#### THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED JOINT INVESTIGATION REPORT FOR INCIDENT NO: $\underline{-9511}$ (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: 883053 2. Type of incident \* OIL SPILL 3. Name of Location 20 INCH OTUMARA - ESCRAVOS PIPELINE AT ESCRAVOS 4. Name of nearest community ADJUDIABO 5. State: DELTA 6. LGA WARRI - SOUTH WEST 7. Type of Production facility/Installation IRUNKLINE 8. Asset owner/ District PIPELINE **B. INCIDENT INFORMATION:** a. Date of incident: 24/10/20/2 9 Details of incident b. Start date/time of investigation: 25TH AND 30TH OCTOBER, 2012. c. Investigation End date: 30 1012012 d. Description of spill point environment ☐Firmed soil ☐Loose soil Previously excavated area Swampy Under water Exposed pipe surface Well Plateform (on Water) $\square_{Rig}$ e. Description of leak point (tick as applicable); Drilled hole Hack saw cut Explosive tear, Complete Rupture Inward dent, ☐ Well head tampering Failed Weld-on illegal hot tap valve, ☐ Missing Pipeline/Flowline) Crude oil theft (illegal) bunkering) point, ☐ Third party tampering with Clamp Third party tampering with valve setting, ☐ Third party tampering with flange, Corrosion ☐Saver-pit over flow, ☐ Surge vessel overflow Outward dent ☐Flare System/Bund wall failure □Valve Failure Com unit failure Cold vent Relief valve failure Others (specify) f. Incident caused by: Third party interference Operational □Mystery\_ g. Spill point coordinates Measuring unit Northing: Easting:

Page 1 of 9

308**99**98m

173403m

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

#### THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED JOINT INVESTIGATION REPORT FOR INCIDENT NO:\_\_\_ C. RISK ASSESSMENT 10. Type of environment: Swamp □ Land □ Water ☐ Seasonal swamp Type of environment to which oil has spread: Swamp Water □ Land ☐ River (identify)\_\_\_\_ Weather condition Sunny □ Raining 11. Distance from the nearest sensitive habitat ☐ Government reserved and designated protected area m] ☐ Drinking water source [m, ☐ Built up area ,m]☐ Farmlands [m, ☐ Fish Farm/Pond ☐ Fishing net [m, ☐ Others (specify). 12. Containment measures put in place; Booms ☐ Trench □ Dyke ☐ Others:\_\_\_\_ 13. Any pictures or video coverage? 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 Type of Structures Description Number

## THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0511 8 3 3 5 3

#### 16. Crops/Economic Trees

S/N	Type of crops	Young	Medium	Matured	Quantity	Comments
	PALM TREES		YES			/
	MANGROVE	VE3		7ES		
						7
						<u> </u>

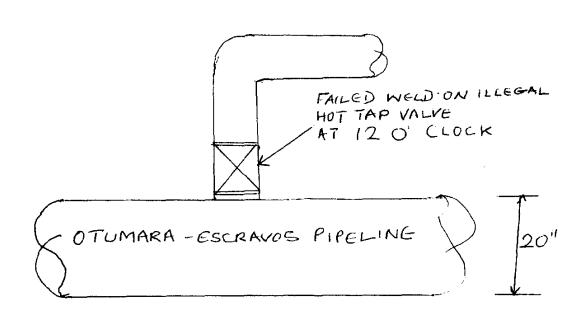
#### 17. Fish/Nets/Ponds

S/N	Fish/Nets/	Ponds_	Descript	ion	Quantity/	Size	Comme	nts
N	ONE	Wr	HIM	ARCI	OF	1 n	PAC.	T

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

S/N Others	Description	Quantity/Size	Comments
NONE V	UTHIN AR	EA OF IN	PACT

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)



## THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0511 883053

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

19. Impacted area boundary Coordinates (If more than 12 points, Attach as an appendix 2)

S/N	Northing	Easting
SP	173403	308898
	173394	308 912
	173398	308898
	173 401	308883
	173767	308983
	173762	309008
	173767	308 983
	173773	308961
	173948	309050
	173979	309058
	173966	309076
	173985	309079
	173938	309071

#### G. INCIDENT INFORMATION:

20. Impacted Area Details

	-			
	<ul> <li>Total calculated area of impact</li> <li>Impact within SPDC R.O.W</li> <li>Impact outside R.O.W</li> </ul>	248,58 26,95 221,6	5 12 m <sup>2</sup> 5 64 m <sup>2</sup> 29 48 m <sup>2</sup>	
21.	Volume of oil recovered before comp	letion of JIV (Vree J).		
	Reco	vered oil V <sub>rec.</sub> r.	NiL	barrels
20.	Computation of the residual volume of	on site		
a.	Computation of volume of pool of free pl		water body).	
	i. Area (m²) occupied by pool		1	
	ii. Average Depth (m) of pool	of free phase oil NO 1	AMPLICAB	LE

THE SHELL PE	TROLEUM DE	EVELOPMENT C	OMPA	NY OF N	IGERIA	LIMITE	2 ~ 5
JOINT INVES	TIGATION REP	ORT FOR INCIDE	NT NO	. 8	511	せん しんしん かんしん かんしん しんしん しんしん しんしん しんしん しん	<i>3</i> 05 <i>≯</i>
33111 111722		APPLICABI		·			
iii, Emulsification f	actor: NU /	MI LICA BI					
iv.	Volume of	pool of free phase oil	. V <sub>poot</sub> :			Ni	L barrels
b. Computation of	of volume of infilt	rated oil in the soil (	V <sub>inf</sub> ).				
i	Area *(m²) co	vered by the oil:		li L			
ĺi	Area of the po	ol of free phase oil	in touch	with soil:	N	(L	
ii	i Average Dept	h (m) below ground	surface	of infiltratio	on of oil:	NOT AF	PLICABLE
į	Soil type: N	OT APPLICA	BLE		_		
v	P. (effective	porosity of the soil).	NOT	APPL	ICABI	LE.	
· •		of infiltrated oil. V					barrels
•	v. Volume (	or intriduction. V	1191			NI	
21. Computation	of volume of oil	on open water bas	sed on s	tandard eg	oloration.		
i. Total area o	foil on open water	r: <u>248,5</u>	85	12 M2	_		
ii. Table of aver	rage depth of oil o	n water based on color	ration • •				
	Thickness	Percentage	Ð				
r	(mm)	coverage		Volu	ıme (m	3)	
Barely Visible	0.00004	5%	<u>o</u>	0.00r	)47 II	102	
Silvery	0.00008	15%	<u> </u>	0.002	48 20.	214	
Slight Color	0.00015						
Bright Color	0.0003			A 5	7 6 79	3577	
Dull	0.001	5%	,	0.01	<u> </u>	2560	
Dark	0.002	1001		0.04	7 7 7 7 7	0240	
Black oil	0.1	209		1111	アノックス	<u>†                                     </u>	
Emulsion (30% Oil)	_1	45%	<del></del>	111.5	56330		an 77
	Percent Total		100%	Total	Volume	116	TUM 3
iii.		il on open water. \	/wat:			735	22 burrels
22. Calculation o	f evaporated vo	ume:					
	ype: BONNY						
ii. E-Fa	actor: 15°	<u>⁄o</u>					
iii.	Volume of e	vaporated oil. V evap:	<del>- T</del>		1	29.7	5 burrels
L		- Cith		<del></del>		<u> </u>	
Evapora	tion Factors (E-Fac	tor) for SPDC Crude	oil				
Oil Type	Days on site	Bonny Light	Bonny				
			Mediu				
Period Since Oil Spill	< 1 day	10%	5	%			
	1-7 days	25%	1:	5%			

Evaporation Factors (E-Factor) for SPDC Crude oil						
Oil Type	Days on site	Bonny Light	Bonny Medium			
Period Since Oil Spill	< 1 day	10%	5%			
	1-7 days	25%	15%			
	> 7 days	40%	25%			

<sup>\*</sup>If area is not same as the total area of impact, please indicate in the overview sketch

\*\*Spill Factor from USCG FOG (2000 Edition)

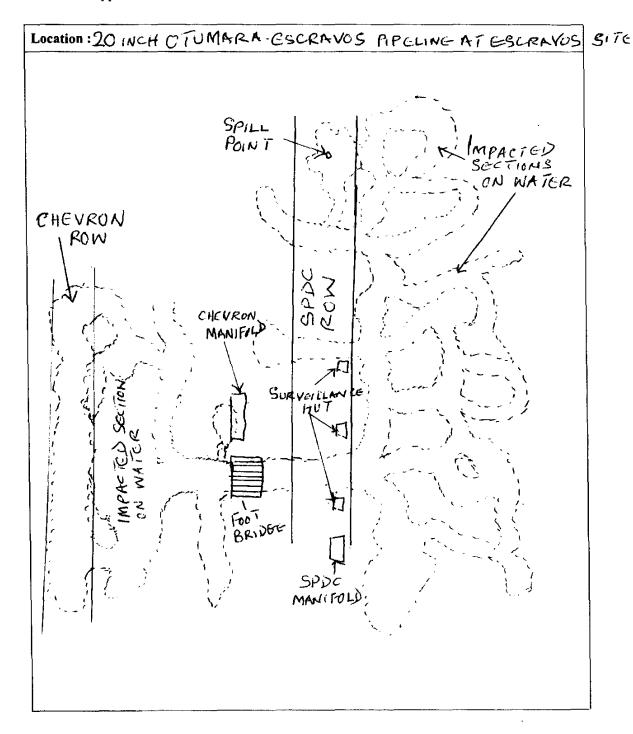
THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0511 8 3053 JOINT INVESTIGATION REPORT FOR INCIDENT NO:

23. Gross Total Estimated Spilled Volume
$\mathbf{V}_{\text{tst}}(\text{bbls}) \simeq \mathbf{V}_{\text{evap}}(\text{bbls}) + \mathbf{V}_{\text{set}}(\text{bbls}) + \mathbf{V}_{\text{post}}(\text{bbls}) + \mathbf{V}_{\text{post}}(\text{bbls}) + \mathbf{V}_{\text{text}}(\text{bbls})$
Via (bbls) 865 BBLS
24. Net Total Estimated Spilled Volume
$\mathbf{V}_{\text{fat}}(\text{bbls}) = \mathbf{V}_{\text{evap}}(\text{bbls}) + 0.6 \mathbf{V}_{\text{var}}(\text{bbls}) + \mathbf{V}_{\text{rot}}(\text{bbls}) + \mathbf{V}_{\text{pool}}(\text{bbls}) + \mathbf{V}_{\text{recl}}(\text{bbls})$
VEST(bbls)- 571 BBLS
*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 Total volume VT (m3) x 6.29
*Emulsification factor for spill on water to consider is 60% of volume of oil.
25. 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
26 REPRESENTATIVES
This report was filled and signed on the 25 \$30/10/20/2 at incident site by joint
investigation representatives from
and the state of
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]:
Tick as applicable

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0511883053

27. Appendix 1: Overview sketch of the site



### 21. Appendix 2:TABLE SHOWING ADDITIONAL COORDINATES TAKEN DURING JIV FOR AREA CALCULATION

S/N	Northing	Easting
	175538	309679
	175552	309544
	175218	309681
	175339	309381
	175249	309273
	175211	309 277
	175178	309205
	175182	309144
	174963	309205
	175208	309262
	175028	309201
	175099	309217
	175132	309201
	175164	309175
	175130	309206
	175081	309273
	174815	309 250
	174266	309030

JOINT INVESTIGATION REPO	RT FOR INCIDENT NO:	05/0
(Note: As practicable as possible the JIT re	port is to be signed in the	field by all the participating parties)
A. GENERAL INFORMATION:		
1. Spill incident Number: 8830		
3. Name of Location 20 INCH OT	UMARA -ESCRA	VOS PIPELINE AT SAGHARA
4. Name of nearest community UGB066	UNGUNS, State: DEL	7A 6. LGA WARRI SOUTH WEST
7. Type of Production facility/Installation 1		
B. INCIDENT INFORMATION:		
9. Details of incident  a. Date of incident: 24 10 2.  b. Start date/time of investigation: 2  c. Investigation End date: 25 10  d. Description of spill point environm	5/10/2012 AT	1310 HRS
Firmed soil	Loose soil	Previously excavated area
Under water	□Swampy	☐Exposed pipe surface
<ul> <li>Well Plateform (on Water)</li> <li>e. Description of leak point (tick as a</li> </ul>	nnlicable)	□Rig
☐ Drilled holc ☐ Complete Rupture	☐ Hack saw cut☐ Inward dent,	☐ Explosive tear, ☐ Well head tampering
Failed Weld-on illegal hot tap		☐ Missing Pipeline/Flowline)
☐Crude oil theft (illegal) bunker		☐ Third party tampering with Clamp
☐Third party tampering with val ☐Corrosion	_	☐ Third party tampering with flange,
Outward dent	☐ Saver-pit over flow, ☐ Flare System/Bund wa	Surge vessel overflow
□Valve Failure	Com unit failure	Cold vent
Relief valve failure	Others (specify)	Cold Veni
f. Incident caused by:  Third party interference	□Operational	□Mystery
g. Spill point coordinates  Measuring unit		
Northing:	Į.	Sasting:
179825m		304295m

Page 1 of 9

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

#### THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED JOINT INVESTIGATION REPORT FOR INCIDENT NO: C. RISK ASSESSMENT 10. Type of environment: □ Land □ Water ☐ Seasonal swamp Type of environment to which oil has spread: Land Swamp. □ Water ☐ River (identify) ii. Weather condition Sunny □ Raining 11. Distance from the nearest sensitive habitat ☐ Government reserved and designated protected area .m] ☐ Drinking water source ,m☐ Built up area ,m ☐ Farmlands ,m] ☐ Fish Farm/Pond .m] ☐ Fishing net ,m] ☐ Others (specify). 12. Containment measures put in place; □ Booms ☐ Trench □ Dyke □ Others:\_ 13. Any pictures or video coverage? 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 S/N Type of Structures Description Size Number Comments

# THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0510 8 305 3

#### 16. Crops/Economic Trees

S/N Type of crops	Young	Medium	Matured	Quantity	Comments
NONE	WITHIN	ARE	AOF	IMPA	CT

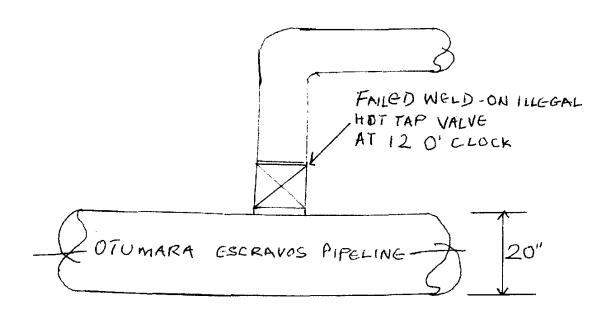
#### 17. Fish/Nets/Ponds

S/N	Fish/Nets/Ponds	Description	Quantity/Size	Comments
NO	NE WIT	HIM ARE	A OF IM	PACT

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

S/N Others	Description	Quantity/Size	Comments
NONE	WITHIN ARC	ea of Imi	ACT

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)



## THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0510883053

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

19. Impacted area boundary	Coordinates (If more than 1.	2 points, Attach as an appendix 2)
----------------------------	------------------------------	------------------------------------

S/N	Northing	Easting
ı	179825	304295
2	179827	304294
3_	179823	304295 304294 304284 304291 304293
4	179819	304291
5	179824	304293

#### G. INCIDENT INFORMATION:

20.	Impacted	Area	Details
-----	----------	------	---------

• Im	tal calculated area of impact  pact within SPDC R.O.W  pact outside R.O.W	52.56m²	
21. <u>Volume of</u>	oil recovered before completion of JIV (	V <sub>recJ</sub> ):	
	Recovered oil V <sub>rec</sub> r.	NIL	barrels
	on of the residual volume on site on of volume of pool of free phase oil (on land Area (m²) occupied by pool of free phase oil Average Depth (m) of pool of free phase oil	11_2m	-

THE SHELL PE	TROLEUM DE	EVELOPMENT (	COMPAN	Y OF NIGERIA	LIMITED
JOINT INVES	STIGATION REP	ORT FOR INCIDE	ENT NO:	0510 .	883053
iii, Emulsification	factor: NOT	APPLICAR	3LE		
iv.	Volume of	pool of free phase oi	l. V <sub>pool</sub> :		O · O barrels
b. Computation of	of volume of infilt	rated oil in the soil	(Ve).	<b>.</b> .	•
i		vered by the oil:		<u>51.36</u>	$M^2$
ii		ool of free phase oil			L
-	•	h (m) below ground			OIM
	v Soil type: C		surface of	minuación (1 on.	
•		porosity of the soil)	80	10	
ν					
. <b>.</b>	v. Volume o	of infiltrated oil. V	inf		2:58 barrels
21. Computation	of volume of oil	on open water ba	sed on sta	indard coloration	•
	of oil on open wate	- 4111			
ii. Table of ave	rage depth of oil o	n water based on colo	ration • •		
	Thickness	Percentag	_		
•	(mm)	coverage		Volume (m	3)
Barely Visible	0.00004	<u> </u>			
Silvery	0.00008		, Lie		
Slight Color			—— <b>,</b>	(b*	
Bright Color	0.0003				
Duli	0.001	/ XP	<i>\\</i> '+		
Dark j Black oil	0.002 0.1	101 10	·		
Emulsion (30% Oil)		Mo-			
Emulsion (30 % On)	Percent Total		100%	Total Volume	NII 3
` III. (		il on open water. \	٠.	Total volume	[N]  - [M]
			r waii		NI L barrels
22. Calculation of	·				
i. Oil t	ype: BONN	MEDIUM			
ii. E-Fa	ictor: 15%	0			
iii.	Volume of e	vaporated oil. V evap	:		0.46 barrels
		tor) for SPDC Crude			
Oil Type	Days on site	Bonny Light	Bonny Medium		
Period Since Oil	< 1 day	10%	5%		
Spill			<b></b>		
	1-7 days	25%	15%		
	> 7 days	40%	25%	)	

<sup>\*</sup>If area is not same as the total area of impact, please indicate in the overview sketch
\*\*Spill Factor from USCG FOG (2000 Edition)

IOINT INVESTIGATION REPORT FOR INCIDENT NO. 0510 £83053
JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0110 & 5 5 5
23. Gross Total Estimated Spilled Volume
$\mathbf{V}_{\text{rst}}(\text{bbls}) = \mathbf{V}_{\text{exap}}(\text{bbls}) + \mathbf{V}_{\text{set}}(\text{bbls}) + \mathbf{V}_{\text{post}}(\text{bbls}) + \mathbf{V}_{\text{rect}}(\text{bbls})$
Visitables 3 BBLs
24. Net Total Estimated Spilled Volume
$\mathbf{V}_{tst}(bbls) = \mathbf{V}_{evan}(bbls) + 0.6*\mathbf{V}_{wat}(bbls) + \mathbf{V}_{test}(bbls) + \mathbf{V}_{peal}(bbls) + \mathbf{V}_{rect}(bbls)$
VEST(bbls)= 3 BB Ls
*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 Total volume VT (m3) x 6.29
*Emulsification factor for spill on water to consider is 60% of volume of oil.
25. 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
26 REPRESENTATIVES  This report was filled and signed on the 2.5/10/2012 at incident site 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]:
Tick as applicable

JOINT INVESTIGATION REPORT FOR INCIDENT NO: $\mathbb{P}[\mathfrak{I},\mathfrak{I}] \in \mathfrak{I}$	8830	75_5
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27. Appendix 1: Overview sketch of the site

ocation : 20	INCH	OTUMARA	1-ESC	RAVOS	PIPELI	NE SPI	LL Si
		·					
•							
					SPAC	1	
		^	· · · · · · · · · · · · · · · · · · ·	IMPACTE	> \		
20 otum Pippell	iara-e ne	sca-Avosi	<u> </u>	IMPACTE - GECTION ON SOIL	\		
			KIMPAC	TED SECT ATER	DM		
							Ţ

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0510 88 505 2

### 21. Appendix 2:TABLE SHOWING ADDITIONAL COORDINATES TAKEN DURING JIV FOR AREA CALCULATION

S/N	Northing	Easting
	-	
	1	