

JOINT INVESTIGATION REPORT

INCIDENT NO: 1575128 JIV report S/N: Nº 0000361

(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: 1575128 2. Type of incident* OIL SPILL
3. Name of Location 48" FORCADOS TERMINAL EXPORT PIPELINE
4. Name of nearest community OGTULAGHA KINGDOM 5. State: DELTA 6. LGA BURUTU
7. Type of Production facility/Installation OIL PIPELINE
8. Asset owner/District THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED/SWAMP WEST

B. INCIDENT INFORMATION:

9. Details of incident
a. Date of incident: 14TH FEBRUARY, 2016
b. Start date/time of investigation: 17TH FEBRUARY, 2016 AT 1405 HRS
c. Investigation End date: 21ST FEBRUARY, 2016 Actual investigation duration, days: FIVE 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 type="checkbox"/> Swampy | <input type="checkbox"/> Exposed pipe surface |
| <input type="checkbox"/> Well Platform (on Water) | <input type="checkbox"/> DrillRig | |

Additional observations around the spill point: INCIDENT CAUSE WAS CONFIRMED AS THIRD PARTY INTERFERENCE, ESTABLISHED DURING MULTIPLE DIVING OPERATIONS TO THE LEAK POINT. A MAJOR LONGITUDINAL CONCAVE DEPRESSION AND PIPE BREACH (EXTERNAL IMPACT) WAS OBSERVED BY THE DIVERS. PIECES OF FRESHLY REMOVED CONCRETE COATING WERE RECOVERED FROM THE SEA BED.

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

- | | | |
|---|--|--|
| <input type="checkbox"/> Drilled hole | <input type="checkbox"/> Hack saw cut | <input checked="" type="checkbox"/> Tear (<u>0.3M WIDE</u>) |
| <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) Encroachment f) Fire.

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g. Spill point coordinates

h. Measuring unit

WGS 84

Northing:	Easting:
05.276724	005.301935
<i>[Signature]</i>	<i>[Signature]</i>

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) OPEN SEA

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] |
| <input type="checkbox"/> Drinking water source | [0 , m] |
| <input type="checkbox"/> Built up area | [10 , m] |
| <input type="checkbox"/> Farmlands | [, m] |
| <input type="checkbox"/> Fish Farm/Pond | [, m] |
| <input type="checkbox"/> Fishing net | [0 , m] |
| <input type="checkbox"/> Others (specify). | |

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:

CRUDE OIL RECOVERY IS ON-GOING

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.	MANGROVES	YES	YES	YES	LOT	STAINED WITH CRUDE OIL
2.	NYPA PALM	YES	YES	YES	LOT	STAINED WITH CRUDE OIL
/						

18. Fishing Nets/Fish Ponds

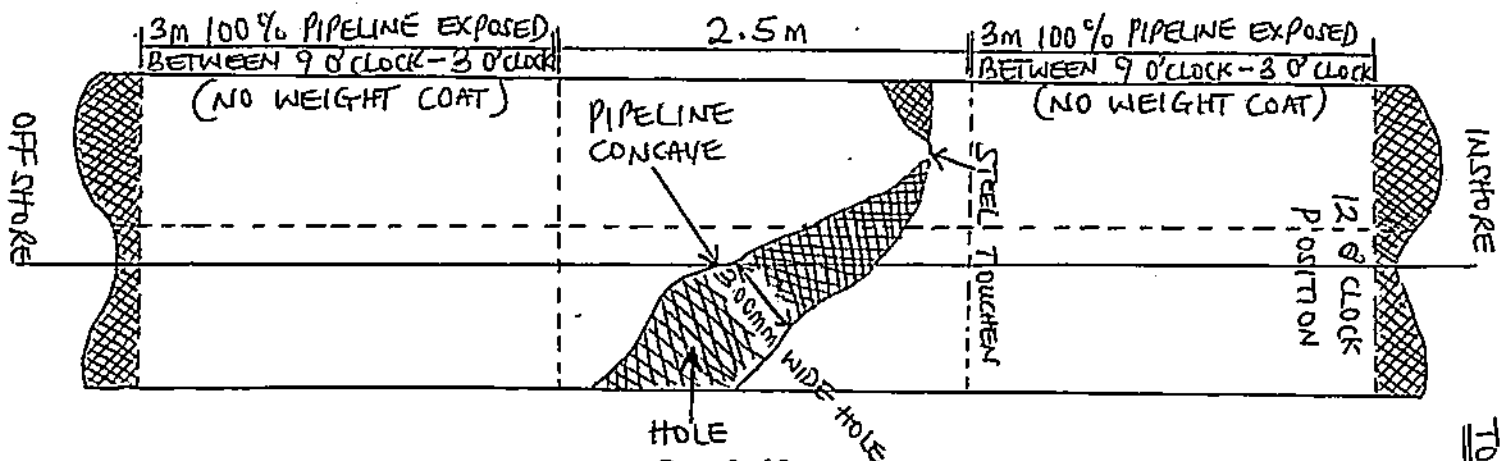
S/N	Nets/Ponds	Description	Quantity/Size	Comments
1.	FISHING NETS	STAINED WITH CRUDE OIL	2 HEAPS	NOT COUNTED
/				

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

S/N	Others	Description	Quantity/Size	Comments
1.	FISHING TRAPS	STAINED WITH CRUDE OIL	3	OIL STAINED FISH TRAPS
/				

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 TERMINAL EXPORT PIPELINE, SHOWING POSITION OF MAJOR LONGITUDINAL CONCAVE DEPRESSION AND PIPE BREACH-EXTERNAL IMPACT



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G. INCIDENT INFORMATION:

a. Impacted Area Details

- Total calculated area of impact 2419.39 Ha (SURFACE = 19.39 Ha + AIR = 2400 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} :	140	Barrels
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Controlled recovery/evacuation from source with no impact to environment:

NIL	Barrels
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c. Net Estimated Spilled Volume V_{Est} (bbls)* =

5433.48 BBLS

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

5434 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:

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 m^3 to barrels is Volume (m^3) 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 = 15.3 bbl ----- Reported volume = 16 bbl
 Calculated volume = 0.35 bbl ----- Reported volume = 0.4 bbl
 Calculated volume = 0.01 bbl ----- Reported volume = 0.1 bbl

Wherever this estimation tool is not applicable please refer to paragraph 6c (Deviations) of the JIV procedure to use appropriate steps for volume estimation; record the calculation in a plain sheet 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:

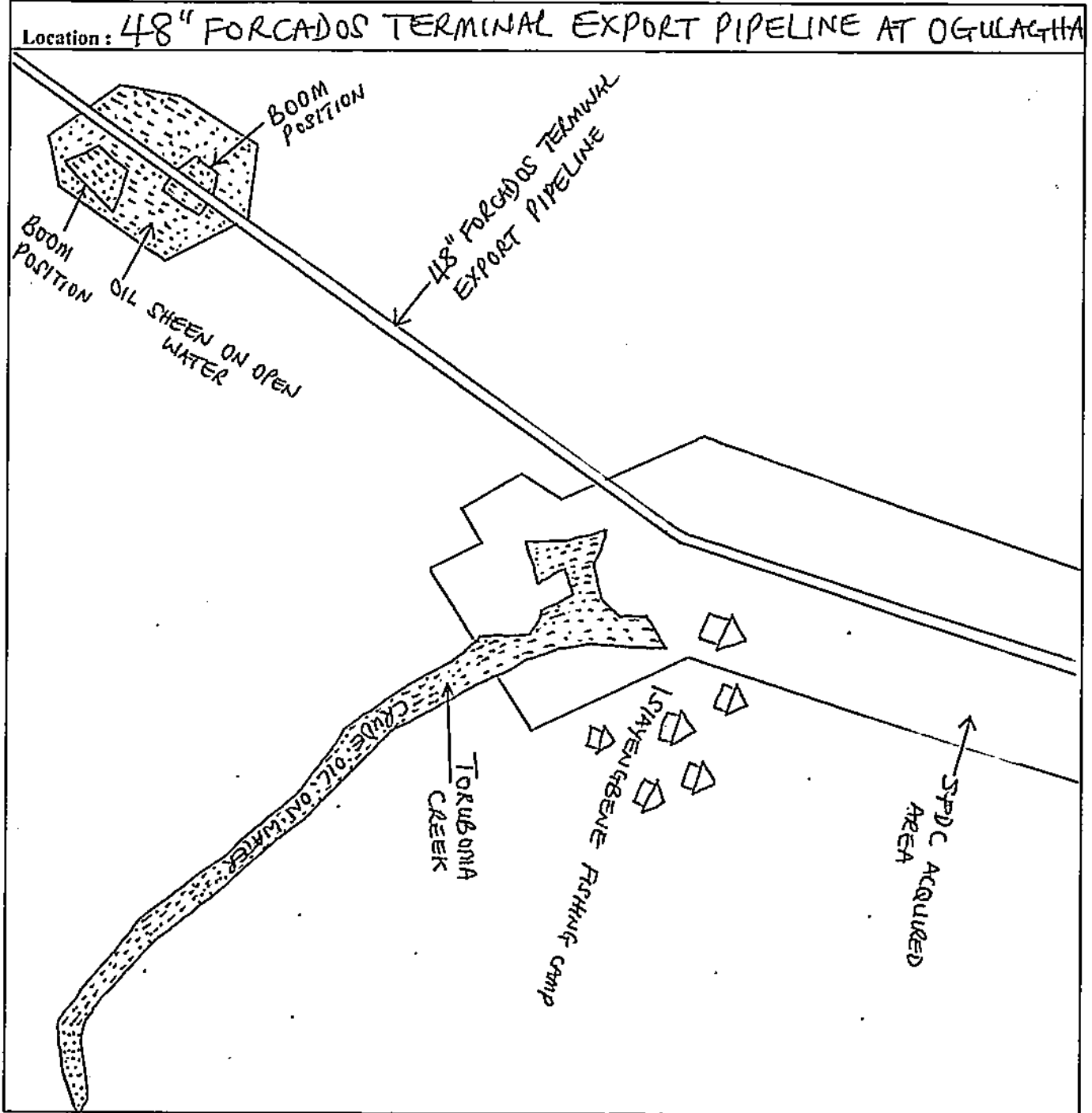
- Host Community:
- Department of Petroleum Resources (DPR):
- National Oil Spill Detection and Response Agency (NOSDRA):
- State Ministry of Environment (SME):
- Asset Owner:
- Signatories agree with reported findings:
- Separate DPR form has been filled out with same findings:

Tick as applicable

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f. Appendix 1: Overview sketch of the site

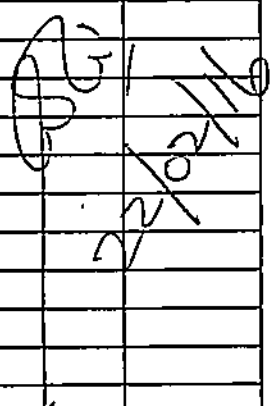


APPENDIX 1

INC.NO:1575128.			
COORDINATE LIST OF 48" FORCARDOS TERMINAL EXPORT PIPELINE SPILL @ OGULAGHA.			
WGS 84			
PTS	Eastings	Northings	REMARKS
SP	5.301935	5.276724	SPILL POINT
1	5.301933	5.276918	BOOM POSITION
4	5.302203	5.27672	BOOM POSITION
3	5.301986	5.27647	BOOM POSITION
2	5.301716	5.276712	BOOM POSITION
5	5.301961	5.276097	BOOM POSITION
8	5.302412	5.275989	BOOM POSITION
7	5.302254	5.275633	BOOM POSITION
6	5.3016	5.275652	BOOM POSITION
9	5.302724	5.277692	OIL SHEEN ON WATER
16	5.304138	5.27744	OIL SHEEN ON WATER
10	5.304052	5.275846	OIL SHEEN ON WATER
11	5.302734	5.275318	OIL SHEEN ON WATER
12	5.300792	5.275256	OIL SHEEN ON WATER
13	5.300297	5.276117	OIL SHEEN ON WATER
14	5.301106	5.277169	OIL SHEEN ON WATER
15	5.301948	5.27753	OIL SHEEN ON WATER
239	5.33306	5.29917	CRUDE OIL ON WATER
240	5.33312	5.29912	CRUDE OIL ON WATER
241	5.33311	5.29901	CRUDE OIL ON WATER
242	5.33348	5.29873	CRUDE OIL ON WATER
243	5.33374	5.29874	CRUDE OIL ON WATER
244	5.3339	5.29888	CRUDE OIL ON WATER
245	5.33384	5.29897	CRUDE OIL ON WATER
246	5.33391	5.29898	CRUDE OIL ON WATER
247	5.33397	5.29896	CRUDE OIL ON WATER
248	5.33405	5.29894	CRUDE OIL ON WATER
249	5.33395	5.29888	CRUDE OIL ON WATER
2370	5.334097	5.298647	CRUDE OIL ON WATER
2430	5.333859	5.298547	CRUDE OIL ON WATER
2420	5.333498	5.298457	CRUDE OIL ON WATER
250	5.33337	5.29782	CRUDE OIL ON WATER
251	5.33343	5.2977	CRUDE OIL ON WATER
260	5.33381	5.29688	CRUDE OIL ON WATER
263	5.33419	5.29568	CRUDE OIL ON WATER
264	5.33453	5.29457	CRUDE OIL ON WATER
265	5.3348	5.29379	CRUDE OIL ON WATER
266	5.33505	5.29309	CRUDE OIL ON WATER
267	5.33538	5.29178	CRUDE OIL ON WATER

OG
22/02/16

300	5.33562	5.29101	CRUDE OIL ON WATER				
270	5.33587	5.29046	CRUDE OIL ON WATER				
271	5.33603	5.29011	CRUDE OIL ON WATER				
273	5.33657	5.28862	CRUDE OIL ON WATER				
274	5.33676	5.28804	CRUDE OIL ON WATER				
276	5.33721	5.28684	CRUDE OIL ON WATER				
278	5.33768	5.28555	CRUDE OIL ON WATER				
280	5.33858	5.28352	CRUDE OIL ON WATER				
283	5.33934	5.28134	CRUDE OIL ON WATER				
286	5.34013	5.2789	CRUDE OIL ON WATER				
287	5.34063	5.27741	CRUDE OIL ON WATER				
289	5.34185	5.27493	CRUDE OIL ON WATER				
291	5.34311	5.272	CRUDE OIL ON WATER				
294	5.34414	5.26886	CRUDE OIL ON WATER				
299	5.34537	5.26705	CRUDE OIL ON WATER				
297	5.345218	5.26692	CRUDE OIL ON WATER				
298	5.34491	5.26724	CRUDE OIL ON WATER				
295	5.34445	5.26779	CRUDE OIL ON WATER				
293	5.34371	5.26951	CRUDE OIL ON WATER				
292	5.3432	5.27124	CRUDE OIL ON WATER				
290	5.34199	5.273695	CRUDE OIL ON WATER				
288	5.340964	5.276241	CRUDE OIL ON WATER				
285	5.339917	5.278829	CRUDE OIL ON WATER				
284	5.339286	5.28068	CRUDE OIL ON WATER				
282	5.338873	5.281976	CRUDE OIL ON WATER				
281	5.338606	5.282736	CRUDE OIL ON WATER				
279	5.337883	5.284528	CRUDE OIL ON WATER				
275	5.336779	5.287401	CRUDE OIL ON WATER				
272	5.33606	5.289436	CRUDE OIL ON WATER				
269	5.335483	5.290828	CRUDE OIL ON WATER				
301	5.334578	5.293719	CRUDE OIL ON WATER				
258	5.33341	5.29688	CRUDE OIL ON WATER				
257	5.33329	5.29708	CRUDE OIL ON WATER				
256	5.33319	5.2973	CRUDE OIL ON WATER				
252	5.33325	5.29773	CRUDE OIL ON WATER				
253	5.33321	5.2979	CRUDE OIL ON WATER				
254	5.33321	5.29816	CRUDE OIL ON WATER				
255	5.333267	5.298591	CRUDE OIL ON WATER				
2410	5.333022	5.298737	CRUDE OIL ON WATER				
2371	5.332203	5.29859	CRUDE OIL ON WATER				
2372	5.332679	5.298276	CRUDE OIL ON WATER				
237	5.33259	5.29881	CRUDE OIL ON WATER				
237	5.33259	5.29881	BOOM POSITION				
2373	5.333567	5.298004	BOOM POSITION				



 Signature: [Handwritten initials]

 Date: 11/20/16