

JOINT INVESTIGATION REPORT

INCIDENT NO: 2080355 JIV report S/N: 1142

(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: 2080355 2. Type of incident* OIL SPILL
- 3. Name of Location 24" TRANS - RAMOS PIPELINE
- 4. Name of nearest community AGHORO 1 5. State: BAYELSA LGA EKREMOR
- 7. Type of Production facility/Installation OIL PIPELINE
- 8. Asset owner/District THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED / PIPELINE

B. INCIDENT INFORMATION:

- 9. Details of incident
 - a. Date of incident: 17TH MAY, 2018
 - b. Start date/time of investigation: 25TH MAY, 2018 AT 10:00HRS
 - c. Investigation End date: 23RD JUNE 2018 Actual investigation duration, days: 4 DAYS
 - d. Description of spill point environment

- | | | |
|---|-------------------------------------|--|
| <input checked="" type="checkbox"/> Firm soil | <input type="checkbox"/> Loose soil | <input type="checkbox"/> Recently excavated area |
| <input type="checkbox"/> Under water | <input 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: UPON EXPOSURE OF THE PIPELINE BY EXCAVATION, A LONGITUDINAL CRACK ON THE CONCRETE COATING AS AN INDICATION OF PIPE TEAR WAS OBSERVED BY THE JOINT INVESTIGATION TEAM

- c. Description of leak point (tick as applicable);

<input type="checkbox"/> Drilled hole	<input type="checkbox"/> Hack saw cut	<input checked="" type="checkbox"/> Tear (<u>ABOUT 2M LONG</u>).
<input type="checkbox"/> Complete Rupture	<input 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"/> Corrosion	<input checked="" type="checkbox"/> Others (specify) <u>LONGITUDINAL CRACK ON CONCRETE COATING AT 9 O' CLOCK POSITION</u>	
- f. Incident caused by:

<input type="checkbox"/> Third party interference (Sabotage <input type="checkbox"/> ; crude theft <input type="checkbox"/> ; Line theft <input type="checkbox"/> ; Accidental 3 rd party damage <input type="checkbox"/>).
<input checked="" type="checkbox"/> Operational <input type="checkbox"/> Mystery spills <input type="checkbox"/> Others (specify) _____

*This can be: a) Oil Spill b) Drilling fluid/Chemical c) Siltation d) construction e) Encroachment f) Fire.

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g. Spill point coordinates

h. Measuring unit

Northing: <u>LATITUDE</u>	Easting: <u>LONGITUDE</u>
<u>5.10836</u>	<u>5.43346</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) AGHORO RIVER

ii. Weather condition

- Rain
 Sunny
 Dry
 Wet
 Windy
 Hot
 cool

11. Distance from the nearest sensitive habitat

- Government reserved and designated protected area
 Drinking water source
 Built up area
 Farmlands
 Fish Farm/pond
 Fishing net
 Others (specify): MANGROVES, FISH CAGES AND FISH TRAPS
- [1000 ,m] → IMPACTED BY SPILL
 [2000 ,m] → IMPACTED BY SPILL
 [4000 ,m] → IMPACTED BY SPILL
 [8000 ,m] → IMPACTED BY SPILL

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 ACTIVITIES ARE ONGOING AT SIT

15. Was there any disruption to the investigation?

[Y] [N]

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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
	<u>SHRINE</u>				<u>IMPACTED BY SPILL</u>

17. Crops/Economic Trees

S/N	Type of crops	Young	Medium	Matured	Quantity	Comments
	<u>BULK ASSESSMENT</u>			<u>ADOPTED</u>		<u>RECOMMENDED</u>

18. Fishing Nets/Fish Ponds

S/N	Nets/Ponds	Description	Quantity/Size	Comments
	<u>BULK ASSESSMENT</u>			<u>ADOPTED RECOMMENDED</u>

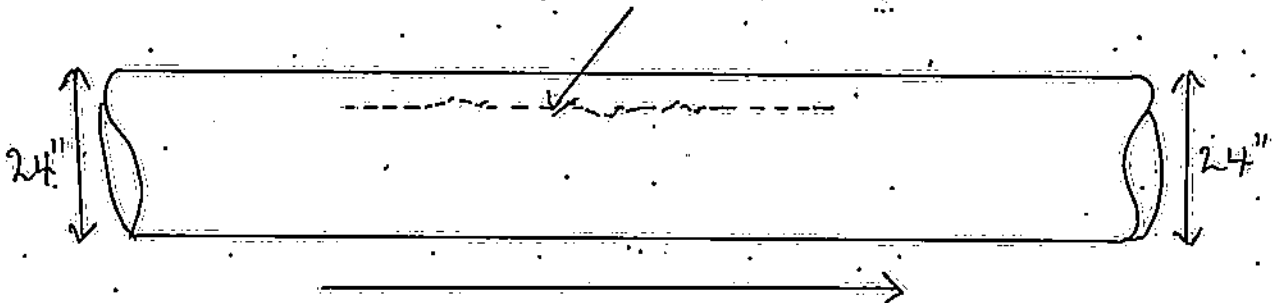
19. Others (Specify) i.e. Animal Traps

S/N	Others	Description	Quantity/Size	Comments

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 I)

SECTION OF 24" TRANS - RAMOS PIPELINE AT AGHORO 1 SHOWING A LONGITUDINAL CRACK ON CONCRETE COATING AT 1 O'CLOCK POSITION

LONGITUDINAL CRACK OF THE CONCRETE COATING AT 1 O'CLOCK POSITION (LEAK POINT)



FROM BRASS CREEK TO FORCADOS TERMINAL

JIV_2080355_AGHORO-1

PT_ID	LONG_X	LAT_Y			PT_ID	LONG_X	LAT_Y
SP	5.43346	5.1084			46	5.443186	5.114792
1	5.42839	5.103282			47	5.442495	5.114575
2	5.428143	5.103535			48	5.442023	5.114434
3	5.446394	5.115959			49	5.44223	5.114881
4	5.446391	5.116408			50	5.441689	5.114878
5	5.446097	5.116349			51	5.441352	5.115169
6	5.446034	5.115999			52	5.440833	5.115049
7	5.445501	5.11586			53	5.440383	5.114885
8	5.445625	5.116246			54	5.441493	5.11459
9	5.44516	5.116054			55	5.441312	5.114868
10	5.444898	5.116153			56	5.440876	5.114771
11	5.444498	5.11586			57	5.440619	5.114571
12	5.445008	5.115614			58	5.440312	5.114377
13	5.444753	5.115847			59	5.440083	5.114415
14	5.444366	5.116052			60	5.43997	5.114316
15	5.444717	5.11634			61	5.439908	5.114006
16	5.444456	5.116198			62	5.439994	5.11464
17	5.444372	5.116674			63	5.43978	5.114454
18	5.44422	5.116997			64	5.439649	5.114059
19	5.444058	5.117167			65	5.440021	5.113608
20	5.44379	5.117157			66	5.439951	5.113435
21	5.444195	5.116378			67	5.439487	5.112978
22	5.444187	5.116201			68	5.43972	5.113642
23	5.443601	5.11701			69	5.439203	5.113038
24	5.44363	5.116627			70	5.438245	5.112562
25	5.44389	5.116349			71	5.438426	5.112642
26	5.44398	5.115959			72	5.438554	5.112583
27	5.443972	5.115386			73	5.437166	5.111523
28	5.443791	5.115289			74	5.437369	5.111383
29	5.443721	5.115974			75	5.437491	5.11115
30	5.443719	5.115569			76	5.437497	5.111714
31	5.443281	5.115676			77	5.437874	5.111908
32	5.443013	5.115476			78	5.437794	5.112059
33	5.44311	5.115253			79	5.437703	5.112302
34	5.443582	5.11536			80	5.438054	5.112479
35	5.443365	5.115362			81	5.438805	5.112776
36	5.443544	5.115234			82	5.439082	5.112919
37	5.44382	5.11494			83	5.438272	5.112356
38	5.443365	5.115079			84	5.438629	5.112347
39	5.443641	5.114792			85	5.438976	5.112604
40	5.443753	5.114527			86	5.439333	5.112765
41	5.443863	5.114291			87	5.4366	5.111372
42	5.443955	5.114394			88	5.43702	5.111115
43	5.443601	5.114611			89	5.43698	5.110749

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4	5.446391	5.116408			50	5.441689	5.114878
5	5.446097	5.116349			51	5.441352	5.115169
6	5.446034	5.115999			52	5.440833	5.115049
7	5.445501	5.11586			53	5.440383	5.114885
8	5.445625	5.116246			54	5.441493	5.11459
9	5.44516	5.116054			55	5.441312	5.114868
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24	5.44363	5.116627			70	5.438245	5.112562
25	5.44389	5.116349			71	5.438426	5.112642
26	5.44398	5.115959			72	5.438554	5.112583
27	5.443972	5.115386			73	5.437166	5.111523
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38	5.443365	5.115079			84	5.438629	5.112347
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41	5.443863	5.114291			87	5.4366	5.111372
42	5.443955	5.114394			88	5.43702	5.111115
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G. INCIDENT INFORMATION:

a. Impacted Area Details .

- Total calculated area of impact 113.03 Ha
- Impact within R.O.W YES
- Impact outside R.O.W YES

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

Recovered oil V_{rec} :	<u>247.5</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} (bbls)* =

<u>1113.40 BARRELS</u>
Estimated Reported Volume** V_{rec} (bbls) = <u>1114 BARRELS</u>

*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:

GROUND ASSESSMENT OF THE DELTA STATE COMMUNITIES
 COULD NOT BE COMPLETED BECAUSE THERE WAS NO LOGISTICS
 TO ACCESS THE AREA DUE TO SHELL SAFETY POLICY
 ON THE LOGISTICS.

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 = 15.3 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
- ii. Investigation of the incident site showed that there is residual impact on site requiring further works

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

Handwritten initials

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f. Appendix 1: Overview sketch of the site

