

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0221802112

(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: 802112 2. Type of incident \* OIL SPILL  
 3. Name of Location 12" IMO-RIVER OCALE PIPELINE  
 4. Name of nearest community OWAZA 5. State: ABIA 6. LGA UKWA-WEST  
 7. Type of Production facility/Installation OIL PIPELINE 8. Asset owner/ District NESR/PH2

**B. INCIDENT INFORMATION:**

**9. Details of incident**

- a. Date of incident: 15<sup>TH</sup> APRIL 2012  
 b. Start date/time of investigation: 17<sup>TH</sup> APRIL 2012 11:45 HOURS  
 c. Investigation End date: 18<sup>TH</sup> APRIL 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) \_\_\_\_\_  
 f. Incident caused by:  
 Third party interference  Operational  Mystery \_\_\_\_\_

**g. Spill point coordinates**

Measuring unit		<u>MINNA MID BELT</u>	
Northing: <u>105288.21m</u>		Easting: <u>524794.73m</u>	

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

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0221802112

**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      [ Nil ,m]  
 Drinking water source      [ Nil ,m]  
 Built up area      [ Nil ,m]  
 Farmlands      [ Nil ,m]  
 Fish Farm/Pond      [ Nil ,m]  
 Fishing net      [ Nil ,m]  
 Others (specify).      [ Nil ,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:

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>				

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0221 802112

16. Crops/Economic Trees

S/N	Type of crops	Young	Medium	Matured	Quantity	Comments
1	CASSAVA		✓		10	
2	PALM TREES			✓	2	

17. Fish/Nets/Ponds

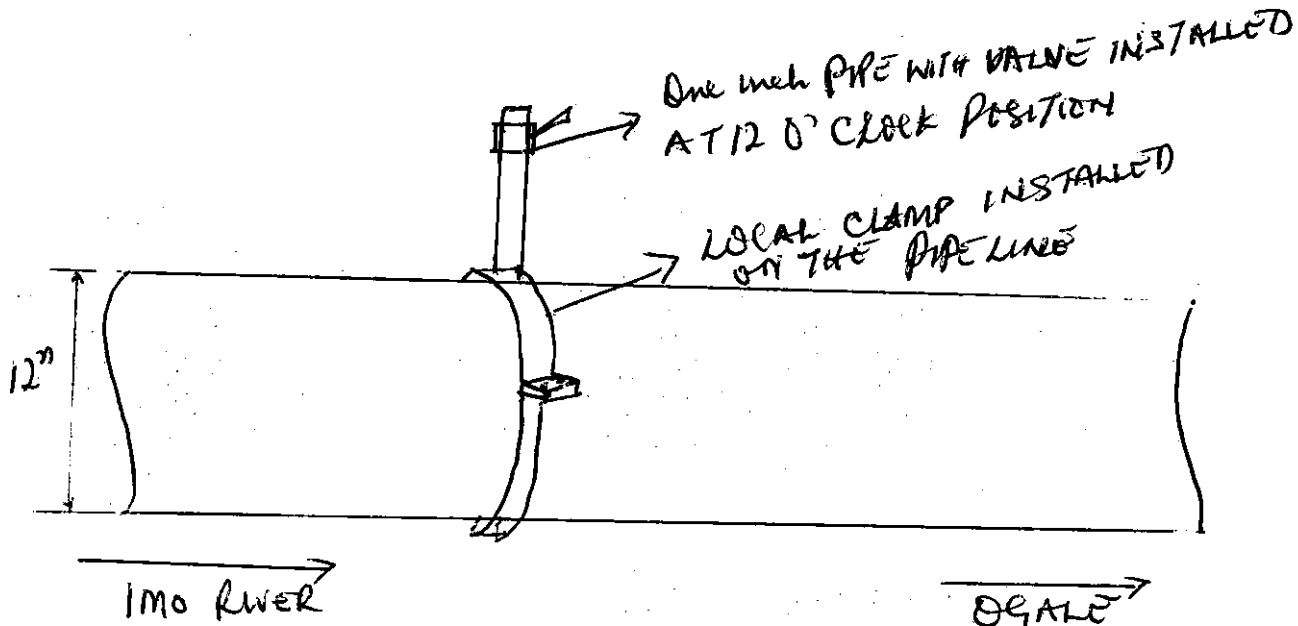
S/N	Fish/Nets/Ponds	Description	Quantity/Size	Comments
	NONE	WITHIN AREA OF IMPACT		

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 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)

A SECTION OF 12" IMO RIVER - OGARE PIPELINE AT OWAZA SHOWING ILLEGAL BUNKERING CONNECTION INSTALLED AT 12 O'CLOCK POSITION



THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0221802112

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
1	105365.00m	524797.97m
2	105352.71m	524801.02m
3	105331.20m	524804.06m
4	105334.27m	524807.15m
5	105321.97m	524813.29m
6	105272.82m	524810.11m
7	105266.67m	524813.18m
8	105266.67m	524816.26m
9	105192.96m	524806.87m
10	105190.62m	524806.20m
11	105185.63m	524805.15m
12	105180.68m	524803.76m
13	105183.77m	524794.53m

G. INCIDENT INFORMATION:

20. Impacted Area Details

- Total calculated area of impact 0.30Ha
- Impact within SPDC R.O.W YES
- Impact outside R.O.W YES

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

Recovered oil $V_{rec}$	<u>75</u>	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 ( $m^2$ ) occupied by pool of free phase oil 500  $m^2$
  - Average Depth (m) of pool of free phase oil 0.1m

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

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 802113

iii. Emulsification factor: NIL

iv. 

Volume of pool of free phase oil. $V_{pool}$ :	<u>314.5</u>	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: 1468

ii. Area of the pool of free phase oil in touch with soil: 500

iii. Average Depth (m) below ground surface of infiltration of oil: 0.03

iv. Soil type: CLAY

v.  $P_c$  (effective porosity of the soil): 8%

iv. 

Volume of infiltrated oil. $V_{inf}$	<u>29.71</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	
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. $V_{wat}$ :	<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>73.97</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)

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

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

0221 802112

**23. Gross Total Estimated Spilled Volume**

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

$$V_{Est}(bbls) = 73.97 + NL + 29.71 + 314.5 + 75 = 493.18 \text{ BARRELS}$$

**24. Net Total Estimated Spilled Volume**

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

$$V_{Est}(bbls) = 73.97 + NL + 29.71 + 314.5 + 75 = 493.2 \text{ BARRELS}$$

\*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

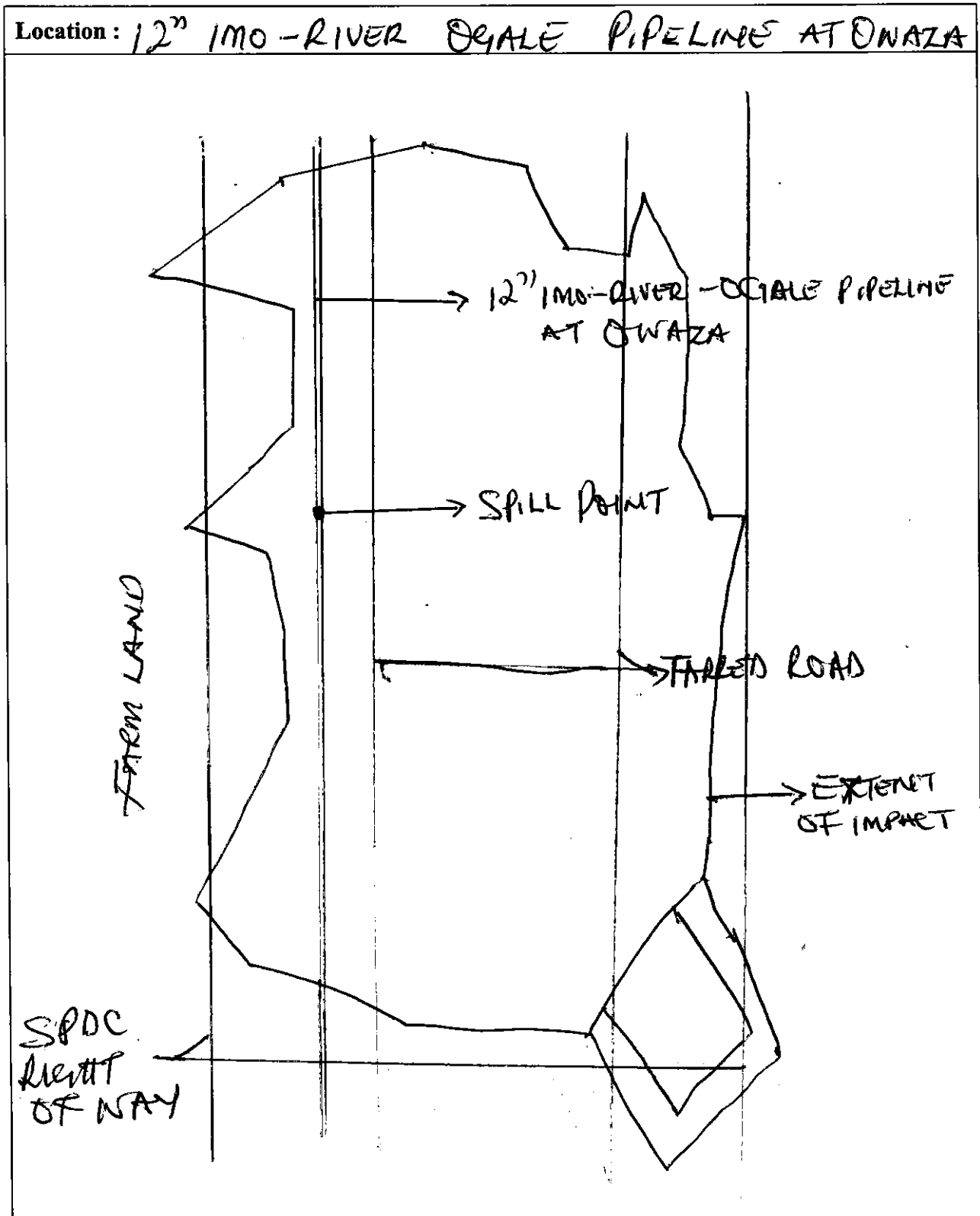
**26 REPRESENTATIVES**

This report was filled and signed on the 18/04/2012 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



THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0221 802712

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

MINNA MID BELT

S/N	Northing	Easting
14	105245.20m	524800.81m
15	105263.64m	524794.69m
16	105272.86m	524791.62m
17	105285.15m	524791.65m
18.	105291.29m	524791.66m
19.	105294.38m	524785.50m
20.	105297.45m	524782.43m
21	105312.79m	524791.70m
22	105334.29m	524794.83m
23.	105352.72m	524794.86m
24	105355.80m	524791.79m
25	105361.94m	524794.88m
LODP 2		
1	105192.96m	524806.87m
2	105177.58m	524822.24m
3	105162.22m	524819.13m
4	105149.95m	524812.94m
5	105162.25m	524803.73m

6.	105180.68m	524803.76m
7.	105185.63m	524805.15m
8.	105180.68m	524806.84m
9.	105162.24m	524809.89m
10.	105165.30m	524816.05m
11.	105180.03m	524819.22m
12.	105196.62m	524806.20m
13.	105192.96m	524806.86m