

JOINT INVESTIGATION REPORT

INCIDENT NO: 1647374 JIV report S/N:

N^o 0000366

(Note: As practicable as possible the JIV report is to be signed in the field by all the participating parties)

A. GENERAL INFORMATION:

1. Spill incident Number: 1647374 2. Type of incident* OIL SPILL
3. Name of Location 48" FORCADOS EXPORT PIPELINE
4. Name of nearest community OGULAGHA/ODIMODI 5. State: DELTA 6. LGA BURUTU
7. Type of Production facility/Installation OIL PIPELINE
8. Asset owner-District THE SHELL PETROLEUM DEVELOPMENT COMPANY OF

B. INCIDENT INFORMATION: NIGERIA LIMITED / SWAMP WEST

9. Details of incident

- a. Date of incident: 3RD JUNE, 2016
b. Start date/time of investigation: 4TH JUNE, 2016 AT 1424HRS
c. Investigation End date: 14TH JULY, 2016 Actual investigation duration, days: 3 DAYS
d. Description of spill point environment

- | | | |
|---|--|--|
| <input type="checkbox"/> Firm soil | <input type="checkbox"/> Loose soil | <input type="checkbox"/> Recently excavated area |
| <input checked="" type="checkbox"/> Under water | <input checked="" type="checkbox"/> Swampy | <input type="checkbox"/> Exposed pipe surface |
| <input type="checkbox"/> Well Platform (on Water) | <input type="checkbox"/> Drill Rig | |

Additional observations around the spill point: INCIDENT CAUSE WAS CONFIRMED AS THIRD PARTY INTERFERENCE, ESTABLISHED ON EXCAVATION OF THE LEAK POINT. A MAJOR CONCAVE DEPRESSION AND PIPE BREACH (BETWEEN 9 O'CLOCK TO 3 O'CLOCK POSITIONS) DUE TO EXTERNAL IMPACT WAS OBSERVED ON THE PIPELINE.

e. Description of leak point (tick as applicable):

- | | | |
|---|--|--|
| <input type="checkbox"/> Drilled hole | <input type="checkbox"/> Hack saw cut | <input checked="" type="checkbox"/> Tear (_____) |
| <input type="checkbox"/> Complete Rupture | <input checked="" type="checkbox"/> Inward dent. | <input type="checkbox"/> Well head tampering |
| <input type="checkbox"/> Failed Weld-on illegal hot tap valve | <input type="checkbox"/> Failed Clamp. | <input type="checkbox"/> Missing Pipeline/Flowline |
| <input type="checkbox"/> Crude oil theft (illegal bunkering) point. | <input type="checkbox"/> Saver-pit over flow | <input type="checkbox"/> Third party tampering with Clamp |
| <input type="checkbox"/> Third party tampering with valve setting | <input type="checkbox"/> Bulging Outward | <input type="checkbox"/> Third party tampering with flange. |
| <input type="checkbox"/> Flare System/Bund wall failure | <input type="checkbox"/> Cold vent | <input type="checkbox"/> Surge vessel overflow. |
| <input type="checkbox"/> Valve Failure | <input type="checkbox"/> Relief valve failure | <input type="checkbox"/> Accidental 3 rd party equipment impact |
| <input type="checkbox"/> Others(specify) | | |

f. Incident caused by:

- Third party interference (Sabotage crude theft ; Line theft ; Accidental 3rd party damage
 Operational Others (including Mystery spills)

* This can be: a) Oil Spill b) Drilling fluid Chemical c) Situation d) Construction e) Environment f) Fire.

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g. Spill point coordinates

h. Measuring unit

WGS 84 (DECIMAL - DEGREE)

Northing:	Easting:
<u>5.310841</u>	<u>5.335781</u>
/	/

C. RISK ASSESSMENT

10. Type of environment:

- Land
 Swamp
 Water
 Seasonal swamp
 Shoreline/Waterfront

i. Type of environment to which oil has spread:

- Land
 Swamp
 Water
 River (identify) _____

ii. Weather condition

- Rain
 Sunny
 Dry
 Wet
 Windy
 Hot
 Cool

11. Distance from the nearest sensitive habitat

- | | | | | |
|--|--|-----|---|-----------------------------|
| <input type="checkbox"/> Government reserved and designated protected area | | .m] | } | NONE WITHIN
THE VICINITY |
| <input type="checkbox"/> Drinking water source | | .m] | | |
| <input type="checkbox"/> Built up area | | .m] | | |
| <input type="checkbox"/> Farmlands | | .m] | | |
| <input type="checkbox"/> Fish Farm/Pond | | .m] | | |
| <input type="checkbox"/> Fishing net | | .m] | | |
| <input type="checkbox"/> Others (specify): | | .m] | | |

12. Containment measures put in place:

- Booms
 Trench
 Dyke
 Natural depression
 Pit
 None

Others: _____

13. Any pictures or video coverage?

[N]

14. Further response repair initiated as at the time of JIV?

[N]

If yes to item 14, give brief description:

THE PIPELINE REPAIR TEAM HAS DONE PRELIMINARY ASSESSMENT OF THE LEAK POINT AND PEGGED IT TO CONTROL LEAK. CRUDE OIL RECOVERY IS ONGOING.

15. Was there any disruption to the investigation?

[Y]

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If yes to item 15 give brief description: NOT APPLICABLE

D. TYPE/NUMBERS OF PROPERTIES, IF ANY, FOUND WITHIN THE AREA OF SPREAD OF OIL.

16. Structures / Properties

S/N	Type of Structures	Description	Size	Number	Comments
NONE WITHIN AREA OF IMPACT					

17. Crops/Economic Trees

S/N	Type of crops	Young	Medium	Matured	Quantity	Comments
1	OIL PALM	FEW	FEW	FEW	FEW	STAINED WITH CRUDE
<i>(Remaining rows are crossed out with diagonal lines)</i>						

18. Fishing Nets/Fish Ponds

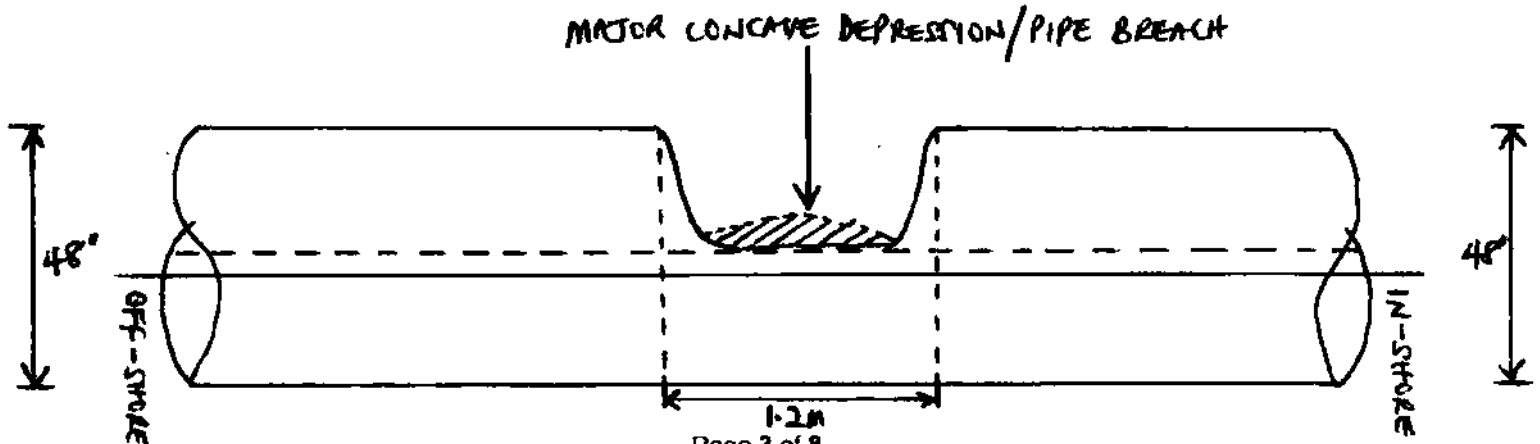
S/N	Nets/Ponds	Description	Quantity/Size	Comments
NONE WITHIN AREA OF IMPACT				

19. 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)

SECTION OF 48" FORCADOS EXPORT PIPELINE SHOWING: POSITION OF MAJOR CONCAVE DEPRESSION AND PIPE BREACH (BETWEEN 9 O'CLOCK - 3 O'CLOCK POSITION) DUE TO EXTERNAL IMPACT.



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F: TABLE SHOWING SOME OF COORDINATES TAKEN DURING JIV FOR AREA CALCULATION

20. Impacted area boundary Coordinates (If more, Print and attach as an appendix)

WGS 84 (DECIMAL - DEGREE)

S-N	Northing	Easting
SEE LIST OF COORDINATES (APPENDIX - I) ATTACHED		

APPENDIX 1

LIST OF IMPACTED AREA COORDINATES WGS 84 (DECIMAL - DEGREE)

POINT	Easting	Northing	
SP	5.335781	5.310841	
1	5.336034	5.310822	
2	5.336272	5.313825	
3	5.335102	5.309015	
4	5.335183	5.309268	
5	5.336624	5.313454	
6	5.335835	5.310814	
7	5.336112	5.309068	
8	5.335937	5.310877	
9	5.335481	5.309222	
10	5.341723	5.301444	
11	5.341958	5.30138	
12	5.341246	5.301779	
13	5.341038	5.301752	
14	5.340831	5.301798	
15	5.339445	5.304477	
16	5.338971	5.307915	
17	5.348272	5.299716	
18	5.354726	5.295945	
19	5.355204	5.295718	
20	5.355465	5.295021	
21	5.356944	5.294368	
22	5.347503	5.298831	
23	5.350613	5.296548	
24	5.355069	5.295474	
25	5.354663	5.295692	
26	5.355257	5.294841	
27	5.356871	5.294097	
28	5.341958	5.301435	
29	5.34175	5.301498	
30	5.340993	5.301852	
31	5.341324	5.301852	
32	5.341083	5.302006	
33	5.341174	5.30196	
34	5.336079	5.310904	
35	5.350622	5.296728	
36	5.355195	5.29561	
37	5.355411	5.29496	

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G. INCIDENT INFORMATION:

a. Impacted Area Details

- Total calculated area of impact 8.2966 Ha
- Impact within R.O.W YES
- Impact outside R.O.W YES

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

Recovered oil V_{rec} :	<u>190.19</u>	Barrels
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Controlled recovery/evacuation from source with no impact to environment:

<u>NIL</u>	Barrels
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c. Net Estimated Spilled Volume V_{est} (bbbls)* =

956.01 BBLS

Estimated Reported Volume V_{rep} (bbbls) =**

957 BBLS

***Notes:**

- Volume estimation was done using an excel based tool. (see attached for details on the calculation)
- Reported spilled volume is an estimate

Write other relevant notes taken into consideration for estimating the spilled in the box below:

NOT APPLICABLE

*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 Volume (m³) x 6.29. **Round up estimated volume to next whole number using the following rules:*

- Any spill volume in excess of 1 bbl is rounded up to the next whole number
- Any spill volume in less than 1 bbl is rounded up to the next 0.1 bbl

Examples:

Calculated volume	15.1 bbl	Reported volume	16 bbl
Calculated volume	0.33 bbl	Reported volume	0.4 bbl
Calculated volume	0.01 bbl	Reported volume	0.1 bbl

Whenever this estimation tool is not applicable please refer to paragraph 6.1 (Exclusions) of the JIV procedure to use appropriate steps for volume estimation, record the calculation on a piece of paper and attach to the JIV report

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d. General Status of the site

- | |
|--|
| i. Joint investigation of the incident site found that there is no residual impact after the initial response and JIT therefore recommend that the site be closed out <input type="checkbox"/> |
| ii. Investigation of the incident site showed that there is residual impact on site requiring further works <input checked="" type="checkbox"/> |

e. Representatives

This report was filled, agreed and signed by the following joint investigation team representatives:

- Host Community:
- Department of Petroleum Resources (DPR):
- National Oil Spill Detection and Response Agency (NOSDRA):
- State Ministry of Environment (SME):
- Asset Owner:
- Signatories agree with reported findings:
- Separate DPR form has been filled out with same findings

Tick as applicable

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f. Appendix 1: Overview sketch of the site

