THE	SHELL PETROLEUM (DEVELOPMENT COM	SE JIV report S/N:
OINT INVESTIG	ATION REPORT FOR INCI	DENT NO:_100T	S C JIV report S/N:
(Note: As prac	cticable as possible the JIT rep	port is to be signed in the f	ield by all the participating parties)
A. GENERA	L INFORMATION:		
1. Spill incide	int Number: <u>98845</u>	2.Type o	fincident* OIL SPILL
3. Name of La	ocation 28" Bomu	-BONNY TRA	INS NIGER PIPELINE
4. Name of ne	earest community Photo	WEST 5. State: PIN	BES 6. LGA GO KATA
7. Type of Pro	oduction facility/Installation	PURLIME · 8.A	sset owner/District PLPGLINE SWMP
B. INCIDEN	T INFORMATION:		
b. Start c. Inves	of incident: ("JUNE, the date/time of investigation: ST stigation End date: 28 TH T	une, 2013 Actual inves	いる tigation duration, days: <u>Tいい(2) な</u> れる
	cription of spill point environm firmed soil	Loose soil	Recently excavated area
	urmed sou Inder water	Swampy	Exposed pipe surface
_		Swampy	Drill Rig
	Vell Platform (on Water) cription of leak point (tick as a	oplicable):	Dona Rig
	Orilled hole	Hack saw cut	☐ Tear (),
<u> </u>	Complete Rupture	☐Inward dent,	☐Well head tampering
	ailed Weld-on illegal hot tap valve		☐Missing Pipeline/Flowline
	rude oil theft (illegal bunkerin		☐Third party tampering with Clamp
	Third party tampering with valv		☐ Third party tampering with flange,
	Corrosion		☐Surge vessel overflow,
	Bulging Outward		all failure Accidental 3rd party equipment
imp	act	com	unit failure
	Relief valve failure	Others (specify)	
Thir		□; crude theft□; Line the	ft□; Accidental 3 rd party damage□)
g. Spil	Il point coordinates Measuring unit MC764	(MINHA MI	D-BE(T)
-	Northing:		Easting:
;	632a	0.78	532318.54
	γ <i>γ γ γ γ γ γ γ γ γ γ</i>	- , -	-

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMTED. JOINT INVESTIGATION REPORT FOR INCIDENT NO: 988456 JIV report S/N: C. RISK ASSESSMENT 10. Type of environment: Land □Water ☐ Seasonal swamp☐ Shoreline/Waterfront Type of environment to which oil has spread: Swamp River (identify)___ □water Land ii. Weather condition Rain \square_{Dry} □Wet □Windy □Hot Cool 11. Distance from the nearest sensitive habitat ☐ Government reserved and designated protected area NONE SEEM Drinking water source ☐ Built up area ,m] □ Farmlands ,m] □ Fish Farm/Pond □ Fishing net ☐ Others (specify). 12. Containment measures put in place; **⊠**Pit Booms □ Dyke ☐ Natural depression Trench Others: 13. Any pictures or video coverage? [Y] 14. Was there any disruption to the investigation? If yes give brief description: D. TYPE/NUMBERS OF PROPERTIES, IF ANY, FOUND WITHIN THE AREA OF SPREAD OF OIL 15. Structures / Properties Comments Size Number Type of Structures Description

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMTED. JOINT INVESTIGATION REPORT FOR INCIDENT NO: 188 456 JIV report S/N: 0149 16. Crops/Economic Trees Type of crops Young Medium Matured **Ouantity** Comments 17. Fish/Nets/Ponds Fish/Nets/Ponds Description Quantity/Size | Comments 18. Others (Specify) i.e. Animal Traps Quantity/Size Description Comments Others 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) VIEW OF 28" BOMNI-BONNY TRANS MIGER PIPELINE SHOWING 6" FLANGE BAIL YAIVE PATTING INSTALLED. LEAK FROM 6" FLANGE RAH VALUE FITTING OF BUNKERING, INSTALLED AT 12° CLECK POSITION ON 28" Boma - Bound TN? AT BODO WEST.

Bomu - Bonny. PIPELINE.

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

19. Impacted area bour	dary Coordinates (If more,	Print and attach as an appendix)

Northing (METER) Easting (METER)	
63202·43 532333·97 63195·52 532333·97 63187·82 532327·54 63189·33 532318·73	
63202·43 532333·97 63195·52 532333·97 63187·82 532327·54 63189·33 532318·73	
63187·82 532327·54 63189·33 532318·73	
63189.33 532318.73	
63189.33 532318.73	
63189.33 532306.66	
63198.86 532 308.89	
63206.87 532311.43	
63211.80 532312.78	
63210.68 532321.19	

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G. INCIDENT INFORMATION:	
20. Impacted Area Details	
•	
Total calculated area of impact Impact within SPDC R.O.W Tes	
Impact within SPDC R.O.W 7ES	
Impact outside SPDC R.O.W	
21. Volume of oil recovered before completion of JIV (V _{recj}):	
Recovered oil V _{recl} : HIL Barrels	
22. Computation of estimated residual volume on site	
 a. Computation of estimated volume of pool of free phase oil (on land or confined water body). i. Area (m²) occupied by pool of free phase oil	
ii. Average Depth (m) of pool of free phase oil O. 657 m	
iii. Emulsification factor: 36 %	
iv. Estimated Volume of pool of free phase oil. V _{pool} : barrels	
 b. Computation of estimated volume of infiltrated oil in the soil (V_{inf}). 1. Estimated Volume of infiltrated oil at spill point (Vinf a) 	
i. Area" (m') of soil covered by the oil:	
ii. Average Depth (m) above leaking facility i.e. pipeline/flowline: 1-2 m	
iii. Soil type: $CLAY$ iv. P_c (effective porosity of the soil). $8^{-\frac{1}{2}}$	
v. Cause of spill: THED INCTY vi. Oil type: BONHOT MEDIUM	
vii. Oil Residence time on site, day. (2) Took DATS	
viii. Average depth of infiltration below leaking facility i.e. pipeline/flowline: 0. 8003 m	
ix. Estimated depth of infiltration around spill point: 1, 2563 m	
Estimated Volume of infiltrated oil at spill point. V _{inf_a} : 4.83 barrel	ŝ
2. Estimated Volume of infiltrated oil at second spill point [if applicable] (Vinf b)	
i. Area* (m²) of soil covered by the oil:	
ii. Average Depth (m) above leaking facility i.e. pipeline/flowline: Nu_	
iii. Soil type: NtL iv. Pe (effective porosity of the soil). NtL	
v. Cause of spill: NIL vi. Oil type: NIL	
vii. Oil Residence time on site, day:	
viii. Average depth of infiltration below leaking facility i.e. pipeline/flowline:	
ix. Estimated depth of infiltration around spill point: NIL	
Estimated Volume of infiltrated oil at spill point. Vint_b: No TAPPLICABLE barrels	

3. Estimated Volume of infiltrated oil outside immediate spill point(s) region (Vinf c)

INVESTIGATION F				_ JIV report S/N:			
		covered by the oil: _					
		ool of free phase oil					
	Average Depth (m) below ground surface of infiltration of oil: 5.6063 m						
	Soil type: CLA						
v .	P_{c} (effective poros	sity of the soil)	8%				
٧	ri. Estimat	ed Volume of infiltr	ated oil. At Vinf	6.6	7 barrels		
23 Computation	of estimated vo	lume of oil on ope	n water based :	on standard color:	ation.		
_	of oil on open wat	k 4					
	•	l on water based on		- **Spill Factors from Edition)	USCG FOG (2000		
	Thickness	Percentage	Volume (m2)	·			
Barely Visible	0.00004	coverage	Volume (m3)				
Silvery	0.00008			11-110	C		
Slight Color	0.00015	NOI		MONE WITHIN VICINI	と下でと		
Bright Color	0.0003			, ,			
Dull	0.001	ADDIC	AR CE	MILHIE	1		
Dark	0.002	7010		Maran	T\		
Black oil	0.1			AICIM	٠, ۲		
Emulsion (30% Oil)	ļ, l						
Entained (50% Oil)	Percent Total	100%					
iii.		me of oil on open wa	iter. V _{wat} :	MIL	Barrels		
24. Calculation of	of evaporated vo	olume:					
	mated Volume a	vailable for evapor	ration within s	ırface area:	f8 Baccels		
iii.		olume of evaporated	oil. V _{evap} :	11/4-	Barrels		
		(E-Factor) for SPI	Crude oil Bonny Medi	ium			
Oil Type Oil Residence time	<pre>Cl day</pre>			5%			
OH KESKICHEC HINE	1-7 days	25%		5%			
	> 7 days	40%	25%				
25. Net Estima	ted Spilled Vol	$\frac{\text{lume } V_{Est}(\text{bbls})}{+ N_{1}L + 4}$	$V_{evap}(bbls) +$	V_{wat} (bbls) + V_{in}	$_{\rm f}$ (bbls) + $V_{\rm pool}$		
(bbbla) + 1/	(Bblc)		20 · 1.5	~ Alu ~	/ / Z Kw		

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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 $(m3) \times 6.29$; **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.

26. GENERAL STATUS OF THE SITE

- A. 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
- B. Investigation of the incident site showed that there is residual impact on site requiring further works

27. REPRESENTATIVES

This report was filled, agreed and signed on the $\frac{28/56}{2013}$ by joint investigation representatives from

- Host Community: □
- Department of Petroleum 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

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28. Appendix 1: Overview sketch of the site

