

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0030 704074

(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: 704074 2. Type of incident* OIL SPILL
 3. Name of Location 12" ADIBAWA - OKORDIA PIPELINE
 4. Name of nearest community IKARAMA 5. State: BAYELSA 6. LGA YENAGOA
 7. Type of Production facility/Installation PIPELINE 8. Asset owner/District NESP/KOLO CREEK

B. INCIDENT INFORMATION:

9. Details of incident

- a. Date of incident: 21ST AUGUST, 2011
 b. Date/Period of investigation: 27TH AUGUST, 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: <u>129336.59</u>	Easting: <u>445849.68</u>

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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 [40 ,m]
 Fish Farm/Pond [,m]
 Fishing net [,m]
 Others (specify). [,m]

12. Containment measures put in place;

- Booms Trench Dyke

Others: NATURAL DEPRESSION

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

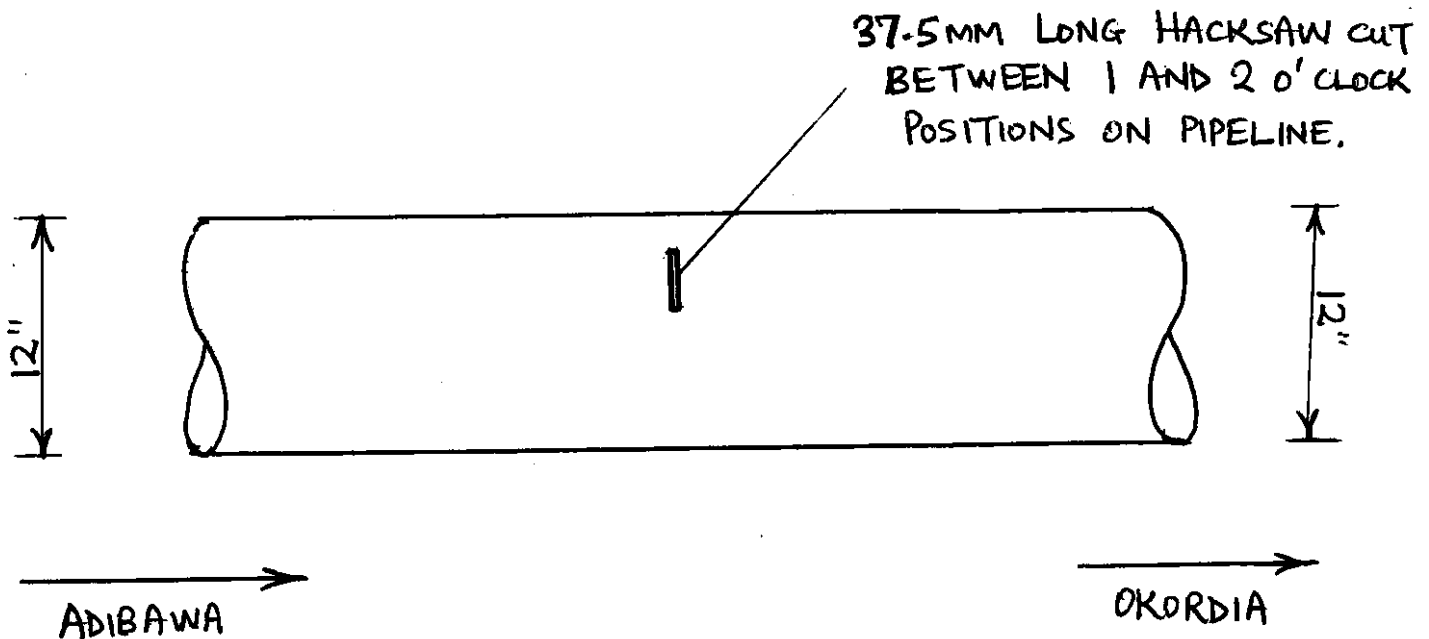
S/N	Fish/Nets/Ponds	Description	Quantity/Size	Comments
NONE WITHIN AREA OF IMPACT				

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



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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)
227	129286.43	445798.48
226	129295.56	445788.74
224	129344.86	445851.02
231	129369.21	445872.53
233	129367.23	445877.50
234	129364.14	445883.65
235	129361.08	445880.56
236	129351.87	445877.45
225	129327.82	445851.63

G. INCIDENT INFORMATION:

20. Impacted Area Details

- Total calculated area of impact 0.15 Ha
- Impact within SPDC R.O.W 0.12 Ha
- Impact outside R.O.W 0.03 Ha

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 (m^2) occupied by pool of free phase oil 969
- ii. Average Depth (m) of pool of free phase oil 0.01
- iii. Emulsification factor: NIL

iv. Volume of pool of free phase oil. V_{pool} :	60.95	barrels
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b. Computation of volume of infiltrated oil in the soil (V_{inf}).

RESIDUAL
VOLUME OF
SPILL FROM A
PREVIOUS INCIDENT
CLOSE TO THE
PRESENT INCIDENT

- i. Area (m^2) covered by the oil: 569
- 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: 0.021
- iv. Soil type: CLAY
- v. P_e (effective porosity of the soil): 8%

iv. Volume of infiltrated oil. V_{inf}	6.01	barrels
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21. Computation of volume of oil on open water based on standard coloration.

LOCATION
WHICH

- i. Total area of oil on open water: NIL
- ii. Table of average depth of oil on water based on coloration *

ACCUMULATED
INTO THE
PRESENT
SPILL
VOLUME
= 1.89
BARRELS
(AFTER A
SIGNIFICANT
VOLUME
WAS BURNT BY

	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		
Dark	0.002	APPLICABLE	
Blackoil	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:

THUS, 1.89
BARRELS
IS HEREBY
SUBTRACTED FROM
THE TOTAL
CUMULATIVE NET

- i. Oil type: BONNY MEDIUM
- ii. E-Factor: 15%

iii. Volume of evaporated oil. V_{evap} :	11.82	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) = $11.82 + NIL + 6.01 + 60.95 + NIL = 78.78$
 $78.78 - 1.89 = 76.89$

VOLUME
OF
78.78
BARRELS
TO ARRIVE
AT THE
NET
VOLUME
FOR THE
PRESENT
SPILL
INCIDENT.

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$V_{Est}(bbls)=$	76.9 BARRELS.
24. Net Total Estimated Spilled Volume $V_{Est}(bbls) = V_{cvap}(bbls) + 0.6*V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recJ}(bbls) = 11.82 + NIL + 6.01 + 60.95 + NIL = 78.78$	
$78.78 - 1.89 = 76.89$	
$V_{Est}(bbls)=$	76.9 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
- 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 27/08/2011 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

