

**THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED**

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0123732784

(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: 732784 2. Type of incident\* SPILL  
 3. Name of Location 10" DIEBY CREEK PIPELINE  
 4. Name of nearest community OPOROMA 5. State: BAYELSA 6. LGA SOUTHER IJAW  
 7. Type of Production facility/Installation PIPELINE 8. Asset owner/District NESP

**B. INCIDENT INFORMATION:**

9. Details of incident

- a. Date of incident: 27<sup>TH</sup> OCTOBER 2011  
 b. Date/Period of investigation: 8<sup>TH</sup> TO 9<sup>TH</sup> NOVEMBER 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) \_\_\_\_\_

e. Incident due to:

- Third party interference  Operational  Others (specify) \_\_\_\_\_

f. Spill point coordinates

Measuring unit		<u>MINNA MID BELT</u>	
Northing:		Easting:	
1.	<u>88839.96m</u>		<u>405273.06m</u>
2.	<u>88832.59m</u>		<u>405270.99m</u>
3.	<u>88825.68m</u>		<u>405269.94m</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 [      ,m]  
 Drinking water source [      ,m]  
 Built up area [      ,m]  
 Farmlands [      ,m]  
 Fish Farm/Pond [      ,m]  
 Fishing net [      ,m]  
 Others (specify). [      ,m]
- NOT APPLICABLE

12. Containment measures put in place;

- Booms       Trench       Dyke

Others: NO CONTAINMENT IN PLACE

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

14. 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**

15. Structures / Properties

S/N	Type of Structures	Description	Size	Number	Comments
	NONE WITHIN AREA OF IMPACT				

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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

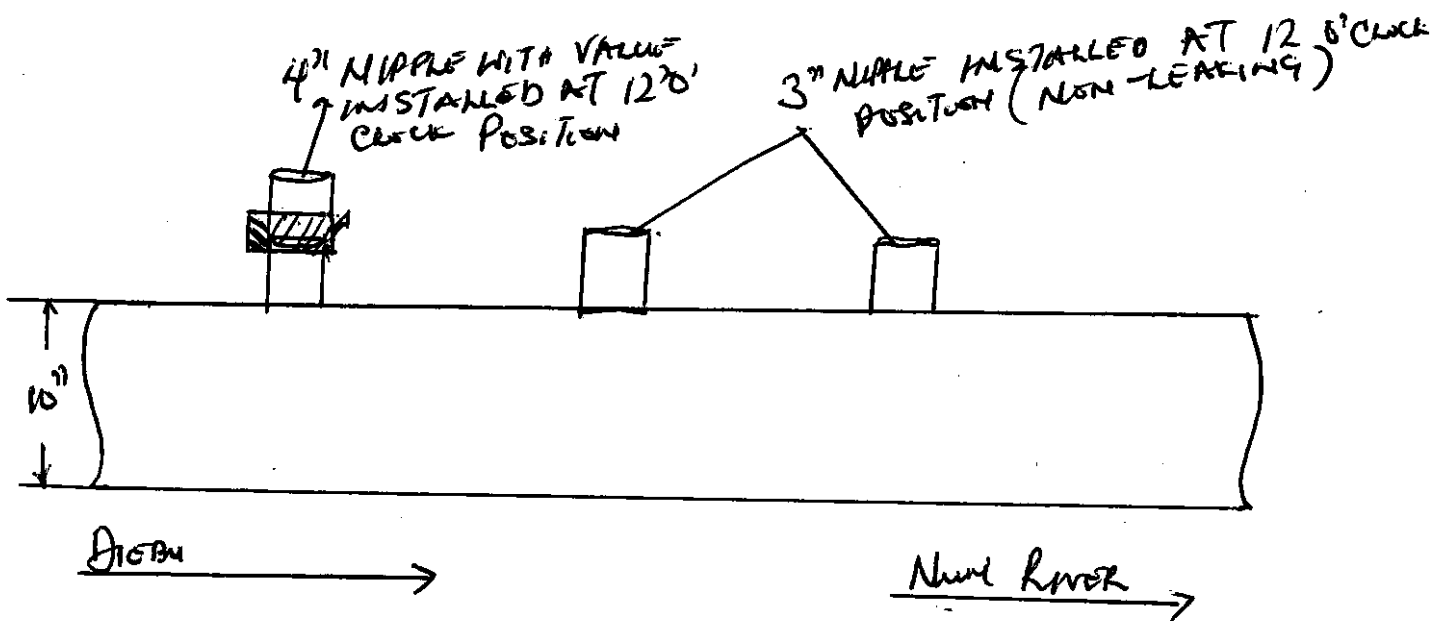
S/N	Fish/Nets/Ponds	Description	Quantity/Size	Comments
	NONE WITHIN AREA OF IMPACT			

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 (Overview sketch of the site should be added as an appendix 1)

A SECTION OF 10" DIEBU CREEK PIPELINE AT OFOROMA  
THREE  
SHOWING ILLEGAL BUNKERING POINTS AT 12 O' CLOCK POSITION



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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	Easting
1	89061.33m	405236.62m
2	89053.08m	405283.07m
3	89049.90m	405313.89m
4	89025.20m	405344.60m
5	88942.26m	405332.00m
6	88945.43m	405304.30m
7	88970.06m	405292.02m
8	88815.68m	405277.20m
9	88798.01m	405269.80m
10	88804.18m	405263.70m
11	88825.74m	405251.40m
12	88874.92m	405251.60m
13	88964.00m	405267.30m

G. INCIDENT INFORMATION:

20. Impacted Area Details

- Total calculated area of impact 1.18Ha
- Impact within SPDC R.O.W \_\_\_\_\_
- Impact outside R.O.W \_\_\_\_\_

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

Recovered oil $V_{rec}$	<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)
- Area ( $m^2$ ) occupied by pool of free phase oil 8000
  - Average Depth (m) of pool of free phase oil 0.071
  - Emulsification factor: NIL

iv. Volume of pool of free phase oil. $V_{pool}$ :	<u>50.3</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: 3800
- ii. Area of the pool of free phase oil in touch with soil: 8000
- iii. Average Depth (m) below ground surface of infiltration of oil: 0.002
- iv. Soil type: CLAY
- v.  $P_e$  (effective porosity of the soil): 8%

iv. Volume of infiltrated oil, $V_{inf}$	<u>11.9</u>	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	<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 LIGHT
- ii. E-Factor: 40%

iii. Volume of evaporated oil, $V_{evap}$ :	<u>41.5</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%

23. Gross Total Estimated Spilled Volume  $V_{Est}(bbls) = V_{evap}(bbls) + V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{rec}(bbls) = 41.5 + NIL + 11.9 + 50.3 + NIL = 103.7$  BARRELS

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$V_{Est}(bbls) = 103.7 \text{ BARRELS}$
24. Net Total Estimated Spilled Volume $V_{Est}(bbls) = V_{evap}(bbls) + 0.6 * V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recl}(bbls) = 41.5 + null + 11.9 + 50.3 + null = 103.7 \text{ BARRELS}$
$V_{Est}(bbls) = 103.7 \text{ BARRELS}$

- \*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"/>

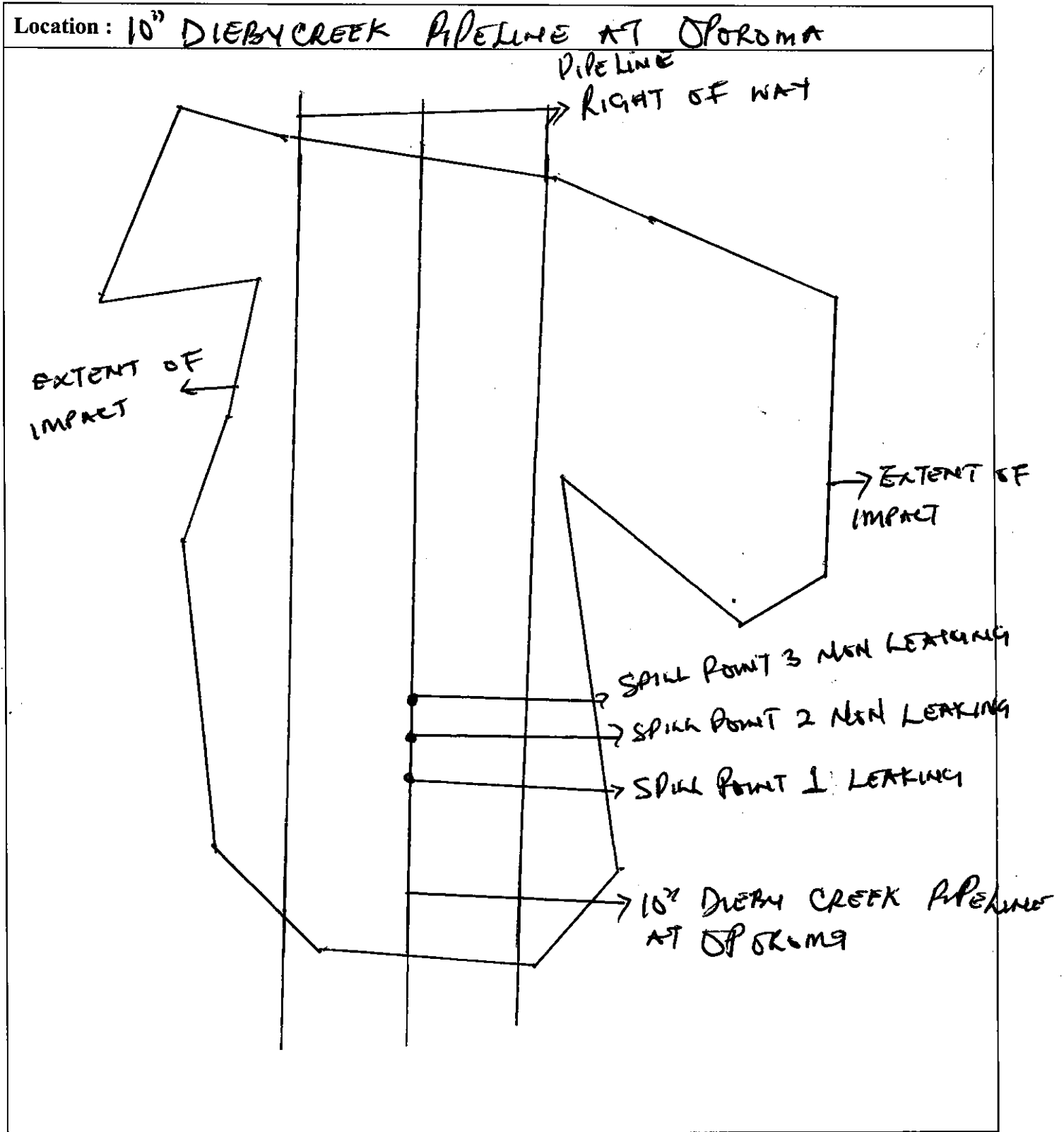
**26 Signatories**

This report was filled and signed on the <u>09/11/2011</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 type="checkbox"/></li><li>• National Oil Spill Detection and Response Agency [NOSDRA]: <input checked="" type="checkbox"/></li><li>• State Ministry of Environment [SME]: <input checked="" type="checkbox"/></li><li>• Nigeria Police Force [NPF]: <input checked="" 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	Easting
14	89022.36	405279.90m
15	89012.31	405250.10m