

JOINT INVESTIGATION REPORT

INCIDENT NO: 2513692 JIV report SIN: 1030177

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

A. GENERAL INFORMATION:

1. Fountain Incident Number: 2513692 2. Type of incident: OIL SPILL
3. Name of Location: 14" OKORDIA - RUMUEKPO PIPELINE
4. Name of nearest community: IKARAMA 5. State: BAYELSA G 10A YENAGWA
7. Type of Production facility/Installation: OIL PIPELINE
8. Asset owner/District: THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED (SPDC)/PIPELINE

B. INCIDENT INFORMATION:

9. Details of incident

- a. Date Reported: 24th NOVEMBER, 2019
b. Start date/time of investigation: 28th NOVEMBER, 2019/1520HRS
c. Investigation End date: 29th NOVEMBER, 2019 actual investigation duration, days: Two (2) DAYS

d. Description of spill point environment

- | | | |
|---|--|--|
| <input type="checkbox"/> Firm soil | <input checked="" 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:

NOT APPLICABLE

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

- | | | |
|---|---|--|
| <input type="checkbox"/> Drilled hole | <input type="checkbox"/> Hack saw cut | <input type="checkbox"/> Tear (_____) |
| <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 |

Others (specify) 6mm CUT (COATING WAS DE-COATED IN AN HEXAGONAL SHAPE WITH SHARP EDGES)

f. Incident caused by:

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

REMARK: FURTHER INVESTIGATIONS TO BE CARRIED OUT TO ESTABLISH FAILURE MODE ON OR BEFORE DECEMBER, 2020.

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g. Spill point coordinates (WGS 84)
 h. Measuring unit

Northing: <u>LATITUDE</u> <u>5.14710</u>	Easting: <u>LONGITUDE</u> <u>6.45846</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 to Sensitive habitat within 100m radius

- | | |
|--|----------------|
| <input type="checkbox"/> Government reserved and designated protected area | [NIL ,m] |
| <input type="checkbox"/> Drinking water source | [NIL ,m] |
| <input type="checkbox"/> Built up area | [NIL ,m] |
| <input checked="" type="checkbox"/> Farmlands | [,m] IMPACTED |
| <input type="checkbox"/> Fish Farm/Pond | [NIL ,m] |
| <input checked="" type="checkbox"/> Fishing net | [,m] IMPACTED |
| <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 AND REPAIR ACTIVITIES

15. Was there any disruption to the investigation?

[Y]

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If yes to item 15 give brief description:

NOT APPLICABLE

16. Was JIV delayed?

(Y) (N)

If yes to item 16 give brief description:

NOT APPLICABLE

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

17. Structures / Properties

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

18. Crops Economic Trees

S/N	Type of crops	Young	Medium	Matured	Quantity	Comments
1.	PALM TREE		✓	✓	7 NO	IMPACTED
2.	CASSAVA	✓	✓		FEW	IMPACTED

19. Fish Nets/Ponds

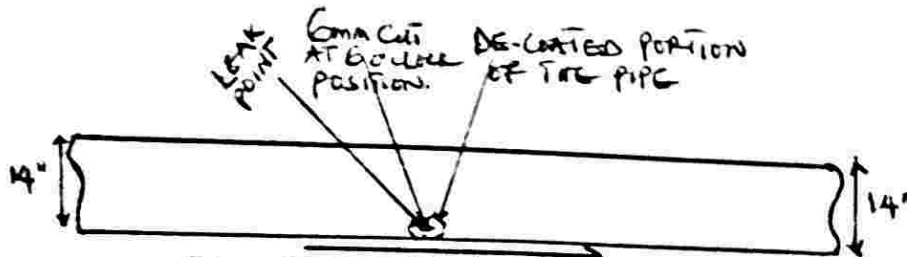
S/N	Fish/Nets/Ponds	Description	Quantity/Size	Comments
	FISHING NET	SMALL	1 NO	IMPACTED BY SPILL

20. 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 14" OKORDIA-RUMUKPE PIPELINE AT IKRAMA SHOWING A 6mm CUT AND A DE-COATED PORTION OF THE PIPE AT 6 O'CLOCK POSITION DUE SUSPECTED EXTERNAL INTERFERENCE.



FROM OKORDIA TO RUMUKPE PIPELINE

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

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

S/N	Northing	Easting

PLEASE SEE ATTACHED ~~TABLE~~ 29-11-2019

COORDINATE LIST OF JIV DONE ALONG 14" OKORDIA TO
RUMUEKPE P/L AT IKARAMA
INC. NO. : 2019_2513692

PT_ID	LONGITUDE(WGS84)	LATITUDE (WGS84)
172	6.45816	5.1471
171	6.45817	5.14737
170	6.45826	5.14743
169	6.45866	5.14711
168	6.45903	5.14721
167	6.45928	5.14691
166	6.45921	5.14668
165	6.45923	5.1464
164	6.45931	5.14621
163	6.459	5.14529
162	6.45913	5.14468
161	6.45905	5.1444
160	6.45888	5.14433
160A	6.45865	5.14449
160B	6.45821	5.14299
159	6.45791	5.14237
158	6.45748	5.14248
157	6.45719	5.14271
156	6.45684	5.14272
155	6.45621	5.14313
154	6.45548	5.14337
153	6.45515	5.14305
152	6.45488	5.1435
151	6.45505	5.14376
150	6.45569	5.14385
149	6.45588	5.14463
148	6.45615	5.14468
147	6.45645	5.14489
146	6.45709	5.14518
145	6.45741	5.14549
144	6.45785	5.14568
143	6.45781	5.14574
142	6.458	5.14594
141	6.45812	5.14606
140	6.4581	5.14616
139	6.45816	5.14617
138	6.45827	5.14615
137	6.45838	5.14622
136	6.45841	5.14646
135	6.45859	5.14682

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29-11-2019

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G. INCIDENT INFORMATION:

a. Impacted Area Details

- Total calculated area of impact 10.93 HA
- Impact within SPDC R.O.W YES
- Impact outside SPDC R.O.W YES

b. Volume of oil recovered before completion of JIV report

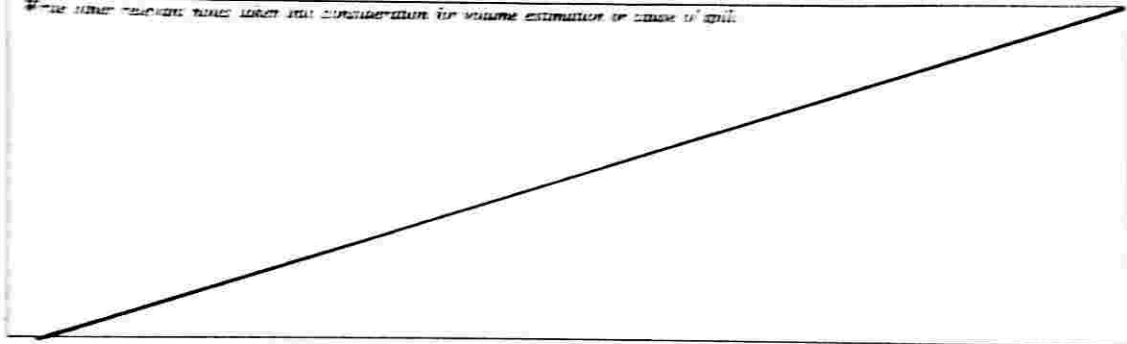
Recovered oil Volume	20	Barrels
Controlled recovery operations from source with no impact to environment		
NIL		Barrels

<p>c. Net Estimated Spilled Volume $V_{est}/\text{barrels}^* = 106.95 \text{ BARRELS}$</p>
<p>Estimated Reported Volume $V_{rep}/\text{barrels}^{**} = 107 \text{ BARRELS}$</p>

***Notes:**

- Volume estimation was done using an excel based tool, file attached for details on the calculation
- Reported spilled volume is an estimate

Write other relevant notes when this consideration for volume estimation is cause of spill.



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 = barrels. **Round up estimated volume to next whole number using the following rules:

- Any spill volume in excess of 1.0m³ is rounded up to the next whole number
- Any spill volume is less than 1.0m³ is rounded up to the next 0.1 m³.

Examples: Calculated volume = 0.53 m³ — Reported volume = 0.6 m³
 Calculated volume = 0.55 m³ — Reported volume = 0.6 m³
 Calculated volume = 0.11 m³ — Reported volume = 0.1 m³.

Whenever this estimation tool is not applicable please refer to paragraph 6.3.1 of the JIV procedure to use appropriate steps for volume estimation. Record the calculation in a joint 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 therefore recommend that the site be closed out.
- ii. Investigation of the incident site showed that there is residual impact on site requiring further work.

e. Representatives

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

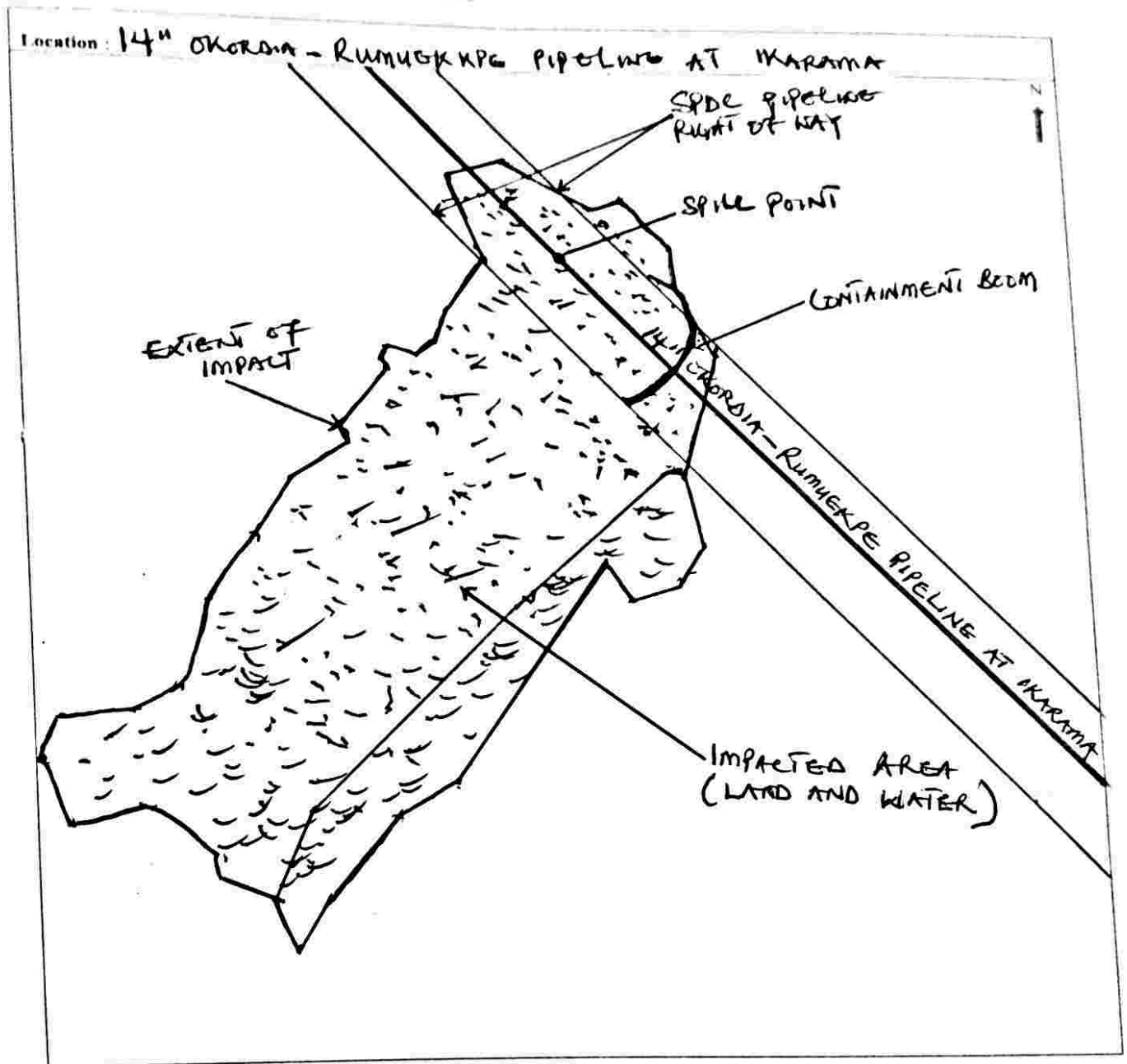
- Host Community:
- Department of Petroleum Resources (DPR):
- National Oil Spill Detection and Response Agency (NOSDRA):
- State Ministry of Environment (SME):
- Shell Petroleum Development Company (SPDC):
- Separate DPR form has been filled out with same findings:

Tics as applicable

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f. Appendix 1: Overview sketch of the site



Version 2019/01

Distribution of copies : White (Asset Owner); Pink (DPR); Green (NOSDRA); Yellow (State Ministry of Environment) ; Blue (Host Community)