

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0315

(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: 846480 2. Type of incident * OIL SPILL
 3. Name of Location 12 INCH AFICERE - ERIEMU DELIVERY LINE
 4. Name of nearest community EMERAGHA 5. State: DELTA 6. LGA UGHELLI NORTH
 7. Type of Production facility/Installation DELIVERY 8. Asset owner/ District PIPELINE

B. INCIDENT INFORMATION:

9. Details of incident

- a. Date of incident: 28/7/2012
 b. Start date/time of investigation: 31/7/2012 AT 1400HRS
 c. Investigation End date: 01/08/2012 AT 1335 HRS
 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	
Northing: <div style="font-size: 2em; text-align: center;">169865m</div>	Easting: <div style="font-size: 2em; text-align: center;">400857m</div>

*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 (CASSAVA) [0 ,m]
 Fish Farm/Pond [0 ,m]
 Fishing net [,m]
 Others (specify). [,m]

12. Containment measures put in place;

- Booms Trench Dyke

Others: _____

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

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

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

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16. Crops/Economic Trees

S/N	Type of crops	Young	Medium	Matured	Quantity	Comments
1	RUBBER	/	YES	/	LOT	/
2	PALM TREE	/	/	YES	LOT	/
	/	/	/	/	/	/

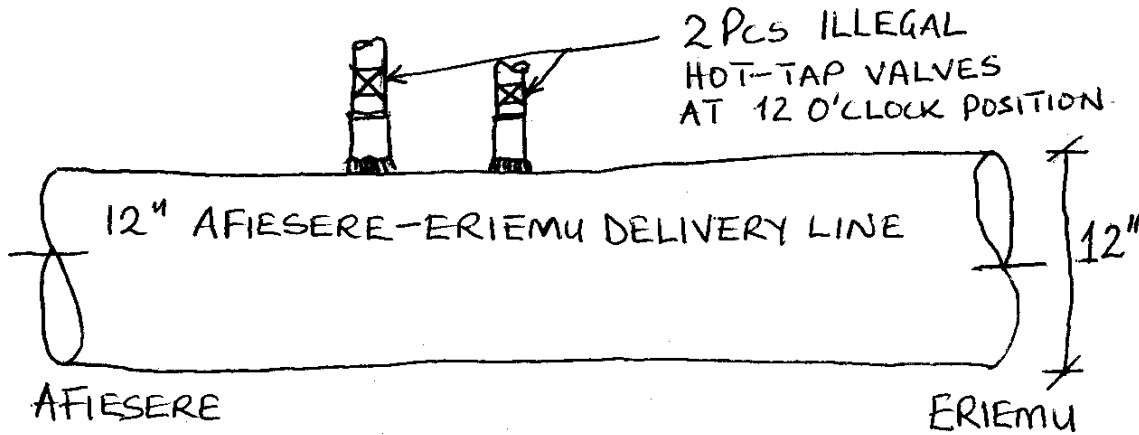
17. Fish/Nets/Ponds

S/N	Fish/Nets/Ponds	Description	Quantity/Size	Comments
1	NET	/	01	/
2	FISH	/	01	/
1	/	/	/	/

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)



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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)

S/N	Northing	Easting
SP	169865	400857
1	169884	400960
2	169897	400958
3	169915	400962
4	169916	400965
5	169905	400969
6	169905	400970
7	169916	400974
8	169914	400981
9	169910	400982
10	169909	400983
11	169917	400984
12	169920	400987

G. INCIDENT INFORMATION:

20. Impacted Area Details

- Total calculated area of impact 19594 m²
- Impact within SPDC R.O.W 4014 m²
- Impact outside R.O.W 15,580 m²

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 (m²) occupied by pool of free phase oil 18614 m²
 - Average Depth (m) of pool of free phase oil 0.003 m

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iii. Emulsification factor: 60%

iv.

Volume of pool of free phase oil. V_{pool} :	<u>140.48</u>	barrels
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b. Computation of volume of infiltrated oil in the soil (V_{inf}).

- i Area *(m²) covered by the oil: 979.70 m²
- 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: 0.10m
- iv Soil type: CLAY
- v P_c (effective porosity of the soil): 8%

iv.

Volume of infiltrated oil. V_{inf}	<u>49.29</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		
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
			bbl

NOT APPLICABLE

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>33.49</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%

*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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23. Gross Total Estimated Spilled Volume	
$V_{Est} (bbls) = V_{evap} (bbls) + V_{wat} (bbls) + V_{inf} (bbls) + V_{pool} (bbls) + V_{recj} (bbls)$	
$V_{Est} (bbls) =$	<u>223.3 BBLs</u>
24. Net Total Estimated Spilled Volume	
$V_{Est} (bbls) = V_{evap} (bbls) + 0.6 * V_{wat} (bbls) + V_{inf} (bbls) + V_{pool} (bbls) + V_{recj} (bbls)$	
$V_{Est} (bbls) =$	<u>223.3 BBLs</u>

*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.

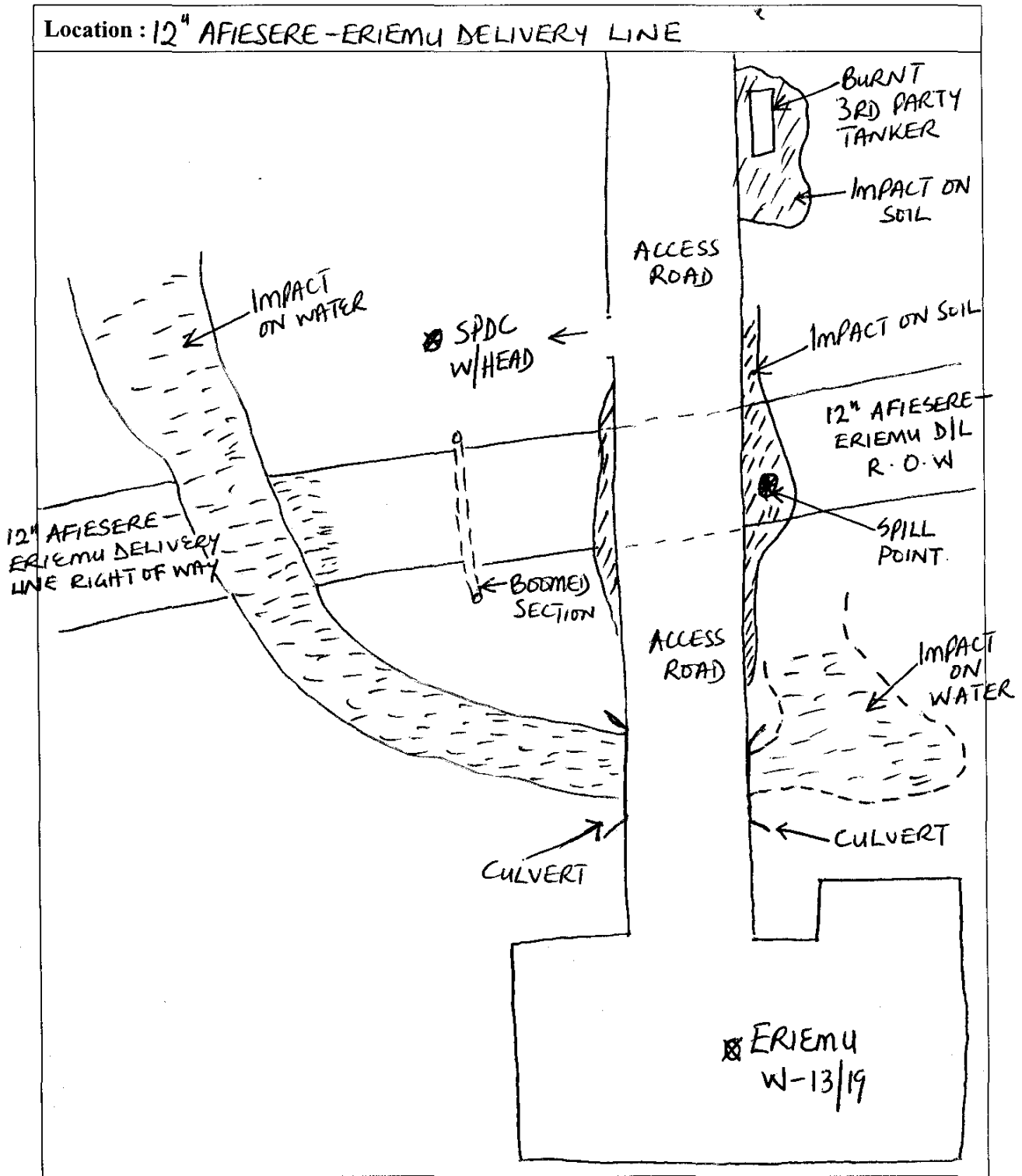
25. GENERAL STATUS OF THE SITE

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>28/9/2012</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 type="checkbox"/> • National Oil Spill Detection and Response Agency [NOSDRA]: <input checked="" type="checkbox"/> • State Ministry of Environment [SME]: <input type="checkbox"/> • Nigeria Police Force [NPF]: <input checked="" type="checkbox"/> • Shell Petroleum Development Company [SPDC]: <input checked="" type="checkbox"/>
<i>Tick as applicable</i>

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

S/N	Northing	Easting
13	169931	400998
14	169935	401000
15	169934	401004
16	169930	401002
17	169928	401009
18	169923	401015
19	169855	400829
20	169858	400841
21	169856	400830
22	169861	400849
23	169856	400849
24	169866	400876
25	169860	400875
26	169861	400884
27	169867	400884
28	169852	400414
29	169844	400431
30	169842	400391