

JOINT INVESTIGATION REPORT

INCIDENT NO: 2193585 JIV report S/N:0052

(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: 2193585 2. Type of incident* OIL SPILL
3. Name of Location 4" BONNY WELL-18S FLOWLINE RISER
4. Name of nearest community OLOMA 5. State: RIVERS 6. LGA BONNY
7. Type of Production facility/Installation FLOWLINE/WELLHEAD
8. Asset owner/District THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED/CENTRAL EAST

B. INCIDENT INFORMATION:

9. Details of incident
a. Date of incident: 27TH OCTOBER 2018
b. Start date/time of investigation: 31ST OCTOBER 2018 AT 1523 HRS
c. Investigation End date: 31ST OCTOBER 2018 Actual investigation duration, days: ONE (1) DAY
d. Description of spill point environment

- | | | |
|--|-------------------------------------|--|
| <input 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 checked="" type="checkbox"/> Well Platform (on Water) | <input type="checkbox"/> Drill Rig | |

Additional observations around the spill point: CAUSE OF LEAK WAS CONFIRMED TO BE OPERATIONAL, ESTABLISHED DURING ASSESSMENT OF THE CORRODED SECTION OF 4" BONNY WELL-18S FLOWLINE RISER (AT THE WELLHEAD).

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 |
| <input checked="" type="checkbox"/> Corrosion | <input type="checkbox"/> Others(specify) _____ | |

f. Incident caused by:

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

*This can be: a) Oil Spill b) Drilling fluid/Chemical c) Siltation d) construction e) Encroachment f) Fire. Version 2018/01
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g. Spill point coordinates

WGS 84 (DECIMAL-DEGREE)

| Measuring unit Northing: | Easting: |
|-----------------------------|----------|
| 4.470659 | 7.199534 |
| / | / |
| / | / |

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

- Government reserved and designated protected area
- Drinking water source
- Built up area
- Farmlands
- Fish Farm/Pond
- Fishing net
- Others (specify): _____

[] ,m
 [] ,m
 [] ,m
 [] ,m
 [] ,m
 [] ,m
 } NONE WITHIN THE VICINITY

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?

[Y] []

If yes to item 14, give brief description:

NOT APPLICABLE

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 |
|-----|----------------------------|-------|--------|---------|----------|----------|
| | NONE WITHIN AREA OF IMPACT | | | | | |

18. Fishing Nets/Fish Ponds

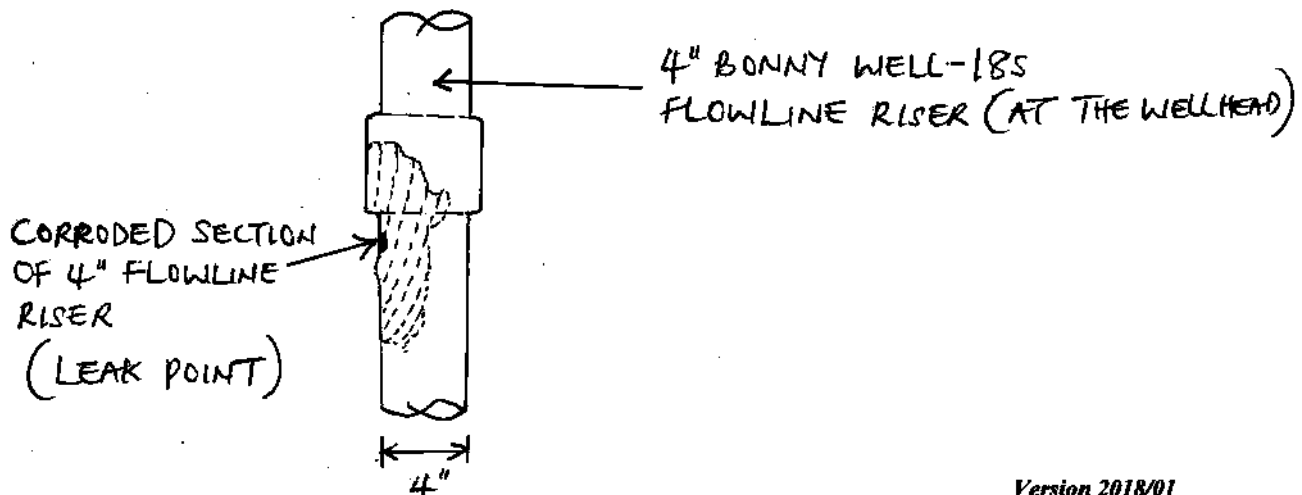
| S/N | Nets/Ponds | Description | Quantity/Size | Comments |
|-----|----------------------------|-------------|---------------|----------|
| | NONE WITHIN AREA OF IMPACT | | | |

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 detailed 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 4" BONNY WELL-18S FLOWLINE RISER (AT THE WELLHEAD)
IN OLOMA, SHOWING CORRODED LEAK POINT



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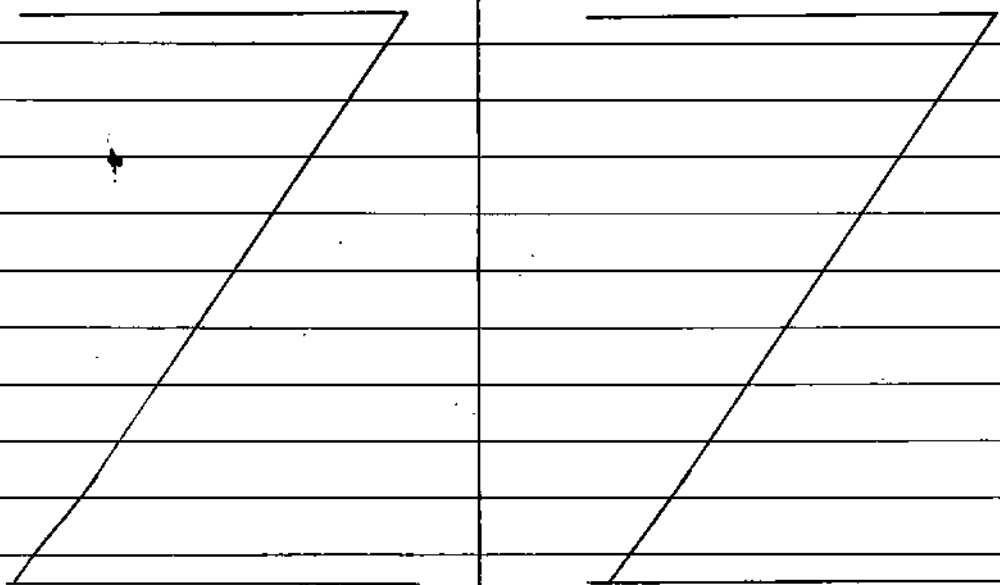
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F: TABLE SHOWING SOME OF COORDINATES TAKEN DURING JIV FOR AREA CALCULATION

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

WGS 84 (DECIMAL-DEGREE)

| S/N | Northing | Easting |
|-----|--|----------|
| 1. | 4.47072 | 7.1996 |
| 2. | 4.470598 | 7.19958 |
| 3. | 4.470621 | 7.199465 |
| 4. | 4.47075 | 7.19951 |
| 5. | 4.47089 | 7.19914 |
| 6. | 4.4711 | 7.19924 |
| 7. | 4.47125 | 7.19949 |
| 8. | 4.470845 | 7.199715 |
| 9. | 4.47059 | 7.199772 |
| 10. | 4.470412 | 7.199427 |
| 11. | 4.470545 | 7.199253 |
| 12. | 4.47085 | 7.199091 |
| |  | |

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G. INCIDENT INFORMATION:

a. Impacted Area Details

- Total calculated area of impact 0.421 H_A
- Impact within R.O.W YES
- Impact outside R.O.W NO

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

| | | |
|---------------------------|----------|---------|
| Recovered oil V_{rec} : | <u>4</u> | Barrels |
|---------------------------|----------|---------|

Controlled recovery/evacuation from source with no impact to environment:

| | |
|------------|---------|
| <u>NIL</u> | Barrels |
|------------|---------|

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

4.16 BBLs

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

5 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 volume 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 = 15.3 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"/> |

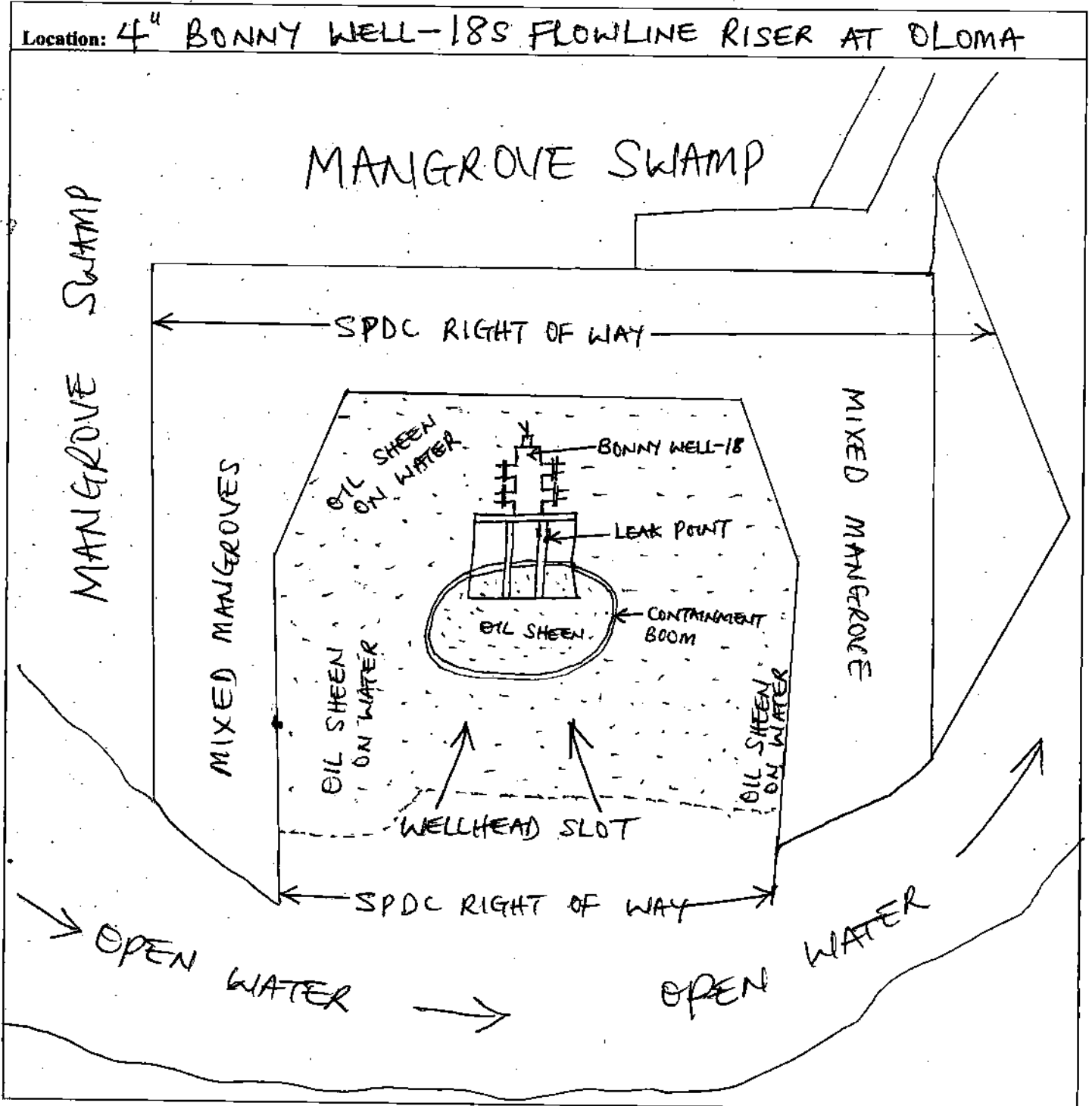
e. Representatives

| |
|--|
| <p>This report was filled, agreed and signed by the following joint investigation team representatives:</p> <ul style="list-style-type: none">• Host Community: <input checked="" type="checkbox"/>• Department of Petroleum Resources [DPR]: <input type="checkbox"/>• National Oil Spill Detection and Response Agency [NOSDRA]: <input checked="" type="checkbox"/>• State Ministry of Environment [SME]: <input checked="" type="checkbox"/>• Asset Owner: <input checked="" type="checkbox"/>• Signatories agree with reported findings: <input checked="" type="checkbox"/>• Separate DPR form has been filled out with same findings <input type="checkbox"/> <p style="text-align: right;"><i>Tick as applicable</i></p> |
|--|

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f. Appendix 1: Overview sketch of the site



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