

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0109 713692

(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: 713692 2. Type of incident* OIL SPILL
 3. Name of Location AKASO WELL 10 S FLOWLINE
 4. Name of nearest community MBIAMA 5. State: RIVERS 6. LGA ASARI-TORU
 7. Type of Production facility/Installation FLOWLINE 8. Asset owner/District NESI/ CANTHORNE CHANNEL

B. INCIDENT INFORMATION:

9. Details of incident

- a. Date of incident: 13 TH SEPTEMBER, 2011
 b. Date/Period of investigation: 16 TH 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: 1.) <u>58999.33m</u> <i>Pa</i> 2.) <u>58595.39m</u>	Easting: <u>507852.30m</u> <u>507854.58m</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 [,m]
 Farmlands [,m]
 Fish Farm/Pond [,m]
 Fishing net [,m]

Others (specify). NOT APPLICABLE

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:

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
<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
NONE WITHIN AREA OF IMPACT						

17. Fish/Nets/Ponds

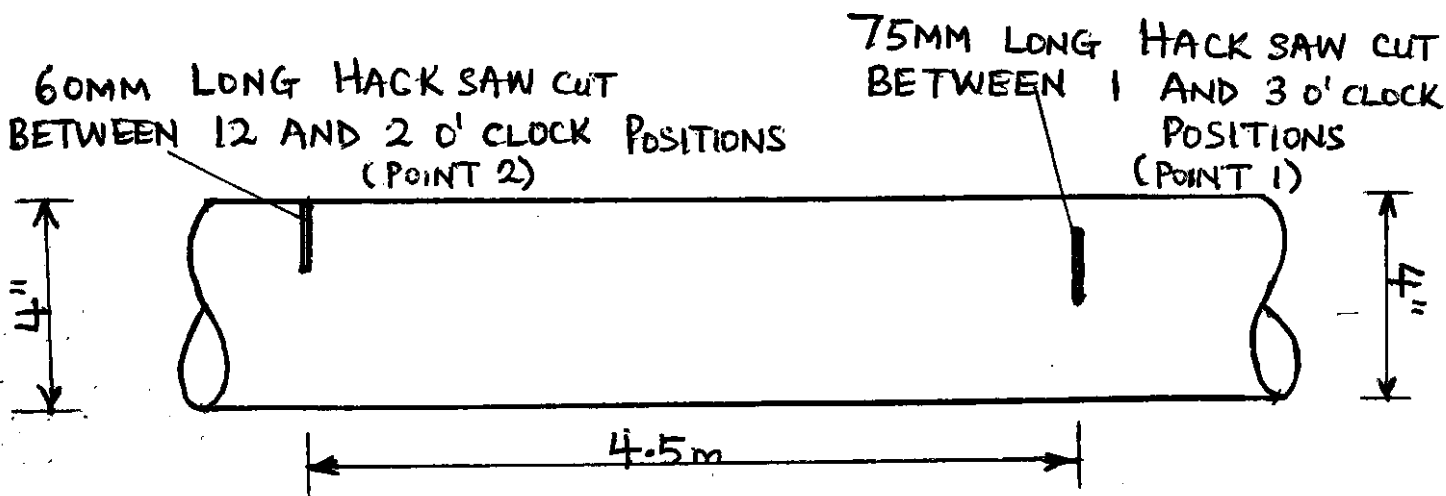
S/N	Fish/Nets/Ponds	Description	Quantity/Size	Comments
NONE WITHIN AREA OF IMPACT				

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)

SECTION OF AKASO WELL 10 S FLOWLINE SHOWING POSITIONS OF 2 NO. HACKSAW CUTS.



AKASO WELL 10

CAW THORNE CHANNEL I FLOW STATION.

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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)
	58603.04m	507841.54m
	58610.03m	507850.11m
	58593.84m	507860.27m
	58574.79m	507853.92m

G. INCIDENT INFORMATION:

20. Impacted Area Details

- Total calculated area of impact 0.03 Ha
- Impact within SPDC R.O.W 0.03 Ha
- Impact outside R.O.W NIL

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).
- i. Area (m²) occupied by pool of free phase oil 2
 - ii. Average Depth (m) of pool of free phase oil 0.001
 - iii. Emulsification factor: NIL

iv. Volume of pool of free phase oil. V _{pool} :	0.01	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: 298
- 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
- iv. Soil type: CLAY
- v. P_e (effective porosity of the soil): 8%

iv. Volume of infiltrated oil. V_{inf}	<u>0.60</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	NOT APPLICABLE	
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: 25%

iii. Volume of evaporated oil. V_{evap} :	<u>0.20</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 $V_{Est}(\text{bbls}) = V_{evap}(\text{bbls}) + V_{wat}(\text{bbls}) + V_{inf}(\text{bbls}) + V_{pool}(\text{bbls}) + V_{recd}(\text{bbls}) = 0.2 + \text{NIL} + 0.60 + 0.01 + \text{NIL} = 0.81$

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<u>V_{Est}(bbls)=</u>	0.81 BARREL
24. Net Total Estimated Spilled Volume $V_{Est}(bbls) = V_{evap}(bbls) + 0.6 * V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recj}(bbls) = 0.2 + NIL + 0.6 + 0.01 + NIL = 0.81$	
<u>V_{Est}(bbls)=</u>	0.81 BARREL

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

26 Signatories

This report was filled and signed on the 16 / 09 / 20 11 at incident site by joint investigation representatives from

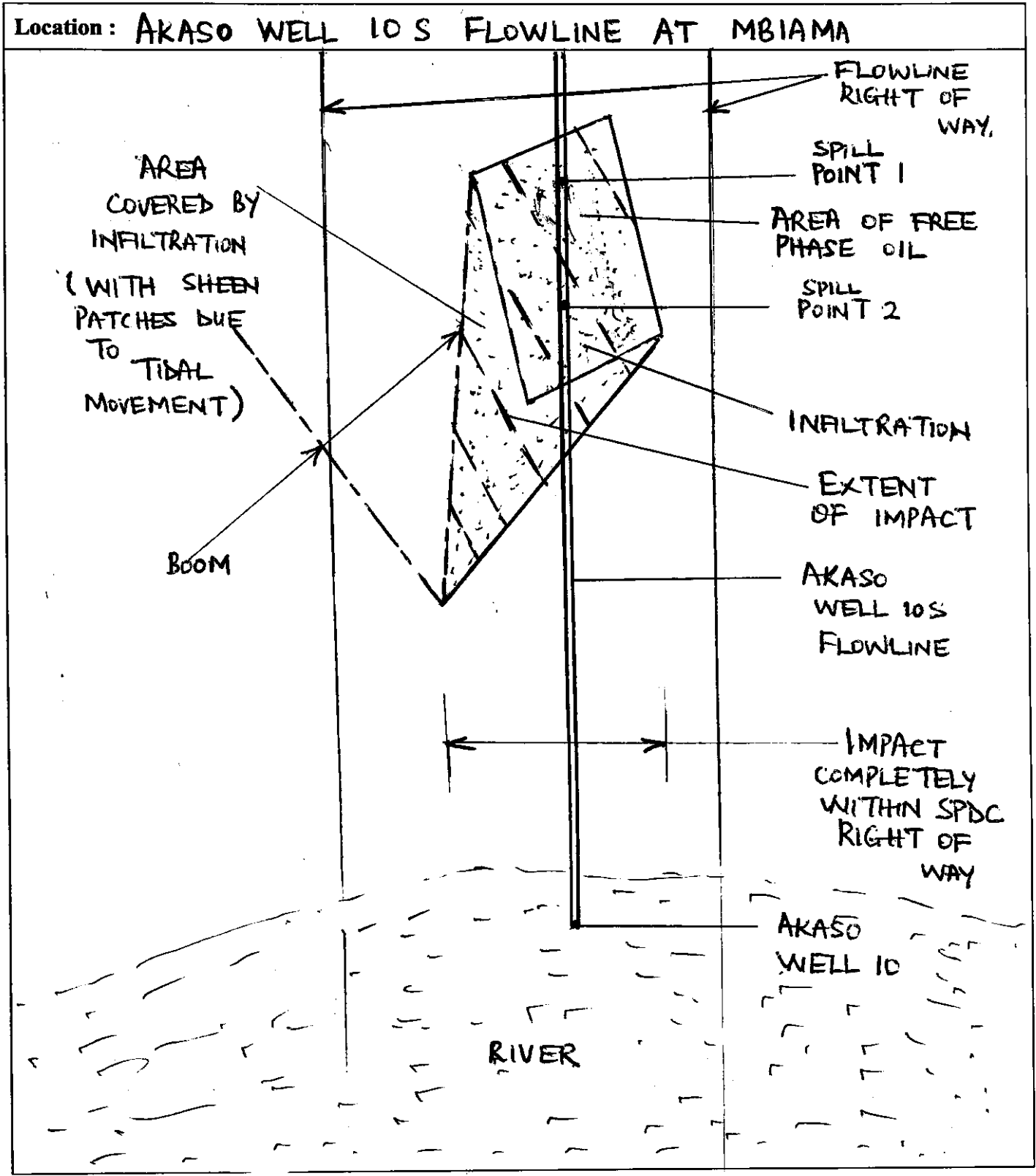
- Host Community
- Department of Petroleum Resources [DPR]:
- National Oil Spill Detection and Response Agency [NOSDRA]:
- State Ministry of Environment [SME]:
- Nigeria Police Force [NPF]:
- Shell Petroleum Development Company [SPDC]:

Tick as applicable

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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

S/N	Northing	Easting