

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0504

(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: 874523 2. Type of incident \* OIL SPILL  
 3. Name of Location 12 INCH AFIESERE - ERIEMU DELIVERY LINE  
 4. Name of nearest community AFIESERE 5. State: DELTA 6. LGA UGHELLI-NORTH  
 7. Type of Production facility/Installation DELIVERY LINE 8. Asset owner/ District PIPELINE

**B. INCIDENT INFORMATION:**

**9. Details of incident**

- a. Date of incident: 29/09/2012  
 b. Start date/time of investigation: 1/10/2012 AT 1425 HRS  
 c. Investigation End date: 2/10/2012  
 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) OUTWARD TEAR

- f. Incident caused by:  
 Third party interference  Operational  Mystery \_\_\_\_\_

g. Spill point coordinates

Measuring unit	
Northing:  <u>170932</u>	Easting:  <u>399022</u>

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

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0504 874523

**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 [ 30 ,m]
- Fish Farm/Pond [      ,m]
- Fishing net [      ,m]
- Others (specify). [      ,m]

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:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**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

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

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0504 874523

16. Crops/Economic Trees

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

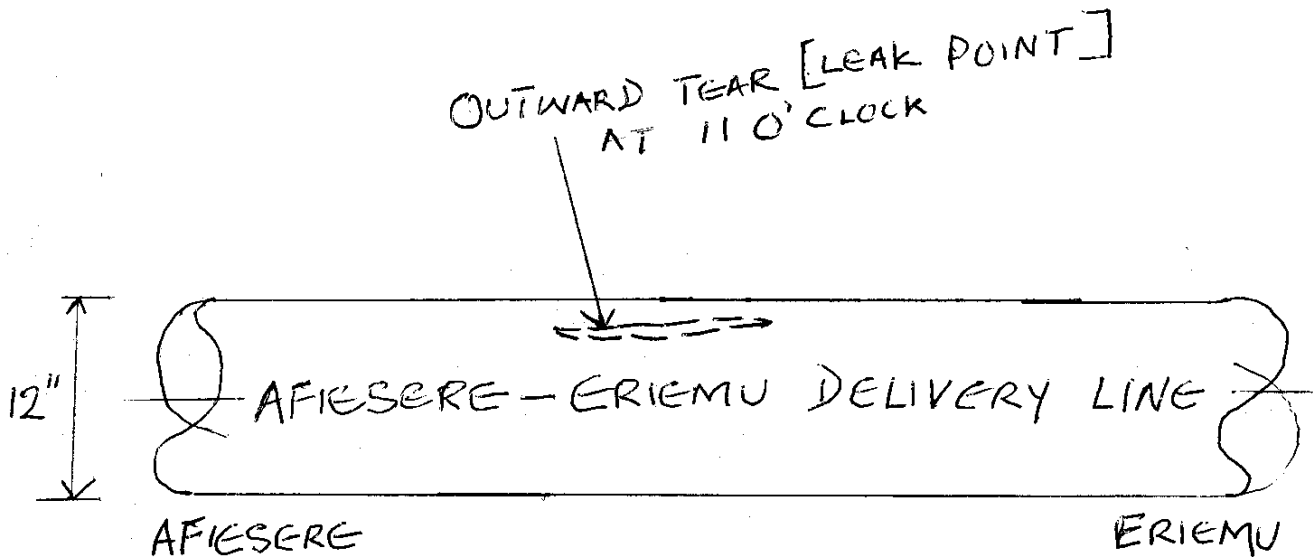
17. Fish/Nets/Ponds

S/N	Fish/Nets/Ponds	Description	Quantity/Size	Comments
1	FISH	DEAD	LOT	/
2	POND	MAN MADE	3	
/	/	/	/	

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

S/N	Others	Description	Quantity/Size	Comments
1	BIRD (DEAD)	/	1	/
/	/	/	/	/

**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)



THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: \_\_\_\_\_

0504 874523

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)

S/N	Northing	Easting
SP	170932	399022
1	170941	399007
2	170955	399006
3	170969	398983
4	170972	398987
5	170960	399997
6	170963	399001
7	170974	398988
8	170974	398982
9	170979	398981
10	170990	398972
11	170992	398975
12	170973	398991

G. INCIDENT INFORMATION:

20. Impacted Area Details

- Total calculated area of impact 7425m<sup>2</sup>
- Impact within SPDC R.O.W 2259.5
- Impact outside R.O.W 5165.5m<sup>2</sup>

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

Recovered oil $V_{rec.}$	NIL	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<sup>2</sup>) occupied by pool of free phase oil 5165.5m<sup>2</sup>
  - Average Depth (m) of pool of free phase oil 0.001m

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

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0504 874523

iii. Emulsification factor: 60%

iv. 

Volume of pool of free phase oil. $V_{pool}$ :	12.99	barrels
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- b. Computation of volume of infiltrated oil in the soil ( $V_{inf}$ ).
- i Area \*(m<sup>2</sup>) covered by the oil: 2259.5 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: 0.01m
  - iv Soil type: CLAY
  - v  $P_c$  (effective porosity of the soil). 8%
- iv. 

Volume of infiltrated oil. $V_{inf}$	11.37	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		
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 m<sup>3</sup></u>

NOT APPLICABLE

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. $V_{evap}$ :	4.30	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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JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0504 874523

**23. Gross Total Estimated Spilled Volume**

$$V_{Est}(bbls) = V_{evap}(bbls) + V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recf}(bbls)$$

$V_{Est}(bbls) = 28.66$  BBLs

**24. Net Total Estimated Spilled Volume**

$$V_{Est}(bbls) = V_{evap}(bbls) + 0.6 * V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recf}(bbls)$$

$V_{Est}(bbls) = 29$  BBLs

\*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

B. Investigation of the incident site showed that there is residual impact on site requiring further works

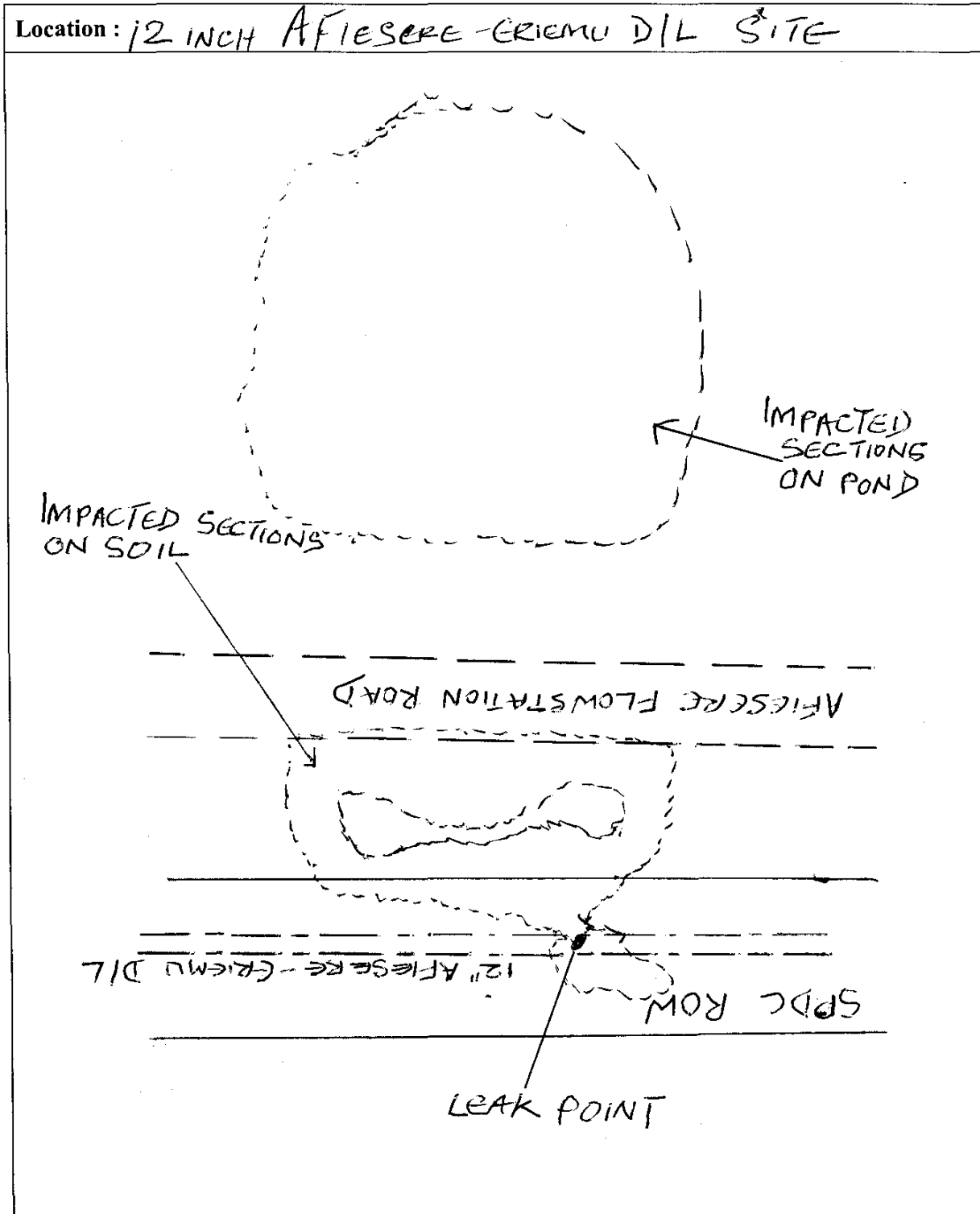
**26 REPRESENTATIVES**

This report was filled and signed on the 2/10/2012 at incident site by joint investigation representatives 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*

27. Appendix 1: Overview sketch of the site



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JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0504 874523

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

S/N	Northing	Easting
13	170950	399007
14	170934	399019
15	170899	399030
16	170897	399041
17	170883	399053
18	170904	399040
19	170918	399034
20	170917	399054
21	170903	399075
22	170943	399037
23	170955	399034
24	170964	399040
25	170971	399037
26	170981	399035
27	170993	399047
28	171022	399081
29	171029	398964
30	171027	398953