JOINT INVESTIGATION REPORT FOR INCIDENT NO: 1230972 JIV report S/N: 00/01 (Note: As practicable as possible the JIT report is to be signed in the field by all the participating parties) A. GENERAL INFORMATION; 1. Spill incident Number: 1230972 2. Type of incident* OIL SPILL 3. Name of Location 10" DIEBU CREEK - MUNI RIVER PIPELING. 4. Name of nearest community EKOWE 5. State: BAYELSA 6. LGA SOUTHERN IJAW 7. Type of Production facility/Installation OIL PIPELINE Asset owner/District PIPELINE **B. INCIDENT INFORMATION:** tails of incident a. Date of incident: 13 TH August, 2014 9. Details of incident b. Start date/time of investigation: 9TH SEPTEMBEX, 2014 / 12:52 PAG. c. Investigation End date: 9Th Strifms End Altual investigation duration, days: ON E(1) ily. d. Description of spill point environment Recently excavated area Loose soil ☐Firmed soil Exposed pipe surface □ Swampy Under water ☐Drill Rig ☐ Well Platform (on Water) Additional observations around the spill point: e. Description of leak point (tick as applicable); ☐ Tear (_______), Hack saw cut Drilled hole Well head tampering ☐Inward dent, Complete Rupture ☐ Missing Pipeline/Flowline ☐ Failed Weld-on illegal hot tap valve, ☐ Failed Clamp ☐ Third party tampering with Clamp ☐Crude oil theft (illegal bunkering) point, ☐Third party tampering with flange, Third party tampering with valve setting, ☐Surge vessel overflow, Saver-pit over flow, Corrosión ☐Flare System/Bund wall failure ☐Accidental 3rd party equipment ☐Bulging Outward Cold vent Com unit failure □ Valve Failure impact Others (specify)_ Relief valve failure f. Incident caused by: Third party interference (Sabotage , crude theft ; Line theft ; Accidental 3rd party damage) Others (including Mystery spills)

☐ Operational

^{*}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 Measuring unit (M)	Mid belt
Northing:	Easting:
82780.34	404575.51
7 07	7 0(1)
9000	
C. RISK ASSESSMENT	· - ·
10. Type of environment:	
□Land □Swamp □Water □Se	easonal swamp Shoreline/Waterfront
i. Type of environment to which oil has spread:	
□Land	ver (identify)
ii. Weather condition	
☐Rain ☐Sunny ☐Dry ☐Wet 11. Distance from the nearest sensitive habitat	□Windy □Hot □cool
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]
12. Containment measures put in place;	
□Booms □Trench ☑Dyke □Na □Others:	atural depression
13. Any pictures or video coverage?	[N]
14. Further response/repair initiated as at the time of JIV?	LYT [N]
If yes to item 14, give brief description: REPAIR WO	RK WAS DONE BY
CLAMPING.	
15. Was there any disruption to the investigation?	[Y] [H]
If yes to item 15 give brief description:	·
MOT APPLICABLE	

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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
MONE	1114	NF	TREA	0)	IMPAC
17. Crops/Economic Tree	s	<u> </u>			
S/N Type of crops Your		Medium	Matured	Quantity	Comments
		Medium	Matured	Quantity Fbul	Comments

18. Fish/Nets/Ponds

S/N Fish/Nets/Ponds	Description	Quantity/Size	Comments
NONE L	TIHIN A	REA	OF IMPACT

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

S/N (Others	Description	Quantity/Size	Comments
N	DNE /	MHINI AR	EA C	IMPACT
E 00	DUIG DECCRIPTIO	N OF TRAIL TO SEE	<u> </u>	

E. GRAPHIC DESCRIPTION OF LEAK POINT (while detail report of the leak point should be contained in the

SECTION OF 10" DIEBU CREEK - NUMBER PIPELINE AT EKONIE SHOULING POSITION OF HACK SANI CUT AT 10 O'LLUK POSITION.

HACK SAKI CHÍ
/ 10 CH LONG WITH 3 CM EFFECTIV
AT 10 OCLUCIE PUSTIONI.

FROM DIEBU (REEL TO MUNIKIVER.

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F: TABLE SHOWING SOME OF COORDINATES TAKEN DURING JIV FOR AREA CALCULATION 20. Impacted area boundary Coordinates of more, Print and appendix)

S/N	Northing (M)	Easting (M)
	82809.92	404564.42
	82806.86	404561.32
	82779.23	404551.98
	82773.12	404539.62
	82760.85	404533.41
	82751.61	404539.55
	82742.38	404 542.60
	82733.12	404551.82
	82739.19	404573.43
	82742.26	404576.52
	82745.28	404591.95
	82800.60	404592.14
	82776.82	404593.53
		7
		1 6661
		09/09/2014
		1 1 1
	4	

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMTED.
JOINT INVESTIGATION REPORT FOR INCIDENT NO: 1230972 JIV report S/N: 00701
G. INCIDENT INFORMATION:
20. Impacted Area Details
• Total calculated area of impact 0.31 HA
• Impact within SPDC R.O.W 43
Impact outside SPDC R.O.W
21. Volume of oil recovered before completion of JIV (V _{recl}):
Recovered oil V _{recl} : NIL Barrels
Controlled recovery/evacuation from source with no impact to environment:
Min Barrels

22. Net Estimated Spilled Volume V _{Est} (bbls)* =
14.96 BARRELS
Estimated Reported Volume** V _{rep} (bbls)=
15 BARRELS
*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:
1 - 1 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 -
SEE ATTACHED.
· ·
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 column estimation; record the calculation in a plain sheet of paper and attach to the JIV report.

3 Volume of inflitrated oil outside immediate spill point(e) region ($V_{kd\,c}$)

ESTIMATION OF OIL SPILL VOLUME

A

Impacted Area Details Total Calculated Area of Impact Impact within SPDC R O.W			OFFSHORE (Leak stopped at	source)		
i Impact wathin SPDC R OLV if impact outside SPDC R OLV If impact outside SPDC R OLV Estimated Recovered of (Net) Estimated Recovered of (Net) Estimated Recovered of (Net) Estimated Recovered of (Net) Computation of estimated residual volume on site Computation of estimated residual volume on site Computation of volume of free phase oil (Ino land or confined water body) I Total area coupled by pool of free phase oil (Ino land or confined water body) I Estimated Volume of pool of free phase oil, V _{pool} Estimated Volume of pool of free phase oil, V _{pool} Estimated Volume of pool of free phase oil, V _{pool} T 120 Im Computation of estimated volume of infiltrated oil in the soil (V _{pool}) I Volume of infiltrated oil at split point (V _{ref}) I Total area covered by the oil (Initiation) II Vaverage depth of infiltration above leaking facility i.e. pipeline/flowline I Soil type I Cadulation of days for infiltration below the leaking point on pipeline of flowline Incident Date I F Laus of april in operational, use I week as worst case Sonalis accord within 1 (Jupes in various of types v sine. Approximate time to reach time depth below ground level Oil type Sand Loam Clay I Total area covered by the oil (Initiation of oil I 1200 m Initiation of initiation of oil I 1200 m Estimated Volume of infiltrated oil, V _{lots} I Total area covered by the oil (Initiation of oil I Average depth of infiltration below leaking facility i.e. pipeline/flowline I Average depth of infiltration below leaking facility i.e. pipeline/flowline I Average depth of infiltration below leaking facility i.e. pipeline/flowline I Average depth of infiltration below leaking facility i.e. pipeline/flowline I Average depth of infiltration of the leaking facility i.e. pipeline/flowline I Average depth of infiltration of the leaking facil	mpa		**********			2 100 00 m²
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vi Total depth below ground surface of infiltration of oil Estimated Volume of infiltrated oil, V int b 0.000 m	iv	P _e (effective porosity of th	e soil)			0 %
Estimated Volume of inflitrated oil, V int b 0.00 m ³	v	Average depth of infiltration	on below leaking facility i.e. pipeline/flow	vline		0.000 m
	vi	Total depth below ground	surface of infiltration of oil			0.000 m
		Estimated Valuma of in	Nitreteri ali V			0 00 m³
						0.00 bbis

Estimated Volume of Infiltrated oil, V _{erc} 0.13 m ³		ee phase oil in touch with soil			220.00 m ² m ²
Average depth below ground surface of infiltration of oil 0.007 m 0.13 m²	Soil type				Clay ▼
Estimated Volume of Infiltrated oil, V _{inf} 0.13 m³ Estimated Volume of Infiltrated oil, V _{inf} 0.23 m³ Estimated Total Volume of Infiltrated oil, V _{inf} 0.23 m³ Estimated Total Volume of Infiltrated oil, V _{inf} 1.43 bbls Computation of volume of oil on open water based on standard coloration Total area of oil on open water Table of average depth of oil on water based on coloration Spill Factors from USCG FOG (2000 Edition) Banch Visible 0.00004 0.0000 Silvery 0.00005 0.0000 Silvery 0.00005 0.00000 Silgisht Color 0.00015 0.00000 Bright Color 0.00015 0.00000000000000000000000000000	P _e (effective porosity of the	e soil)			8 %
Estimated Volume of Inflitrated oil, V _{lot} 0.32 bble	Average depth below grou	and surface of infiltration of oil			0.007 m
Estimated Total Volume of Inflitrated oil, V _{tot} 1.43 bits Computation of volume of all on open water based on standard coloration	Estimated Volume of inf	litrated oil, V _{info}			0.13 m³
1.43 bbls 1.44 bbls 1.4	Estimated Volume of laf	litrated oil, V _{iof c}			0.82 bbls
Computation of volume of oil on open water based on standard coloration	Estimated Total Volume	of infiltrated oil, V _{inf}			0.23 m ³
Total area of oil on open water	Estimated Total Volume	of inflitrated oil, V _{inf}			1.43 bbis
Total area of oil on open water					
Table of average depth of oil on water based on coloration Spill Factors from USCG FOG (2000 Edition) Aid	=		ard coloration		
Link to Coverage Visual	•				m
Thickness (mm)	- ,			-	
Barely Visible	apin recions from USCG FOG	/snon tationi		I	1
Silvery 0,00008 0,0000		Thickness (mm)	(%)	Volume (m3)	
Slight Color 0.00015 0.0000	Barely Visible	0.00004		0.0000	
Bright Color	Silvery	0.00008		0.0000	
Dull 0.001 0.0000 0.0000	Stight Color	0.00015		0.0000	
Dark 0.002 0.0000	Bright Color	0.0003		0.0000	
Slack oil 0.1 0.0000	<u>Duil</u>	0.001		0.0000	
Estimated Volume of oil on open water, V _{wet} 0.000 Estimated Volume of oil on open water, V _{wet} 0.00 m³ Estimated Volume of oil on open water, V _{wet} 0.00 bbls Ilation of evaporated volume Evaporation Factors (E-Factor) for SPDC Crude oil	<u>Dark</u>	0.002		0.0000	
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Estimated Volume of oil on open water, V _{wet} 0.00 m³ Estimated Volume of oil on open water, V _{wet} 0.00 bbis Separation of evaporated volume		0.1	1	0.0000	
Estimated Volume of oll on open water, V _{inst} Let a continue to the contin	Black oil	C.1		!	
Estimated Volume of oil on open water, V _{mat} Ulation of evaporated volume Evaporation Factors (E-Factor) for SPDC Crude oil Oil type	Black oil	1	0%	0.0000	
Residence time of spilled oil (days on site) Oil type Bonny Light Bonny Medium	<u>Biack oil</u> Emulsion (30% Oil)	1 Percent Total:	0%	0.0000	0 00 m³
Evaporation Factors (E-Factor) for SPDC Crude oil Residence time of spilled oil (days on site) Cil type Bonny Light Bonny Medium 10% 5% 1-7 days 25% 15% > 7 days 40% 25% Was oil recovery before JIV completion done before JIV date? Estimated volume available for evaporation E-factor Cil type Bonny Medium 10% 5% 15% 25% 15% 25% 15% 25% 15% 25% 15% 25% 25%	<u>Biack oil</u> <u>Emulsion (30% Oil)</u> Estimated Volume of oll	Percent Total: on open water, V _{wat}	0%	0.0000	
Residence time of spilled oil (days on site) Oil type	Black oil Emulsion (30% Oil) Estimated Volume of oll Estimated Volume of oll	on open water, V _{wat}	0%	0.0000	
Residence time of spilled oil (days on site) Bonny Light Bonny Medium	Black oil Emulsion (30% Oil) Estimated Volume of oll Estimated Volume of oll	on open water, V _{wat}	0%	0.0000	
Bonny Light Bonny Medium	Black oil Emulsion (30% Oil) Estimated Volume of oll Estimated Volume of oll	on open water, V _{wat} on open water, V _{wat}	SPDC Crude oil	0.0000 8.0000	
1-7 days 25% 15% > 7 days 40% 25% Was oil recovery before JIV completion done before JIV date? Estimated volume available for evaporation 8.97 bbls	Black oil Emulsion (30% Oil) Estimated Volume of oll Estimated Volume of oll Istimated Volume of oll	1 Percent Total: on open water, V _{wat} on open water, V _{wat} ume Evaporation Factors (E-Factor) for S	SPDC Crude oil	0.0000 8.0000	
> 7 days 40% 25% Was oil recovery before JIV completion done before JIV date? Estimated volume available for evaporation E-factor 40% 25% Mo ▼ 8.97 bbls	Black oil Emulsion (30% Oil) Estimated Volume of oll Estimated Volume of oll Istimated Volume of oll	1 Percent Total: on open water, V _{wat} on open water, V _{wat} ume Evaporation Factors (E-Factor) for S	PDC Crude oil 이 5 Bonny Light	0.0000 0.0000 pe Bonny Medium	
Was oil recovery before JIV completion done before JIV date? Estimated volume available for evaporation E-factor Mo 8.97 bbls	Black oil Emulsion (30% Oil) Estimated Volume of oll Estimated Volume of oll Istimated Volume of oll	on open water, V _{wat} on open water, V _{wat} on open water, V _{wat} ume Evaporation Factors (E-Factor) for S e of spilled oil (days on site)	PDC Crude oil 이 5 Bonny Light	0.0000 0.0000 pe Bonny Medium	
Estimated volume available for evaporation 8.97 bbls E-factor 40 %	Black oil Emulsion (30% Oil) Eetimated Volume of oll Eetimated Volume of oll Illuminated Volume of oll	1 Percent Total: on open water, V _{wat} on open water, V _{wat} ume Evaporation Factors (E-Factor) for S e of spilled oil (days on site)	SPDC Crude oil Oil ty Bonny Light 10%	pe Bonny Medium 5%	
E-factor 40%	Black oil Emulsion (30% Oil) Eetimated Volume of oll Eetimated Volume of oll Illuminated Volume of oll	1 Percent Total: on open water, V _{wat} on open water, V _{wat} ume Evaporation Factors (E-Factor) for S e of spilled oil (days on site) < 1 day 1-7 days	SPDC Crude oil Oil ty Bonny Light 10% 25%	0,0000 8,0000 pe Bonny Medium 5% 15%	
<u></u>	Black oil Emulsion (30% Oil) Estimated Volume of oil Estimated Volume of oil Ilation of evaporated vol Residence time	on open water, V _{wat} on open water, V _{wat} on open water, V _{wat} ume Evaporation Factors (E-Factor) for S e of spilled oil (days on site) < 1 day 1-7 days > 7 days	SPDC Crude oil Oil ty Bonny Light 10% 25%	0,0000 8,0000 pe Bonny Medium 5% 15%	0.00 bbls
Estimated Volume of evaporated oil, V _{even}	Black oil Emulsion (30% Oil) Estimated Volume of oll Estimated Volume of oll Ilation of evaporated vol Residence time	on open water, V _{wat} on open water, V _{wat} on open water, V _{wat} ume Evaporation Factors (E-Factor) for S e of spilled oil (days on site) < 1 day 1-7 days > 7 days	SPDC Crude oil Oil ty Bonny Light 10% 25%	0,0000 8,0000 pe Bonny Medium 5% 15%	0.00 bbls
	Black oil Emulsion (30% Oil) Estimated Volume of oil Estimated Volume of oil Residence time Was oil recovery before Ji Estimated volume availabi	on open water, V _{wat} on open water, V _{wat} on open water, V _{wat} ume Evaporation Factors (E-Factor) for S e of spilled oil (days on site) < 1 day 1-7 days > 7 days	SPDC Crude oil Oil ty Bonny Light 10% 25%	0,0000 8,0000 pe Bonny Medium 5% 15%	0.00 bbls No 8.97 bbls

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 1230972 JIV report S/N: 00701

23. GENERAL STATUS OF THE SITE

	Α.	Joint investigation of the incident site found that there is no residual impact after the initial
İ		response and JIT therefore recommend that the site be closed out.
Ì		·
I	В.	Investigation of the incident site showed that there is residual impact on site requiring further
I		works 🔽
I		

24. REPRESENTATIVES

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

- Host Community:
- Department of Petrolcum Resources [DPR]:
- National Oil Spill Detection and Response Agency [NOSDRA]:
- State Ministry of Environment [SME]:
- Nigeria Police Force [NPF]:
- Shell Petroleum Development Company [SPDC]:
- Signatories agree with reported findings:
- Separate DPR form has been filled out with same findings

Tick as applicable

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 1230972 JIV report S/N: 00/01

25. Appendix 1: Overview sketch of the site

