

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0126
726993

(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: 726993 2. Type of incident* OIL SPILL
 3. Name of Location 12" ADIBAWA - OKORDIA PIPELINE.
 4. Name of nearest community IKARAWA 5. State: BAYELSA 6. LGA YENAGOA
 7. Type of Production facility/Installation PIPELINE 8. Asset owner/District UIG/PI/NGSP

B. INCIDENT INFORMATION:

9. Details of incident

- a. Date of incident: 13TH OCTOBER, 2011
 b. Date/Period of investigation: 17TH OCTOBER, 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

Measuring unit <u>METER</u> (<u>MINNA MID - BEIT.</u>)	
Northing: <u>129162 mN</u>	Easting: <u>445621 mE</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 [NIL ,m]
 Drinking water source [NIL ,m]
 Built up area [NIL ,m]
 Farmlands [40 ,m]
 Fish Farm/Pond [NIL ,m]
 Fishing net [NIL ,m]
 Others (specify). NIL

12. Containment measures put in place;

- Booms Trench Dyke

Others: NATURAL CONTAINMENT. (PIT)

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

NONE WITHIN AREA OF IMPACT.

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16. Crops/Economic Trees

S/N	Type of crops	Young	Medium	Matured	Quantity	Comments
✓	CASSAVA	—	✓	—	40m x 10m	
	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)

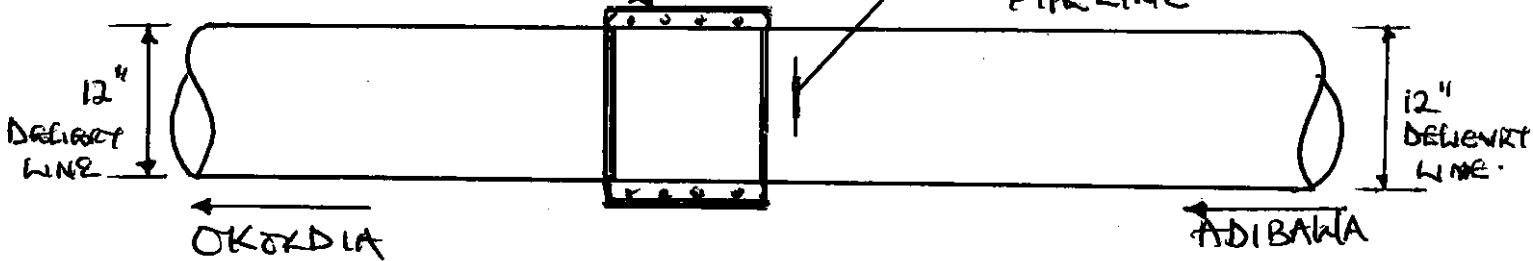
INCIDENT NUMBER, 552560

PREVIOUSLY CLAIMED LEAK POINT.

WITH CAUSE OF SPILL AS HACKSAW CUT AT 10° CLOCK POSITION.

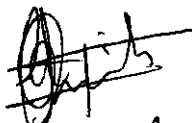
QUANTITY SPILL 167 BARRELS AND QUANTITY RECOVERED GROSS 550 BARRELS

CURRENT LEAK POINT 8cm CUT AND 4cm EFFECTIVE CUT AT 9° CLOCK POSITION ON 12" ADIBAWA - OKORDIA PIPELINE.

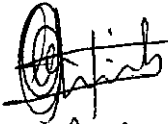


SECTION OF 12" ADIBAWA - OKORDIA PIPELINE AT KARAMA
 SHOWING POSITION OF HACKSAW CUT.

12" ADIBAWA-OKORDIA DL @ IKARAMA			
PT	X	Y	Remarks
P 46	445621.13	129162.16	Spill Point
P 47	445624.25	129174.45	Light Impact
P 48	445627.32	129171.36	Light Impact
P 49	445627.31	129168.29	Light Impact
P 53	445627.31	129168.29	Light Impact
P 52	445624.23	129168.3	Light Impact
P 50	445624.22	129165.23	Light Impact
P 54	445627.3	129165.22	Light Impact
P 51	445624.21	129162.15	Light Impact
P 55	445624.2	129159.08	Light Impact
P 56	445605.67	129143.78	Light Impact
P 57	445593.3	129131.52	Light Impact
P 58	445596.37	129125.37	Light Impact
P 60	445620.94	129103.78	Light Impact
P 62	445614.76	129097.65	Light Impact
P 63	445608.57	129088.45	Light Impact
P 64	445614.71	129082.29	Light Impact
P 65	445617.77	129076.13	Light Impact
P 66	445608.49	129063.87	Light Impact
P A	445561.509	129027.85	Estimated point
P 76	445540.65	129045.65	Light Impact
P 75	445546.86	129057.92	Light Impact
P 74	445562.31	129073.24	Light Impact
P 73	445571.56	129076.28	Light Impact
P 72	445571.59	129085.5	Light Impact
P 71	445583.95	129097.75	Light Impact
P 70	445590.1	129091.59	Light Impact
P 69	445596.28	129097.71	Light Impact
P 68	445599.35	129094.63	Light Impact
P 67	445608.61	129100.75	Light Impact
P 61	445611.71	129106.88	Light Impact
P 77	445608.63	129106.89	Light Impact
P 78	445602.49	129113.06	Light Impact
P 59	445599.43	129119.21	Light Impact
P 79	445593.29	129125.38	Light Impact
P 87	445534.6	129079.47	Light Impact
P 86	445516.08	129067.24	Light Impact
P 85	445509.91	129067.26	Light Impact
P 84	445506.86	129076.49	Light Impact
P 83	445519.22	129085.67	Light Impact
P 82	445537.76	129104.05	Light Impact
P 81	445556.32	129128.57	Light Impact
P 80	445590.26	129143.83	Light Impact


 Njelanah. G.
 19/10/2011

PT	Date	Lat	Lon	North2	East2
P 46	17/10/201	N5 09 56.7	006 28 13.8	129162.16	445621.13
P 47	17/10/201	N5 09 57.1	006 28 13.9	129174.45	445624.25
P 48	17/10/201	N5 09 57.0	006 28 14.0	129171.36	445627.32
P 49	17/10/201	N5 09 56.9	006 28 14.0	129168.29	445627.31
P 50	17/10/201	N5 09 56.8	006 28 13.9	129165.23	445624.22
P 51	17/10/201	N5 09 56.7	006 28 13.9	129162.15	445624.21
P 52	17/10/201	N5 09 56.9	006 28 13.9	129168.3	445624.23
P 53	17/10/201	N5 09 56.9	006 28 14.0	129168.29	445627.31
P 54	17/10/201	N5 09 56.8	006 28 14.0	129165.22	445627.3
P 55	17/10/201	N5 09 56.6	006 28 13.9	129159.08	445624.2
P 56	17/10/201	N5 09 56.1	006 28 13.3	129143.78	445605.67
P 57	17/10/201	N5 09 55.7	006 28 12.9	129131.52	445593.3
P 58	17/10/201	N5 09 55.5	006 28 13.0	129125.37	445596.37
P 59	17/10/201	N5 09 55.3	006 28 13.1	129119.21	445599.43
P 60	17/10/201	N5 09 54.8	006 28 13.8	129103.78	445620.94
P 61	17/10/201	N5 09 54.9	006 28 13.5	129106.88	445611.71
P 62	17/10/201	N5 09 54.6	006 28 13.6	129097.65	445614.76
P 63	17/10/201	N5 09 54.3	006 28 13.4	129088.45	445608.57
P 64	17/10/201	N5 09 54.1	006 28 13.6	129082.29	445614.71
P 65	17/10/201	N5 09 53.9	006 28 13.7	129076.13	445617.77
P 66	17/10/201	N5 09 53.5	006 28 13.4	129063.87	445608.49
P 67	17/10/201	N5 09 54.7	006 28 13.4	129100.75	445608.61
P 68	17/10/201	N5 09 54.5	006 28 13.1	129094.63	445599.35
P 69	17/10/201	N5 09 54.6	006 28 13.0	129097.71	445596.28
P 70	17/10/201	N5 09 54.4	006 28 12.8	129091.59	445590.1
P 71	17/10/201	N5 09 54.6	006 28 12.6	129097.75	445583.95
P 72	17/10/201	N5 09 54.2	006 28 12.2	129085.5	445571.59
P 73	17/10/201	N5 09 53.9	006 28 12.2	129076.28	445571.56
P 74	17/10/201	N5 09 53.8	006 28 11.9	129073.24	445562.31
P 75	17/10/201	N5 09 53.3	006 28 11.4	129057.92	445546.86
P 76	17/10/201	N5 09 52.9	006 28 11.2	129045.65	445540.65
P 77	17/10/201	N5 09 54.9	006 28 13.4	129106.89	445608.63
P 78	17/10/201	N5 09 55.1	006 28 13.2	129113.06	445602.49
P 79	17/10/201	N5 09 55.5	006 28 12.9	129125.38	445593.29
P 80	17/10/201	N5 09 56.1	006 28 12.8	129143.83	445590.26
P 81	17/10/201	N5 09 55.6	006 28 11.7	129128.57	445556.32
P 82	17/10/201	N5 09 54.8	006 28 11.1	129104.05	445537.76
P 83	17/10/201	N5 09 54.2	006 28 10.5	129085.67	445519.22
P 84	17/10/201	N5 09 53.9	006 28 10.1	129076.49	445506.86
P 85	17/10/201	N5 09 53.6	006 28 10.2	129067.26	445509.91
P 86	17/10/201	N5 09 53.6	006 28 10.4	129067.24	445516.08
P 87	17/10/201	N5 09 54.0	006 28 11.0	129079.47	445534.6


 Njeleruh, G.
 19/10/2011

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0126726993

b. Computation of volume of infiltrated oil in the soil (V_{inf}).

- i. Area (m^2) covered by the oil: 5380 m^2
- 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: 0.004 m
- iv. Soil type: CLAY
- v. P_e (effective porosity of the soil): 8%

iv. Volume of infiltrated oil. V_{inf}	10.82.	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: _____
- ii. Table of average depth of oil on water based on coloration *

	Thickness (mm)	Percentage coverage	Volume (m3)
Barely Visible	0.00004	NOT	
Silvery	0.00008		
Slight Color	0.00015		
Bright Color	0.0003		
Dull	0.001	APPLICABLE	
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}	51.86	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 $V_{Est}(bbls) = V_{evap}(bbls) + V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recJ}(bbls)$
 $51.86 + NIL + 10.82 + 283.05 + NIL = 345.73 \text{ barrels}$

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$V_{Est}(bbls) = 51.86 + NIL + 10.82 + 283.05 + NIL = 345.75 \text{ BARRELS}$
24. Net Total Estimated Spilled Volume (M3) (bbls) = $V_{oil}(bbls) + 0.6 * V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recl}(bbls)$
$V_{Est}(bbls) = 51.86 + NIL + 10.82 + 283.05 + NIL = 345.75 \text{ BARRELS}$

*Calculation of the respective estimated volume is done using the new spill estimation software on site

*Conversion of m3 to barrels is Total volume $V_T(m^3) \times 6.29$

*Emulsification factor for spill on water to consider % 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>17th / 10 / 2011</u> at incident site by joint investigation representatives from
<ul style="list-style-type: none"> • Host Community <input checked="" type="checkbox"/> • Department of Petroleum Resources [DPR]: <input checked="" type="checkbox"/> • National Oil Spill Detection and Response Agency [NOSDRA]: <input checked="" type="checkbox"/> • State Ministry of Environment [SME]: <input checked="" type="checkbox"/> • Nigeria Police Force [NPF]: <input checked="" type="checkbox"/> • Shell Petroleum Development Company [SPDC]: <input checked="" type="checkbox"/>
<i>Tick as applicable</i>

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20. Appendix 1: Overview sketch of the site

