

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0535-906168

(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: 906168 2. Type of incident * OIL SPILL
 3. Name of Location 10" EKULAMA II SANBARTH PIPELINE
 4. Name of nearest community SANBARTH 5. State: RIVERS 6. LGA AKUKU TORU
 7. Type of Production facility/Installation PIPELINE 8. Asset owner/ District NESP/ Swamp

B. INCIDENT INFORMATION:

9. Details of incident

- a. Date of incident: 17TH DECEMBER, 2012
 b. Start date/time of investigation: 23RD TO 24TH DECEMBER, 2012, FIRST VISIT.
 c. Investigation End date: 6TH TO 8TH JANUARY, 2013, SECOND VISIT.
 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>METER</u> (<u>MINNA MID-BERT</u>)	
Northing: <div style="font-size: 2em; text-align: center;">56144.93</div>	Easting: <div style="font-size: 2em; text-align: center;">469469.12</div>

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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 [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

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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.			

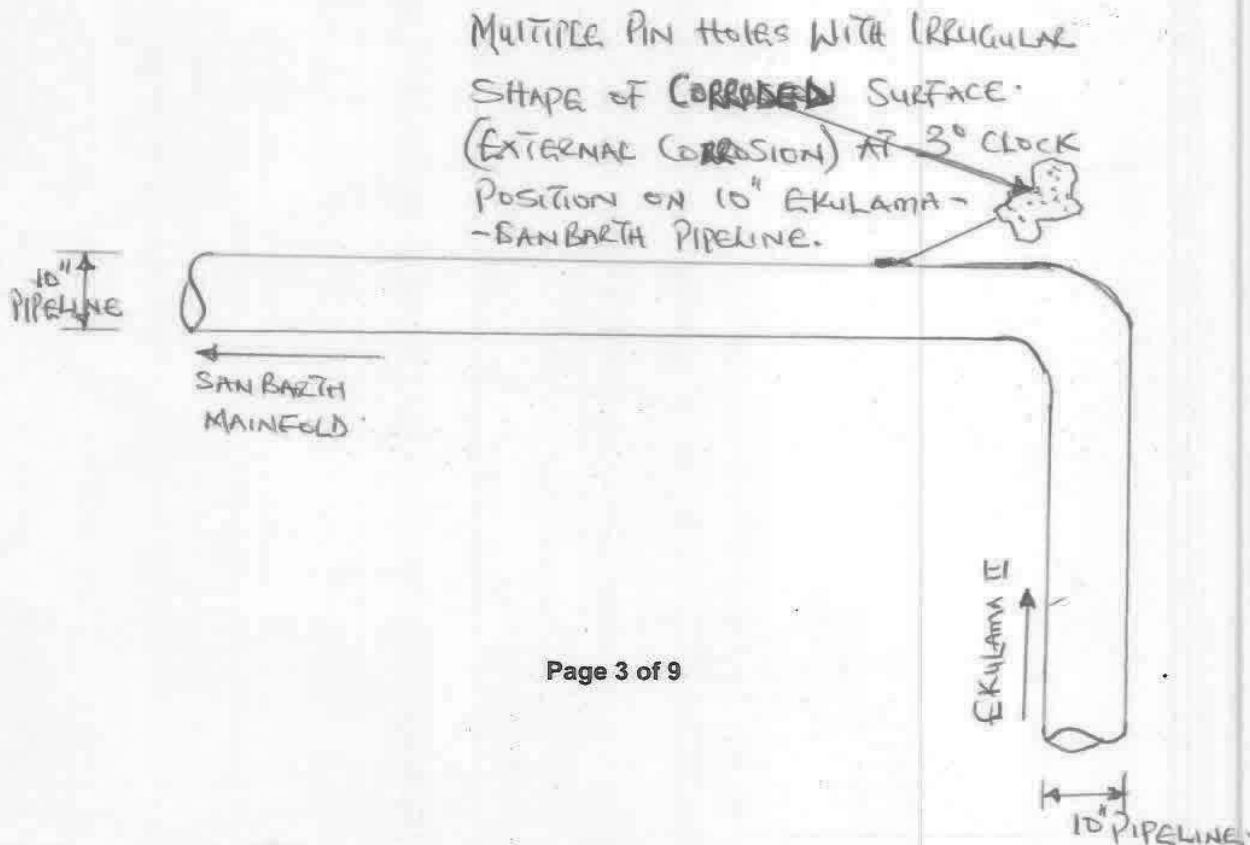
18. Others (Specify) i.e. Animal Traps

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)

SECTIONAL VIEW OF 10" EKULAMA II - SANBARTH PIPELINE AT SAN -

BARTH SHOWING CORROSION AS CAUSE



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19. Impacted area boundary Coordinates (If more than 12 points, Attach as an appendix 2)

[illegible]

20. Impacted Area Details

- Total calculated area of impact 1.46 Ha
- Impact within SPDC R.O.W _____
- Impact outside R.O.W _____

1.46 Ha

GROSS 8:32 BBL

Emulsification Factor

$$40^\circ / 10 = 4.99 \text{ BBL}$$
$$NET = 5 \text{ BBLs}$$

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

Recovered oil $V_{rec.I}$	5	barrels
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barrels

$$NET = 5 \text{ BBLs}$$

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 NOT
- ii. Average Depth (m) of pool of free phase oil APPLICABLE
(OIL RECOVERED)

~~NOT~~ APPLICABLE
(OIL RECOVERED)

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iii. Emulsification factor: NIL

iv.

Volume of pool of free phase oil. V_{pool} :

NOT APPLICABLE

barrels

b. Computation of volume of infiltrated oil in the soil (V_{inf}):

i Area (m^2) covered by the oil: 7300 m^2

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: 0.001 m

iv Soil type: CLAY

v P_e (effective porosity of the soil): 8%

iv. Volume of infiltrated oil. V_{inf}

3.67

barrels

21. Computation of volume of oil on open water based on standard coloration.

i. Total area of oil on open water: 0.73 = 7300 m^2

ii. Table of average depth of oil on water based on coloration**

	Thickness (mm)	Percentage coverage	Volume (m^3)
Barely Visible	0.00004		
Silvery	0.00008		
Slight Color	0.00015		
Bright Color	0.0003	<u>70</u>	
Dull	0.001	<u>30</u>	
Dark	0.002		
Black oil	0.1		
Emulsion (30% Oil)	1		
Percent Total		100%	Total Volume

bbl

iii.

Volume of oil on open water. V_{wat} :

0.02

barrels

22. Calculation of evaporated volume:

i. Oil type: BONNY LIGHT

ii. E-Factor: 25%

iii.

Volume of evaporated oil. V_{evap} :

3.23

barrels

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

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

$$V_{Est}(bbls) = 3.23 + 0.02 + 4.68 + NIL + 8.32 = 16.25 \text{ BARREL}$$

24. Net Total Estimated Spilled Volume

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

$$V_{Est}(bbls) = 3.23 + 0.02 + 4.68 + NIL + (8.32 \times 0.60 = 4.99) = 12.92 = 13 \text{ BARRELS}$$

*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 13 BARRELS

*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 08/01/2013 at incident site by joint investigation representatives from

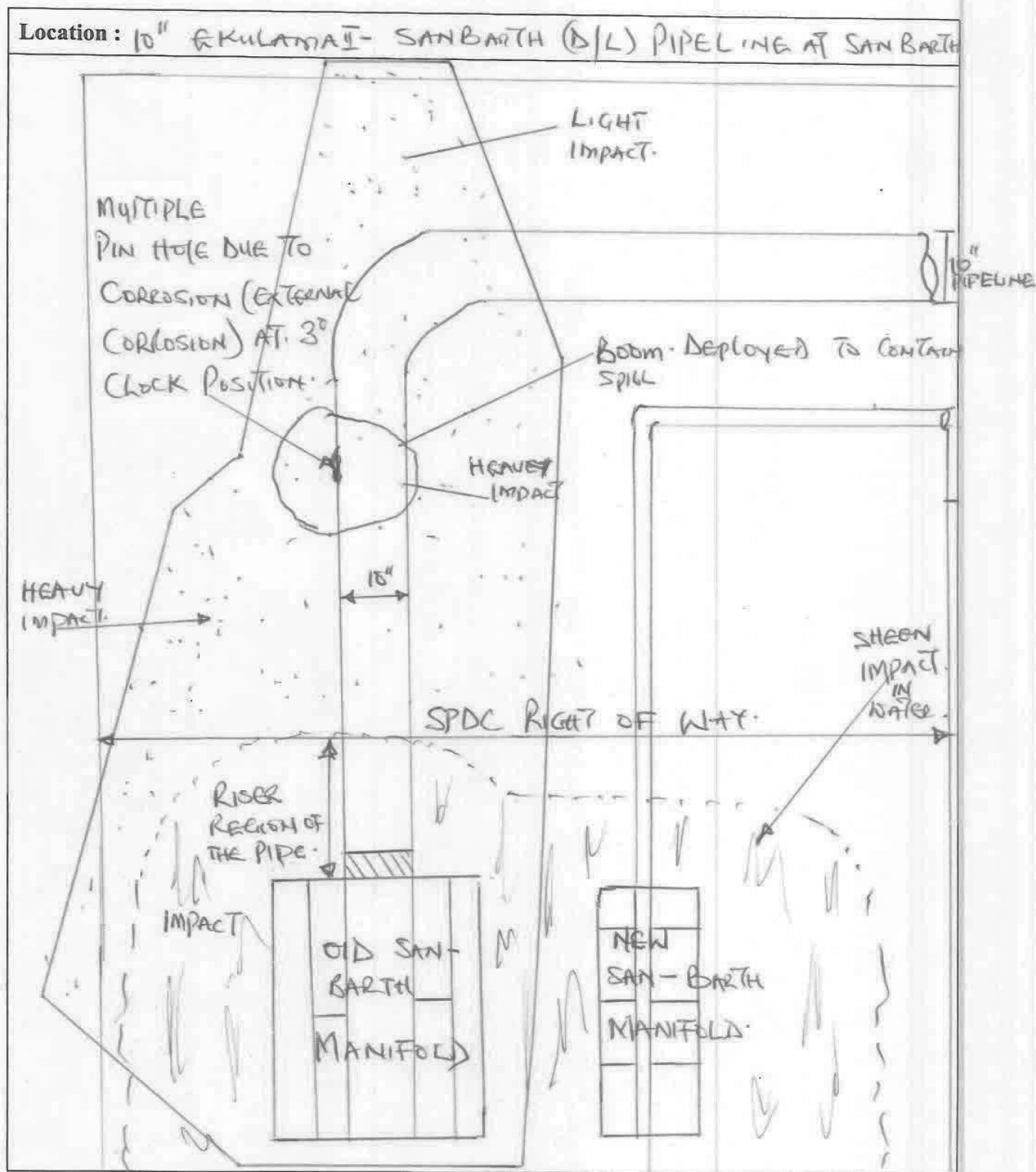
- Host Community ☒
- Department of Petroleum Resources [DPR]: ☒
- National Oil Spill Detection and Response Agency [NOSDRA]: ☒
- State Ministry of Environment [SME]: ☒
- Nigeria Police Force [NPF]: ☒
- Shell Petroleum Development Company [SPDC]: ☒

Tick as applicable

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27. Appendix 1: Overview sketch of the site



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

(MINNA MID-BETT)

S/N	Northing (METER)	Easting (METER)
	56148.60	469464.39
	56151.65	469473.65
	56139.38	469464.37
	56140.62	469473.68
	56166.99	469479.86 JR
	56143.33	469359.04
	56116.34	469362.22
	56117.83	469479.74
	56114.23	469692.49
	56144.98	469683.31
	56098.88	469586.06.