

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0196 777237

(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: 777237 2. Type of incident* OIL SPILL
 3. Name of Location 12" OGUTA - EGBEMA PIPELINE
 4. Name of nearest community OBLIAKPU 5. State: IMO 6. LGA EGBEMA
 7. Type of Production facility/Installation OIL PIPELINE 8. Asset owner/District NPE/EGBEMA

B. INCIDENT INFORMATION:

9. Details of incident

a. Date of incident: 14TH FEBRUARY, 2012

b. Date/Period of investigation: 19TH FEBRUARY, 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) _____

e. Incident due to:

- Third party interference Operational Others (specify) _____

f. Spill point coordinates

Measuring unit (METER) (MINNA MID-BELT)	
Northing:	Easting:
182038.99	477133.85 SW
174123.39	477938.90

*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
(STREAM) 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 [10 ,m]
 Fish Farm/Pond [,m]
 Fishing net [,m]
 Others (specify). [,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>					

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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

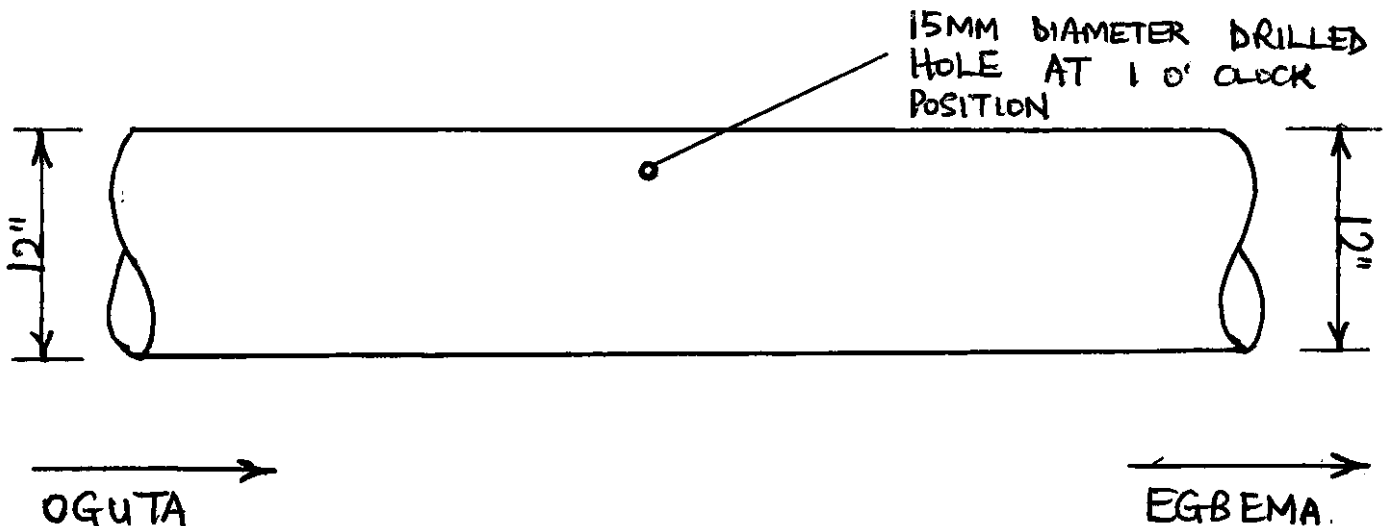
S/N	Fish/Nets/Ponds	Description	Quantity/Size	Comments
NONE WITHIN AREA OF IMPACT				

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" OGUTA - EGBEMA PIPELINE
 AT OBIAKPU SHOWING POSITION OF DRILLED
 HOLE.



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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)

S/N	Northing	Easting

SEE ATTACHED APPENDIX FOR IMPACTED AREA COORDINATES (3.49Ha)

G. INCIDENT INFORMATION:

20. Impacted Area Details

- Total calculated area of impact ~~9.2~~ AHE 3.49(Ha)
- Impact within SPDC R.O.W _____
- Impact outside R.O.W _____

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

Recovered oil V _{rec,F}	409.08	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 (m²) occupied by pool of free phase oil 34,151
 - ii. Average Depth (m) of pool of free phase oil 0.005
 - iii. Emulsification factor: NIL

iv. Volume of pool of free phase oil. V _{pool} :	1,074.05	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: 749
- ii. Area of the pool of free phase oil in touch with soil: 16
- iii. Average Depth (m) below ground surface of infiltration of oil: 0.03
- iv. Soil type: SAND - MEDIUM
- v. P_e (effective porosity of the soil): 25%

iv. Volume of infiltrated oil. V_{inf}	<u>36.09</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	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} :	<u>NIL</u>	barrels
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22. Calculation of evaporated volume:

- i. Oil type: BONNY LIGHT
- ii. E-Factor: 25%

iii. Volume of evaporated oil. V_{evap} :	<u>506.41</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%

23. Gross Total Estimated Spilled Volume $V_{Est}(\text{bbls}) = V_{evap}(\text{bbls}) + V_{wat}(\text{bbls}) + V_{inf}(\text{bbls}) + V_{pool}(\text{bbls}) + V_{rec}(\text{bbls}) = 506.41 + \text{NIL} + 36.09 + 1074.05 + 409.08 = 2,025.63$

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$V_{Est}(bbls)=$	2,025.6 BARRELS
24. Net Total Estimated Spilled Volume $V_{Est}(bbls) = V_{evap}(bbls) + 0.6*V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recl}(bbls) = 506.41 + ML + 36.09 + 1074.05 + 409.08 = 2,025.63$	
$V_{Est}(bbls)=$	2,025.6 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 19 / 02 / 20 12 at incident site by joint investigation representatives from

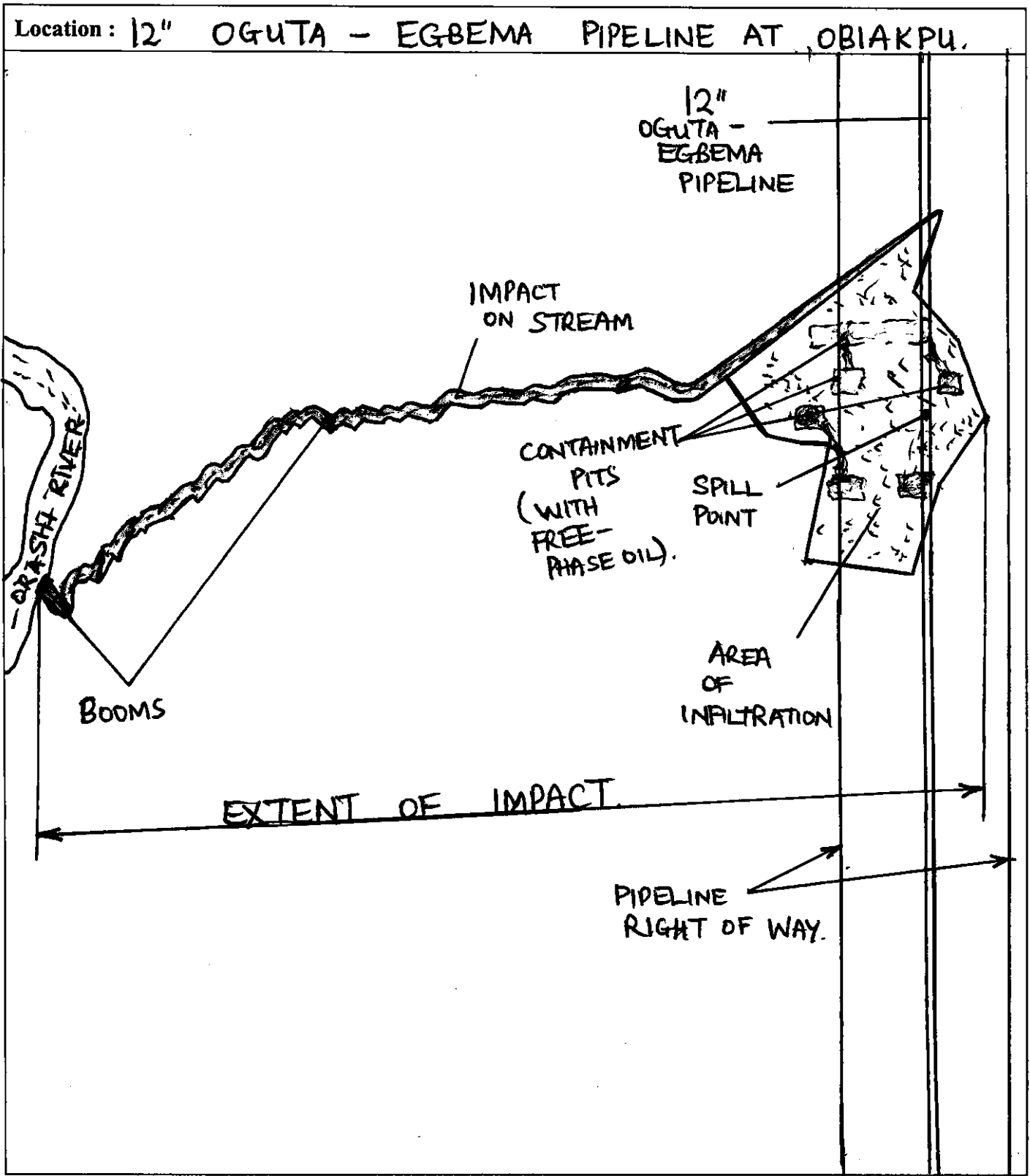
- Host Community
- Department of Petroleum Resources [DPR]:
- National Oil Spill Detection and Response Agency [NOSDRA]:
- State Ministry of Environment [SME]:
- Nigeria Police Force [NPF]:
- Shell Petroleum Development Company [SPDC]:

Tick as applicable

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20. Appendix 1: Overview sketch of the site



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

S/N	Northing	Easting

SEE ATTACHED APPENDIX FOR IMPACTED AREA COORDINATES
(3.494a)

APPENDIX

Impacted Area Coordinates

name	Minna Mid-Belt	
	Northing (meter)	Easting (meter)
p1	174142.68	477910.93
p2	174157.17	477945.15
p3	174147.96	477942.05
p4	174141.80	477948.19
p5	174129.49	477954.31
p6	174123.37	477948.13
p7	174114.17	477941.95
p8	174117.28	477929.64
p9	174132.63	477932.77
p10	174132.66	477923.53
p11	174137.94	477915.22
p12	174114.58	477871.37
p13	174116.33	477850.02
p14	174130.77	477823.19
p15	174127.12	477795.25
p16	174092.52	477757.79
p17	174090.74	477616.34
p18	174059.11	477539.27
p19	174082.77	477469.50
p20	174075.94	477425.52
p21	174096.74	477352.10
p22	174107.22	477273.52
p23	174070.54	477251.93
p24	174034.59	477210.81
p25	174076.50	477024.92
p26	174070.31	476982.69
p27	174087.29	476938.48
p28	174088.40	476864.10
p29	174134.55	476715.99
p30	174112.96	476672.97
p31	174105.03	476644.16
p32	174142.17	476597.01
p33	174140.11	476567.00
p34	174121.38	476549.86
p35	174114.71	476523.03
p36	174144.87	476426.43
p37	174135.82	476381.58
p38	174111.53	476369.04
p39	174109.47	476330.15
p40	174095.50	476318.56
p41	174103.76	476285.06
p42	174092.80	476241.56
p43	174032.98	476166.08
p44	173993.52	476105.52



APPENDIX

Impacted Area Coordinates

name	Minna Mid-Belt	
	Northing (meter)	Easting (meter)
p45	173982.88	476077.97
p46	173977.96	476051.78
p47	173956.47	475981.77
p48	173940.91	475888.90
p49	173939.48	475860.09
p50	173952.02	475788.25
p51	173947.74	475775.08
p52	173922.57	475750.23
p53	173852.96	475706.58
p54	173841.72	475682.92
p55	173817.91	475666.73
p56	173800.92	475622.76
p57	173809.50	475568.94
p58	173783.78	475512.58
p59	173794.26	475476.55
p60	173749.04	475440.43
p61	173741.90	475425.83
p62	173745.87	475390.42
p63	173736.66	475345.58
p64	173704.69	475278.98
p65	173701.04	475229.61
p66	173669.83	475188.81
p67	173671.89	475143.09
p68	173659.98	475089.91
p69	173621.34	475054.19
p70	173577.15	475042.13
p71	173545.48	475021.65
p72	173505.91	475014.08
p73	173484.80	474972.06
p74	173510.09	474935.66
p75	173505.86	474910.26
p76	173477.92	474890.31
p77	173447.64	474885.12
p78	173414.94	474867.87
p79	173394.46	474851.04
p80	173390.18	474832.15
p81	173376.11	474811.30
p82	173343.06	474821.24
p83	173318.31	474821.15
p84	173306.67	474815.43
p85	173298.47	474790.24
p86	173355.59	474748.86
p87	173361.07	474725.89
p88	173376.48	474728.81



APPENDIX

Impacted Area Coordinates

name	Minna Mid-Belt	
	Northing (meter)	Easting (meter)
p89	173364.74	474761.24
p90	173315.87	474792.69
p91	173320.63	474806.58
p92	173383.40	474799.70
p93	173399.54	474825.90
p94	173402.23	474845.21
p95	173420.09	474859.89
p96	173451.02	474878.81
p97	173488.23	474882.12
p98	173515.39	474903.35
p99	173524.97	474939.20
p100	173495.34	474971.28
p101	173515.44	475005.68
p102	173553.73	475013.35
p103	173583.31	475036.64
p104	173626.11	475047.35
p105	173666.80	475083.00
p106	173679.76	475144.92
p107	173677.52	475185.60
p108	173708.79	475224.49
p109	173712.02	475275.09
p110	173748.33	475339.52
p111	173756.93	475387.47
p112	173749.13	475422.40
p113	173755.61	475438.34
p114	173806.49	475468.64
p115	173792.60	475510.31
p116	173821.04	475564.08
p117	173809.79	475620.31
p118	173828.37	475659.80
p119	173849.80	475680.17
p120	173858.19	475700.94
p121	173931.75	475742.02
p122	173963.99	475775.16
p123	173962.80	475806.38
p124	173948.65	475860.35
p125	173951.56	475892.10
p126	173964.26	475979.35
p127	173991.13	476046.55
p128	174005.06	476096.96
p129	174016.49	476122.75
p130	174042.42	476164.95
p131	174099.80	476231.23
p132	174106.29	476250.22

APPENDIX

Impacted Area Coordinates

name	Minna Mid-Belt	
	Northing (meter)	Easting (meter)
p133	174115.07	476292.75
p134	174105.02	476315.17
p135	174117.45	476329.33
p136	174118.91	476364.19
p137	174144.92	476372.12
p138	174157.62	476422.92
p139	174120.84	476523.33
p140	174126.79	476546.35
p141	174146.24	476563.22
p142	174149.68	476602.51
p143	174110.48	476644.98
p144	174121.73	476674.08
p145	174142.36	476713.37
p146	174094.18	476869.21
p147	174092.20	476939.52
p148	174076.14	476983.84
p149	174085.00	477026.77
p150	174040.76	477204.24
p151	174043.94	477214.96
p152	174075.42	477249.09
p153	174116.38	477262.91
p154	174120.88	477278.65
p155	174103.68	477356.57
p156	174083.04	477425.50
p157	174090.45	477461.75
p158	174091.25	477476.56
p159	174083.70	477489.39
p160	174066.20	477541.05
p161	174096.89	477611.10
p162	174098.09	477755.76
p163	174133.88	477790.36
p164	174137.59	477825.68
p165	174124.09	477854.26
p166	174123.04	477871.12
p167	174142.68	477910.93

