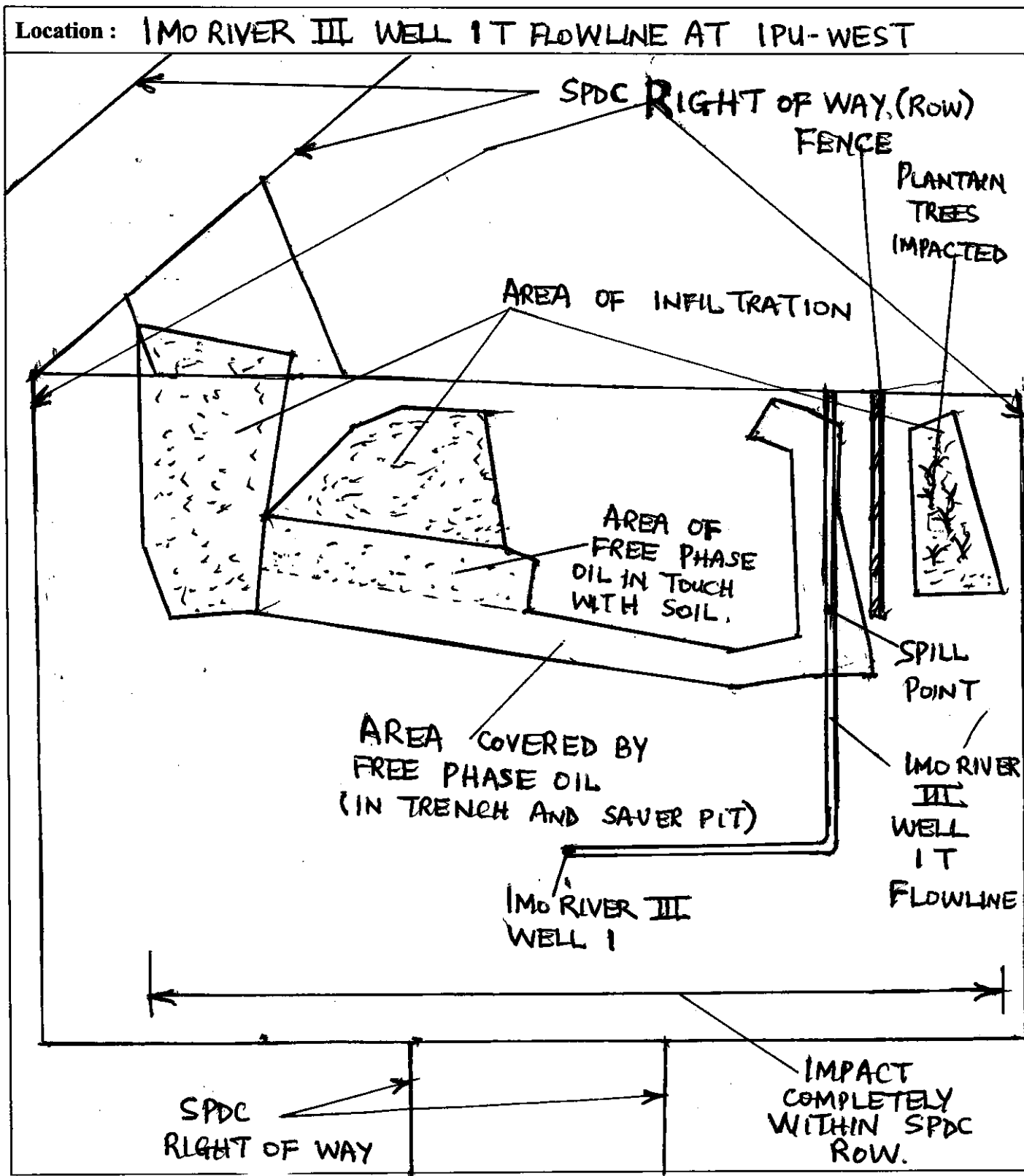
**26 Signatories**

This report was filled and signed on the <u>15/09/2011</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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20. 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-BELT)

S/N	Northing (M)	Easting (M)
369	107943.06	525921.40
353	107946.12	525930.64
354	107939.96	525936.79
355	107939.95	525936.87
356	107936.88	525942.95
342	107939.94	525949.12
341	107942.99	525955.28
339	107946.06	525958.37
345	107955.30	525946.07
351	107955.31	525942.98
343	107958.38	525942.99
344	107958.37	525946.07
346	107958.37	525949.15
337	107955.29	525952.23
336	107952.20	525958.38
370	107967.58	525949.17
371	107964.51	525949.16
372	107955.27	525961.47
373	107964.48	525964.57