	HIGATION REPORT FOR INC	IDEIAL IAO'T to L. L.	2 <u>73</u> JIV report S/N: 00669
			eld by all the participating parties)
A. GENI	ERAL INFORMATION:	~~·	•
1. Spill is	ncident Number: 2442	73 2.Type of	fincident* OIL SPILL
3. Name	of Location 16" TUNU-	BRASS CRE	EK PIPELINE
4. Name	of nearest community AGBID	IAMA_5, State: BAY	ELSA 6. LGA EKEREMOR
<b>7.</b> Турс с	of Production facility/Installation	IL PIPELINE 8, AS	set owner/District PIPELINES
	DENT INFORMATION:		
a.		EMBER, 2014	- W 0 5100
			,2014 AT 1435HRS
·c.	Investigation End date: 24" St	EPTEMBE Actual invest	tigation duration, days: 2 DAYS
d.	Description of spill point environn	nent	
	☐Firmed soil	Loose soil	Recently excavated area
	☐Under water	<b>☑</b> Swampy	Exposed pipe surface
	_		
	☐Well Platform (on Water)	·	□Drill Rig
ME	itional observations around the spi	OT - TAP VALVE	LIDAIN RIG AVATION, A 4" FAILED E WAS GBSERVED ON THE AT 12 0' (LOCK POSITION
16'	itional observations around the spi	ot - Tap valve eek pipeline ,	AVATION, A 4" FAILED E WAS OBSERVED ON THE
16'	itional observations around the spi LD-DN ILLEGAL IH TUNU — BRASS CRE	ot - Tap valve eek pipeline ,	AVATION, A 4" FAILED E WAS GBSERVED ON THE AT 12 0' (LOCK POSITION)
16'	itional observations around the spitule of leak point (tick as a Dominated hole	OT - TAP VALVE  EEK PIPELINE  Applicable);  UHack saw cut  UInward dent,	AVATION, A 4" FAILED  E WAS OBSERVED ON THE  AT 12 0' (LOCK POSITION  Tear (),  Well head tampering
16'	itional observations around the spitule of the spitule of leak point (tick as a Drilled hole Complete Rupture Office of the spitule of the sp	of TAP VALVE  EFK PIPELINE  applicable);  Hack saw cut  Inward dent,  c, Failed Clamp	AVATION, A 4" FAILED  WAS GBSERVED ON THE  AT 12 0' (Lock Posttion)  Tear(),  Well head tampering  Missing Pipeline/Flowline
16'	itional observations around the spitule of the spitule of leak point (tick as a Drilled hole Complete Rupture Fajled Weld-on illegal hot tap valve of the spitule of the sp	applicable);  Hack saw cut  Inward dent,  oc,  Failed Clamp  ang) point,	AVATION, A 4" FAILED  E WAS OBSERVED ON THE  AT 12 0' (Lock Position)  Tear (),  Well head tampering  Missing Pipeline/Flowline  Third party tampering with Clamp
16'	itional observations around the spiritional observations around the spiritional observations around the spiritional observations of LEGAL INTURY BRASE (REDEATED TO THE AREASE)  Description of leak point (tick as a Drilled hole  Description of leak point (tick as a Drilled hole  Complete Rupture  Project Weld-on illegal hot tap valve oil theft (illegal bunkering)  Third party tampering with values.	OT - TAP VALVE  EEK PIPELINE  Applicable);  Chack saw cut  Chack s	AVATION, A 4" FAILED  E WAS OBSERVED ON THE  AT 12 0' (Lock Position)  Tear
16'	itional observations around the spinical content of leak point (tick as a Description of leak point (tick as a Drilled hole Complete Rupture Failed Weld-on illegal hot tap valve Crude oil thest (illegal bunkering Third party tampering with value Corrosión	of TAP VALVE  applicable);  Hack saw cut  Inward dent,  ve, Failed Clamp  ng) point,  ve setting,  Saver-pit over flow,	AVATION, A 4" FAILED  WAS GBSERVED ON THE  AT 12 0' (Lock Position)  Tear  Well head tampering  Missing Pipeline/Flowline  Third party tampering with Clamp  Third party tampering with flange,  Surge vessel overflow,
16'	itional observations around the spiritional observations around the spirition of LLEGAL ICTURY - BRASS (REDEATED TUNY - BRASS (REDEATED T	applicable);  Ap	AVATION, A 4" FAILED  E WAS OBSERVED ON THE  AT 12 0' (Lock Position)  Tear
16'	itional observations around the spiritional observations around the spirition of ILLEGAL IGN  Description of leak point (tick as a Drilled hole  Complete Rupture  Fajled Weld-on illegal hot tap valve oil theft (illegal bunkering Third party tampering with value)  Corrosión  Bulging Outward impact  Valve Failure	applicable);  applicable);  Hack saw cut  Inward dent,  ve, Failed Clamp  ng) point,  ve setting,  Saver-pit over flow,  Flare System/Bund was  Com	AVATION, A 4" FAILED  E WAS GBSERVED ON THE  AT 12 0' (Lock POSITION)  Tear (),  Well head tampering  Missing Pipeline/Flowline  Third party tampering with Clamp  Third party tampering with flange,  Surge vessel overflow,  all failure Accidental 3rd party equipment  unit failure Cold vent
16'	itional observations around the spiritional observations around the spirition of LLEGAL ICTURY - BRASS (REDEATED TUNY - BRASS (REDEATED T	applicable);  Ap	AVATION, A 4" FAILED  E WAS GBSERVED ON THE  AT 12 0' (Lock POSITION)  Tear (),  Well head tampering  Missing Pipeline/Flowline  Third party tampering with Clamp  Third party tampering with flange,  Surge vessel overflow,  all failure Accidental 3rd party equipment  unit failure Cold vent
l6'	itional observations around the spinitional observations around the spinit LD - ON ILLEGAL INTURY - BRASE CREDENT - BRASE CREDIT - BRASE CREDENT - BRASE CREDE	applicable);  applicable);  Hack saw cut  Inward dent,  e, Failed Clamp  ng) point,  ve setting,  Saver-pit over flow,  Flare System/Bund wa  Com  Others (specify)	AVATION, A 4" FAILED  E WAS GBSERVED ON THE  AT 12 0' (Lock Position)  Tear  Well head tampering  Missing Pipeline/Flowline  Third party tampering with Clamp  Third party tampering with flange,  Surge vessel overflow,  all failure Accidental 3rd party equipment  unit failure Cold vent
l6'	itional observations around the spin LD - ON ILLEGAL IN TUNU - BRASE CRED COMPLET OF TUNU - BRASE CRED CRED COMPLET OF TUNU - BRASE CRED CRED CRED CRED CRED CRED CRED CRE	applicable);  applicable);  Hack saw cut  Inward dent,  e, Failed Clamp  ng) point,  ve setting,  Saver-pit over flow,  Flare System/Bund wa  Com  Others (specify)	AVATION, A 4" FAILED  WAS GBSERVED ON THE  AT 12 0' (Lock POSITION)  Tear (),  Well head tampering  Missing Pipeline/Flowline  Third party tampering with Clamp  Third party tampering with flange,  Surge vessel overflow,  all failure Accidental 3rd party equipment  unit failure Cold vent

<sup>\*</sup>This can be: a) Oil Spill b) Drilling fluid/Chemical c) Siltation d) construction e) Encroachment f) Fire,

INT INVESTI	GATION RE	PORT FOR INC	IDENT NO:_	1244	<u>273</u> .	IIV repo	ort S/N: (	0066	9
g. Spi	Il point coord		·MU	lat.	(MEST	T-2	ELT)		
	Measuring Northing:	unit M_	<u>-yttr</u>	<u>ujujt</u>	Easting:				
		10170	0.09		35	04	17.	99_	
C. RISK A	SSESSME!	NT							
10.	Турс	of environment:		•					
Ľ	Land	□Swamp	□Water	₽€	asonal swa	mp⊡si	horeline/Wa	terfront	
	і. Турс о	f environment to v	vhich oil has s	pread:					
	Land	<b>⊠</b> Swamp	□Water	□R	ver (identif	ý)			
í	i. Weath	er condition							
	Rain stance from th	Sunny ne nearest sensitive	□Dry e habitat	Wet	□Win	dy	□Hot	□cool	l
0	Government Drinking we Built up are Farmlands Fish Farm/ Fishing net Others (spe	ea Pond	ignated prote	cted area	[ [	,m] ,m] ,m] ,m] ,m]	NON THE	IE WI	THHA
12. Co	ntainment m	casures put in plac	c;						
	]Booms Hothers: <u>C</u> 0	□Trench FFER —DAn	⊠Dyke \	□N	atural depre	ession	□Pit 1		None
13. Ar	y pictures or	video coverage?			W	[N]			
14. F	urther respon	se/repair initiated	as at the time	of JIV?	W	[N]			
If yes to item	ı 14, give briel	description: RE	COVERY	' 0F (	RULE	DIL	. ·Com	MEN C	ED Durin
JIV. B	EPAIR IS	BEING	PLANNED	·By TI	RE PIP	ह। ਇ।	ES MAI	NTENA	YCE TEAM
15. W	as there any o	disruption to the in	vestigation?		[Y]	W	•		
If yes to ite	m 15 give bri	ef description:	IOT AP	PLICA	BLE				
				<u> </u>			•		<del></del>

# THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMTED. JOINT INVESTIGATION REPORT FOR INCIDENT NO: 1244273 JIV report S/N: 00669

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
<b>—</b>			1 1 1		1 0 4 C
<b>—</b>	NONE L	1777	1-1X	<del>-//                                   </del>	11 A CT

#### 17. Crops/Economic Trees

S/N	Type of crops	Young	Medium	Matured	Quantity	Comments
<u> </u>		<u> </u>				
<u></u>	NONE	-121-THN	-A-R	<del> </del>	-, -M <i>P</i> ,A-(	<del></del>
<del> </del>	140	Val I filia	11700	' VI	<del></del>	

#### 18. Fish/Nets/Ponds

S/N	Fish/Nets/Ponds	Description	-Quantity/Size	Comments
<u> </u>			•	
<u> </u>			1051	LC MONT
<u> </u>	14014	MILLIM		UP INITION
				•

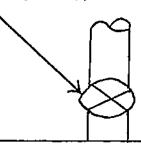
#### 19. Others (Specify) i.e. Animal Trans

S/N	Others	Description	Quantity/Size	Comments
			28	
ļ	-A-MALE	I TILL A		EIMPACT
	140146	IMI ITIM 711		TIME

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)

4" FALLED WELD-ON ICLEGAL HOT-TAP VALVE AT 12 O'CLOCK

POSITION.



JOINT INVESTIGATION REPORT FOR INCIDENT NO: 1244273 JIV report S/N: 00669

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)

MINIA (WETT BELT)

	MINNY (ME	SI BELT)
S/N	Northing (M)	Easting (M)
	101600.1	350407.4
	101656.7	350407.4
	101700.1	350407·4 350411·8
	101700.1	350413.7
	101703.2	350421.1
	101697.	350424.1
	101654	350424·1 350434·8
	101599.5	350435.5
	101599.5	350435.5
	101449	350 460
	101343.8	350474.8
	101271	350485.4
	101164.	350505.3
-	0 058.3	350519.5
<del></del>	101055.1	350501.2
	10/167.3	350480.2
<del> </del>	101271	350457.1
	101345.4	350 445 . 4
	101449.3	350428.9
<u> </u>	101600.1	350407.4
	101698.6	3504-20-2
		350420-1
	101702.2	350415.9
	101698.7	350415.7
<u> </u>	101010	
1		

# ESTIMATION OF OIL SPILL VOLUME

OIL SPILLED ONSHORE	E/OFFSHORE (Leak stopped at	source)		
Impacted Area Dotails				
Total Calculated Area o	f Impact			17,846.00 m²
i Impact within SPDC R.O	.w			m²
il Impact outside SPDC R.	O.W			m²
Volume of all recovered bef				
i Estimated Recovered oil	(Net)			0.00 bbis
Estimated Recovered o	fl (Nat) V <sub>rect</sub>			0,00 bbis
Computation of estimated re	seldus I voluma on elto			
	o of free phase oil (on land or confine	d water bodyl		
i Total area occupied by p				2,400.00 m²
ii Average depth of pool of				0.001 m
iii Emulsification factor	(If applicable, else 0%)			40 %
Estimated Volume of n	ool of free phase oil, V <sub>ecol</sub>			1,44 m³
	ool of free phase oil, V <sub>pool</sub>			9.06 bbls
		-		
b Computation of estima	ted volume of infiltrated oil in the soi	I (V <sub>ht</sub> )		
1 Volume of Infiltrated of				
i Total area covered by the				0.00 m²
	on above feaking facility i.e. pipeline/flo	Mine		0.000 m
iii <u>Soil lype</u>				- Select - ▼
iv P. (effective porosity of t	ne soil)			0 %
v Cause of spill				Third party interference ▼
vi Calculation of days for	or infiltration below the leaking point on p	olpeline or flowline		
Incident Date	JIV Date	Days on Site		
9/4/2014 13:40	9/24/2014 14:45	20		
	erational , use 1 week as worst case where 'days on site' exceeds 7.	7		
	f=845-47			٦
Soil type	Infiltration of oil types In various soil in Approximate time to reach	~	ad form	-
Oil type	Sand	Losm	Clay	-
Bonny Medium	3 weeks	3 years	> 10 years	1
Bonny Light	2 days	2 months	> 10 years	<u> </u>
vii Oil type		. O		Bonny Medium
viii Average depth of infiltrat	on below leaking facility i.e. pipeline/flov	Mille		0.000 m
ix Total depth below ground	surface of infiltration of oil			0.000 m
in Total asper balon ground				5,555
Estimated Volume of In	filtrated oil. V			0.00 m³
Estimated Volume of in				eldd 00.0
•				
2 Volume of Infiltrated of	l at second spli1 point [if applicable] (	(V <sub>Inf b</sub> )		
i Total area covered by the	oil (infiltration)			m²
ii Average depth of infiltrati	on above leaking facility i.e. pipeline/flo	wline		m
iii <u>Soil type</u>				- Select - ▼
iv P. (effective porosity of the	ne soil)			0 %
v Average depth of infiltrati	on below feaking facility i.e. pipeline/flov	vline		0.000]m

JOINT INVESTIGATION REPORT SPILL VOLUME ESTIMATE FOR INCIDENT NO: 1244273

vi Total depth below ground surface of	finfiltration of oil			0.000 m
Estimated Volume of Inflitrated o	II V			0.00 m³
Estimated Volume of Infiltrated o				0,00 bbls
				4544 14454
3 Volume of Inflitrated oil outside in	mmodlate spill point(s) reg	ion (V <sub>Me</sub> )		
i Total Area covered by the oil (infiltra				m²
ii Total Area of the pool of free phase	•			m²
iii Soil type				- Select-
iv P. (effective porosity of the soil)				0 %
v Average depth below ground surfac	e of infiltration of oil			0.000 m
Estimated Volume of Inflitrated of	II, V <sub>infe</sub>			0.00 m³
Estimated Volume of Inflitrated of	li, V <sub>infe</sub>			0.00 bbis
4 Volume of Infiltrated oil outside in Total Area covered by the oil (Infiltrati Total Area of the pool of free phase iii Average depth below ground surface Estimated Volume of Infiltrated oil Estimated Volume of Infiltrated oil Estimated Total Volume of Infiltrated oil Estimated Total Volume of Infiltrated Computation of Volume of Infiltrated Computation of Volume of Infiltrated Computation of Volume of Infiltrated Infilt	ilion) oil in touch with soil e of infiltration of oil il, V <sub>inf d</sub> touch vith soil il, V <sub>inf d</sub> ted oil, V <sub>inf</sub> ted oil, V <sub>inf</sub>	dard coloration		0.005 m  0.00 m³  0.00 bbis  0.00 m²  0.00 bbis
C. 11 C		Link to Coverage Visual		
Spill Factors from USCG FOG (2000 Editlo	nj	Ald Percentage coverage		1
	Thickness (mm)	(%)	Votume (m3)	
Barely Visible	0.00004	25%	0.0002	
Silvery	0.0000.0	35%	0.0004	
Slight Color	0.00015		0.0000	
Bright Color	0.0003	15%	0.0007	
Dult	0.001		0.0000	
Dark	0.002		0.0031	
Black oil	0.1	10%	0.1545	
Emulsion (30% Oil)	1		0.2317	
	Percent Total:	100%	0,3905	
				•
Estimated Volume of oil on open				0,39 m³
Estimated Volume of oil on open	water, V <sub>wat</sub>			2.46 bb/s

### 3 Calculation of evaporated volume

Evaporation Factors (E-Factor) for SPDC Crude oil				
Residence time of spilled oit (days on site)	Oil t	урв		
Residence time of spilled on (days on site)	Bonny Light	Bonny Medium		
< 1 day	10%	5%		
1-7 days	25%	15%		
> 7 days	40%	25%		

JOINT INVESTIGATION REPORT SPILL VOLUME ESTIMATE FOR INCIDENT NO: 1244273

ii Estimated volume available for evaporation	11.51 bbls
iii E-factor	25 %
Estimated Volume of evaporated oil, V <sub>evap</sub>	3,84 bbis
Net Total Estimated Spilled Volume, V <sub>Est</sub>	, 15.35 bbls

# THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMTED. JIV report S/N: 00669 JOINT INVESTIGATION REPORT FOR INCIDENT NO: G. INCIDENT INFORMATION: 20. Impacted Area Details Total calculated area of impact Impact within SPDC R.O.W Impact outside SPDC R.O.W 21. Volume of oil recovered before completion of JIV (Vreel): Recovered oil Vreet Barrels Controlled recovery/evacuation from source with no impact to environment: Barrels timatediSpilled Volume Ven (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 in the box below:

Calculation of the respective estimated volume is to be done on site as for as practicable using the new spill volume estimation software on site; Conversion of m<sup>1</sup> 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 I bbi 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.

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 1244273 JIV report S/N: 00669

# 23. GENERAL STATUS OF THE SITE

Α.	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
В.	Investigation of the incident site showed that there is residual impact on site requiring further works

#### 24. REPRESENTATIVES

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

- Host Community: 

  ✓
- Department of Petroleum Resources [DPR]: □
- 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: 1244273 JIV report S/N: 00669

25. Appendix 1: Overview sketch of the site

Location : 6	TUNU-BRASS CREEK PIPELINE AT AGBIDIAMA
	SPILL POINT  COFFER - DAM  WITH FREE PHASE  CRUDE OIL INSIDE  CRUDE OIL  CRUDE OIL  CRUDE OIL  CRUDE OIL
	OIL SHEEN ON SURFACE WATER
	K-SPOC - ROW