

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0140 | 793649

(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: 793649 2. Type of incident* OIL SPILL
 3. Name of Location 10" DIEBIA - CREEK - NUNRIVER PIPELINE
 4. Name of nearest community OPOROMA 5. State: BAYELSA 6. LGA SOUTHERN IJAW
 7. Type of Production facility/Installation PIPELINE 8. Asset owner/District UIG/P/NESP

B. INCIDENT INFORMATION:

9. Details of incident

- a. Date of incident: 26TH MARCH, 2012
 b. Date/Period of investigation: 1ST TO 2ND APRIL, 2012 AND 17TH TO 19TH APRIL 2012
ENDED ON THE 20TH APRIL 2012

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) EXTERNAL IMPACT FROM A HEAVY EQUIPMENT WITH AN EVIDENCE OF A TRACK OF DRAG ON THE PIPE.

e. Incident due to:

- Third party interference Operational Others (specify)

f. Spill point coordinates

Measuring unit (Meters) <u>(MINNA MID-BEIT)</u>	
Northing: <u>87870.16 Nm</u>	Easting: <u>405158.07 Nm</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) _____

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). [,m]

} 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:

THE DISAGREEMENT OVER THE CAUSE OF SPILL DUE TO MANUAL EXCAVATION OF THE SPILL POINT AREA IN THE FIRST JOINT INVESTIGATION OF 1ST TO 2ND APRIL 2012 WAS CLEARED, AS THE AREA WAS MECHANICALLY EXCAVATED ON THE SECOND VISIT OF 17TH TO 20TH APRIL, 2012.

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

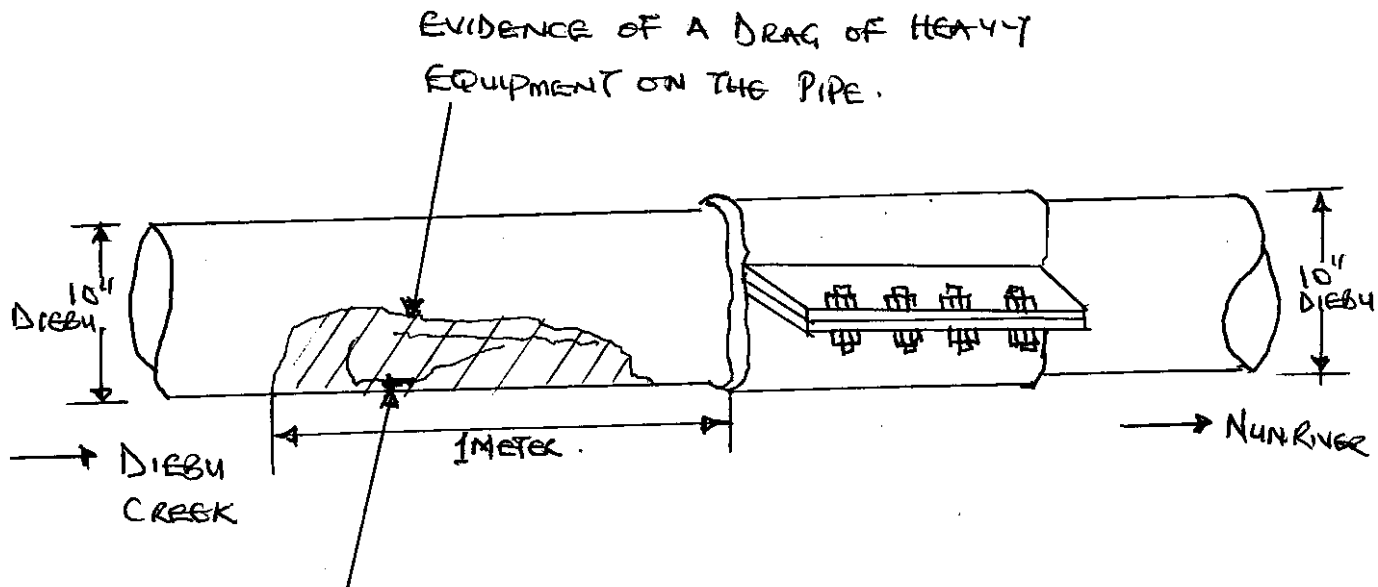
S/N	Fish/Nets/Ponds	Description	Quantity/Size	Comments
	NONE WITHIN AREA OF IMPACT			

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 (Overview sketch of the site should be added as an appendix.)

SECTIONAL VIEW OF THE 10" DIEBU CREEK - NUN RIVER PIPELINE AT OPOROMA.



10CM LONGITUDINAL TEAR AT 3⁰ CLOCK POSITION
 ON 10" DIEBU CREEK - NUN RIVER PIPELINE AT OPOROMA.

NOTE! TEAR OCCUR AT THE POINT WITH LOWEST THICKNESS DUE TO
 HEAVY EQUIPMENT DRAG ON THE PIPE.

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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-BET)

S/N	Northing (meter)	Easting (meter)
1.	87971.66m	405140.53m
2.	87965.35m	405186.75m
3.	87962.22m	405202.16m
4.	87891.41m	405235.83m
5.	87888.32m	405238.90m
6.	87872.95m	405238.85m
7.	87863.75m	405232.65m
8.	87842.28m	405220.24m
9.	87839.28m	405198.65m
10.	87830.11m	405186.28m
11.	87827.20m	405140.02m
12.	87858.04m	405109.29m
13.	87885.70m	405109.39m

G. INCIDENT INFORMATION:

20. Impacted Area Details

- Total calculated area of impact 1.51 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)
- Area (m^2) occupied by pool of free phase oil 2,102 m^2
 - Average Depth (m) of pool of free phase oil 0.507m
 - Emulsification factor: _____

iv. Volume of pool of free phase oil. V_{pool} :	<u>92.6</u>	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: 12,998 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: 0.002m
- iv. Soil type: CLAY
- v. P_e (effective porosity of the soil): 8%

iv. Volume of infiltrated oil. V_{inf}	13.1	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	APPLICABLE	
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} :	NIL	barrels
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22. Calculation of evaporated volume:

- i. Oil type: BONNY LIGHT
- ii. E-Factor: 40%

iii. Volume of evaporated oil. V_{evap} :	70.4	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 $V_{Est}(bbls) = V_{evap}(bbls) + V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{rec}(bbls)$
 $70.4 + NIL + 13.1 + 92.6 + NIL = 176.1 \text{ barrels}$

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$V_{Est}(bbls) = 70.4 + NIL + 13.1 + 92.6 + NIL = 176.1 \text{ BARRELS}$
24. Net Total Estimated Spilled Volume $V_{Est}(bbls) = V_{evap}(bbls) + 0.6 * V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{rec}(bbls)$
$V_{Est}(bbls) = 176 \text{ BARRELS}$

*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 <input type="checkbox"/>
B. Investigation of the incident site showed that there is residual impact on site requiring further works <input checked="" type="checkbox"/>

26 Signatories

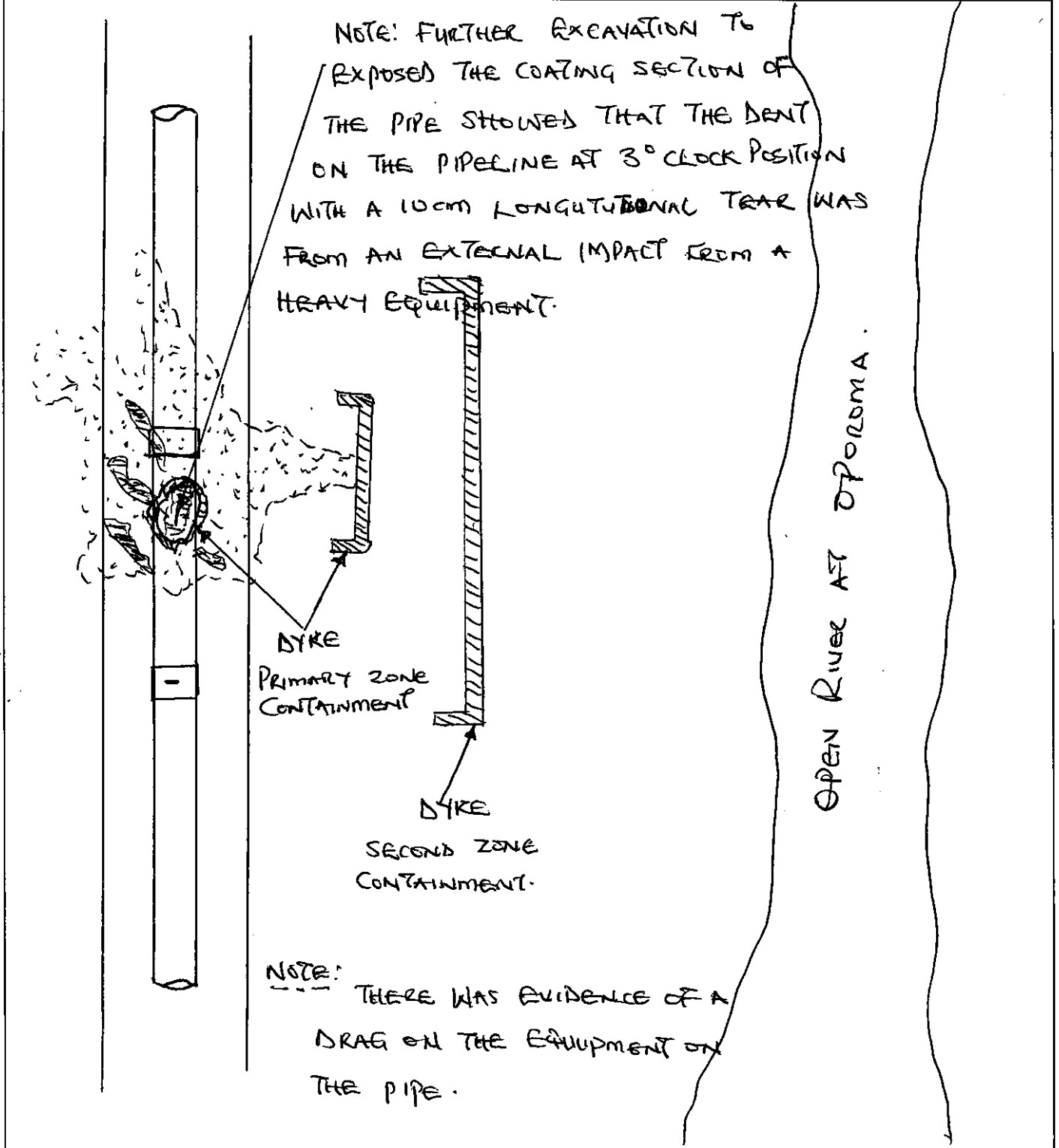
This report was filled and signed on the <u>19/04/2012</u> at incident site by joint investigation representatives from
<ul style="list-style-type: none">• Host Community <input checked="" type="checkbox"/>• Department of Petroleum Resources [DPR]: <input type="checkbox"/>• National Oil Spill Detection and Response Agency [NOSDRA]: <input checked="" type="checkbox"/>• State Ministry of Environment [SME]: <input checked="" type="checkbox"/>• Nigeria Police Force [NPF]: <input checked="" type="checkbox"/>• Shell Petroleum Development Company [SPDC]: <input checked="" type="checkbox"/>
<i>Tick as applicable</i>

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20. Appendix 1: Overview sketch of the site

Location: 10" DISBU CREEK - NUN RIVER PIPELINE AT OPOROMA.



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

(MINNA MID-BEIT)

S/N	Northing (meter)	Easting (meter)
14.	87888.86m	405084.73m
15.	87944.07m	405118.84m

RP9 19/04/2012