

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0526 905551

(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: 905551 2. Type of incident * OIL SPILL
 3. Name of Location 28" Nkpoku - Boma Pipeline
 4. Name of nearest community Kpoghor 5. State: RIVERS 6. LGA TAI
 7. Type of Production facility/Installation OIL PIPELINE 8. Asset owner/ District NLPE / PHA

B. INCIDENT INFORMATION:

9. Details of incident

- a. Date of incident: 15TH DECEMBER, 2012
 b. Start date/time of investigation: 20TH DECEMBER, 2012 / 11:42 AM
 c. Investigation End date: 20TH DECEMBER, 2012
 d. Description of spill point environment
☐ Firmed soil ☒ Loose soil ☒ Previously excavated area
☐ Under water ☐ Swampy ☐ Exposed pipe surface
☐ Well Plateform (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 (M)	
Northing: <u>79650.30</u>	Easting: <u>529031.02</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) _____

ii. Weather condition

☐ Raining ☒ Sunny

11. Distance from the nearest sensitive habitat

- ☐ Government reserved and designated protected area
- ☐ Drinking water source
- ☐ Built up area
- ☐ Farmlands
- ☐ Fish Farm/Pond
- ☐ Fishing net
- ☐ Others (specify).

[,m]
[,m]
[,m]
[,m]
[,m]
[,m]

NOT APPLICABLE

12. Containment measures put in place;

☐ Booms ☐ Trench ☐ Dyke

☒ Others: NATURAL DEPRESSION

13. Any pictures or video coverage?

☒ [N]

14. Was there any disruption to the investigation?

[Y] ☒

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

NONE WITHIN AREA OF IMPACT

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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

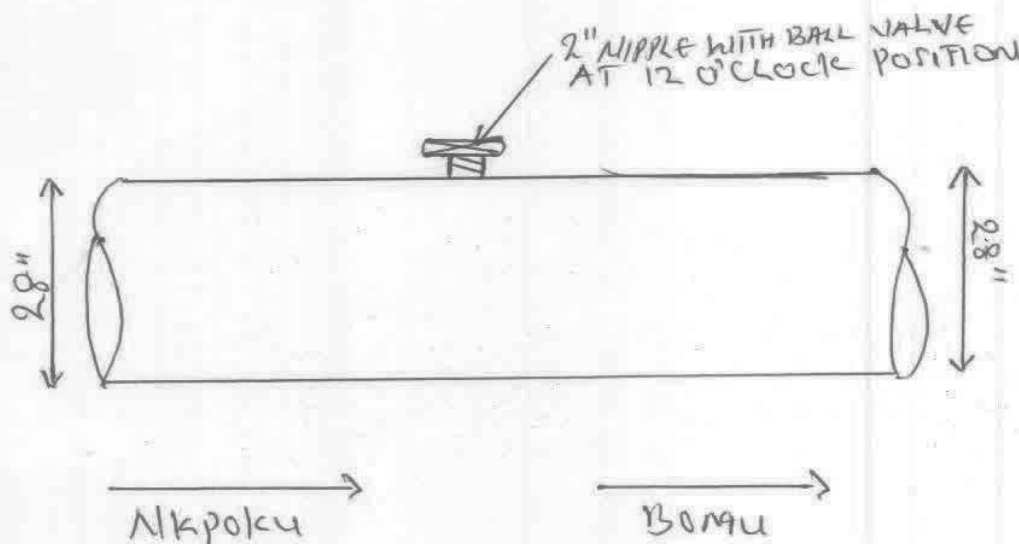
S/N	Fish/Nets/Ponds	Description	Quantity/Size	Comments
	NONE	WITHIN	AREA	OF IMPACT

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 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 28" NIKPOKU - BOMU PIPELINE AT KPOGITOK
SHOWING POSITION OF CRUDE OIL THEFT POINT AT 12 O'CLOCK
POSITIONAL.



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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)

M INN A MID-BELT

S/N	Northing (m)	Easting (m)
Wf226	79 649.42	529 037.85
Wf227	79 655.57	529 034.78
Wf228	79 652.49	529 037.86
Wf229	79 649.43	529 034.77
Wf230	79 649.44	529 025.52
Wf231	79 680.17	529 019.42
Wf232	79 677.09	529 025.58
Wf233	79 674.00	529 031.73
Wf234	79 670.94	529 028.65
Wf235	79 677.09	529 022.49
Wf236	79 667.88	529 022.48

G. INCIDENT INFORMATION:

20. Impacted Area Details

- Total calculated area of impact 0.01 Ha.
- 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>NIL</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).

- i. Area (m^2) occupied by pool of free phase oil NIL
- ii. Average Depth (m) of pool of free phase oil NIL

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iii. Emulsification factor: NIL

iv.

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

COMPUTATION OF
INFILTRATED OIL
AT SPILL POINT-
AREA = 1 m²
DEPTH = 1.2 m
SOIL POROSITY = 0.25
1 x 1.2 x 0.25 x 6.29
= 1.89 BARRELS

- i. Area \times (m²) covered by the oil: 99
ii. Area of the pool of free phase oil in touch with soil: —
iii. Average Depth (m) below ground surface of infiltration of oil: 0.008
iv. Soil type: SAND (MEDIUM)
v. P_e (effective porosity of the soil): 25%

INFILTRATED OIL
OUTSIDE SPILL POINT
= 1.25 BARRELS

Volume of infiltrated oil. V_{inf} 1.89 + 1.25 = 3.14 barrels

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

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>0.55</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%

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23. Gross Total Estimated Spilled Volume

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

$$V_{Est}(bbls) = 0.55 + NIL + 3.14 + NIL + NIL = 3.69 \text{ BARRELS}$$

24. Net Total Estimated Spilled Volume

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

$$V_{Est}(bbls) = 0.55 + NIL + 3.14 + NIL + NIL = 3.69 \approx 4 \text{ BARRELS}$$

*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 20/12/2012 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

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27. Appendix 1: Overview sketch of the site

