

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0192 771945

(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: 771945 2. Type of incident* OIL SPILL
 3. Name of Location 6" OBIGBO NORTH PIPELINE
 4. Name of nearest community OGALE 5. State: RIVERS 6. LGA ELEME
 7. Type of Production facility/Installation PIPELINE 8. Asset owner/District NPE/PH I

B. INCIDENT INFORMATION:

9. Details of incident

- a. Date of incident: 1ST FEBRUARY, 2012.
 b. Date/Period of investigation: 3RD FEBRUARY, 2012

c. Description of spill point environment

- Firmed soil Loose soil Previously excavated area
 Under water Swampy Exposed pipe surface
 Well Platform (on Water) Rig

d. 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,
 External Corrosion Internal 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) _____

e. Incident due to:

- Third party interference Operational Others (specify) _____

f. Spill point coordinates

<u>MUNNA MUD BELT</u>	
Measuring unit	
Northing: (m)	Easting: (m)
<u>90765.44</u>	<u>521361.25</u>

*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: 0192771945

C. RISK ASSESSMENT

10. Type of environment:

- Land Swamp Water Seasonal swamp

i. Type of environment to which oil has spread:

- Land Swamp Water River (identify) _____

ii. Weather condition

- Raining Sunny

11. Distance from the nearest sensitive habitat

- Government reserved and designated protected area [,m]
 Drinking water source [,m]
 Built up area [,m]
 Farmlands [20 ,m]
 Fish Farm/Pond [,m]
 Fishing net [,m]
 Others (specify). [,m]

12. Containment measures put in place;

- Booms Trench Dyke

Others: NATURAL DEPRESSION

13. Any pictures or video coverage? [Y] [N]

14. Was there any disruption to the investigation? [Y] [N]

If yes give brief description:

NOT APPLICABLE

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
<u>NONE WITHIN AREA OF IMPACT</u>					

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0192771945

16. Crops/Economic Trees

S/N	Type of crops	Young	Medium	Matured	Quantity	Comments
	NONE WITHIN AREA OF IMPACT.					

17. Fish/Nets/Ponds

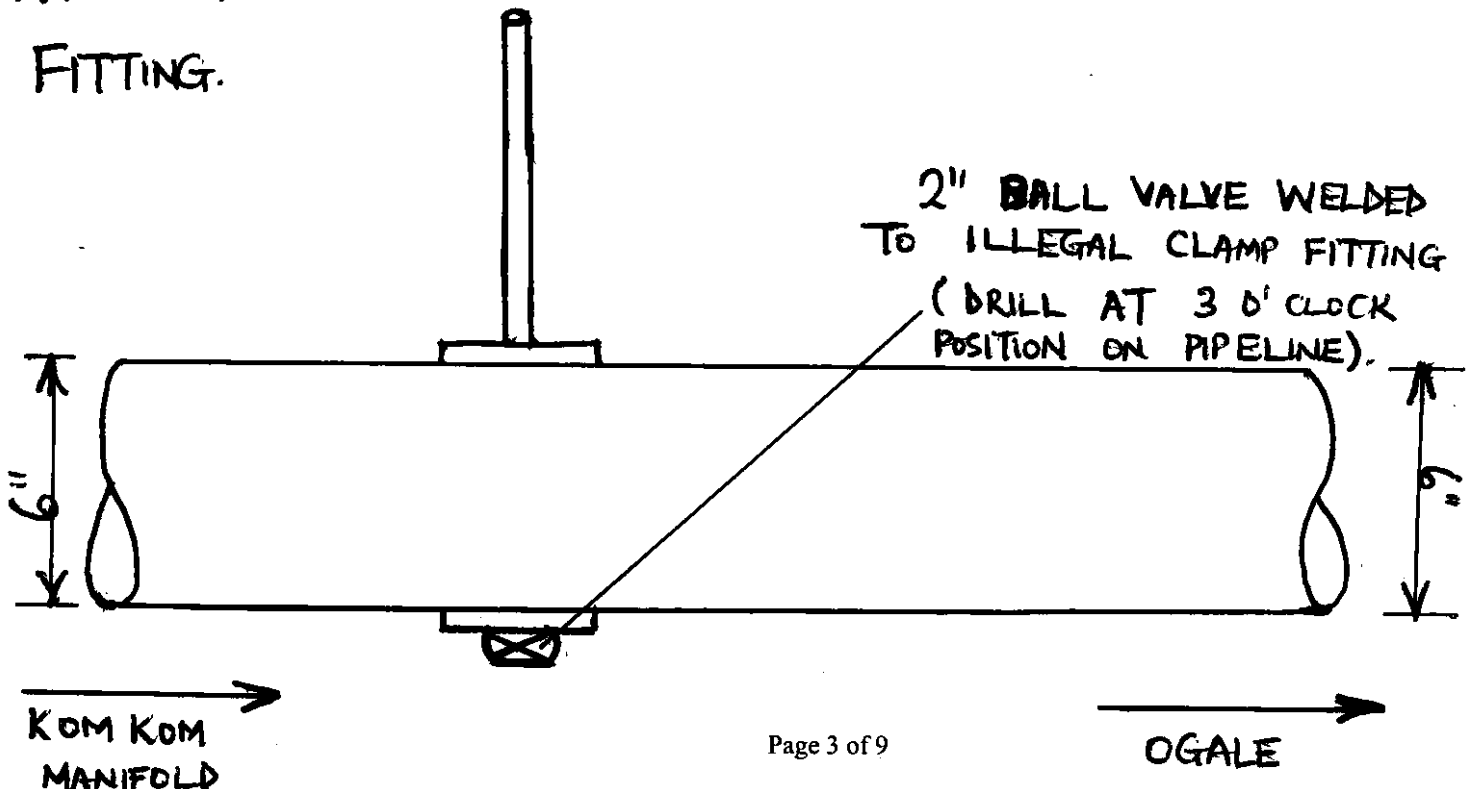
S/N	Fish/Nets/Ponds	Description	Quantity/Size	Comments
	NONE WITHIN AREA OF IMPACT			

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

S/N	Others	Description	Quantity/Size	Comments
	NONE WITHIN AREA OF IMPACT			

E. GRAPHIC DESCRIPTION OF LEAK POINT (Overview sketch of the site should be added as an appendix 1)

PLAN SECTION OF 6" OBIGBO NORTH PIPELINE AT OGALE SHOWING POSITION OF CRUDE OIL THEFT FITTING.



THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0192771945

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)

MAINTA MID BE W

S/N	Northing (m)	Easting (m)
676	90728.72	521293.39
679	90737.94	521290.32
681	90756.37	521290.36
682	90759.45	521284.20
684	90762.53	521284.21
685	90768.67	521281.14
686	90768.66	521287.30
687	90765.58	521290.38
688	90762.52	521287.29
689	90759.44	521290.37
690	90771.72	521293.47
691	90768.64	521296.55
692	90765.57	521296.54

G. INCIDENT INFORMATION:

20. Impacted Area Details

- Total calculated area of impact 0.17Ha
- Impact within SPDC R.O.W _____
- Impact outside R.O.W _____

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

Recovered oil V_{rec} :	<u>19</u>	barrels
---------------------------	-----------	---------

20. Computation of the residual volume on site

a. Computation of volume of pool of free phase oil (on land or confined water body).

- Area (m^2) occupied by pool of free phase oil 700
- Average Depth (m) of pool of free phase oil 0.014
- Emulsification factor: Nil

iv. Volume of pool of free phase oil. V_{pool} :	<u>61.64</u>	barrels
--	--------------	---------

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0192 771945

b. Computation of volume of infiltrated oil in the soil (V_{inf}).

- i. Area (m^2) covered by the oil: 1,000
- ii. Area of the pool of free phase oil in touch with soil: 700
- iii. Average Depth (m) below ground surface of infiltration of oil: 0.025
- iv. Soil type: CLAY
- v. P_e (effective porosity of the soil): 8%

iv. Volume of infiltrated oil, V_{inf}	<u>21.39</u>	barrels
--	--------------	---------

21. Computation of volume of oil on open water based on standard coloration.

- i. Total area of oil on open water: NIL
- ii. Table of average depth of oil on water based on coloration *

	Thickness (mm)	Percentage coverage	Volume (m^3)
Barely Visible	0.00004	NOT APPLICABLE	
Silvery	0.00008		
Slight Color	0.00015		
Bright Color	0.0003		
Dull	0.001		
Dark	0.002		
Black oil	0.1		
Emulsion (30% Oil)	1		
Percent Total		100%	Total Volume <u>NIL</u> bbl

iii. Volume of oil on open water, V_{wat}	<u>NIL</u>	barrels
---	------------	---------

22. Calculation of evaporated volume:

- i. Oil type: BONNY MEDIUM
- ii. E-Factor: 15%

iii. Volume of evaporated oil, V_{evap}	<u>18.01</u>	barrels
---	--------------	---------

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%

23. Gross Total Estimated Spilled Volume $V_{Est}(bbls) = V_{evap}(bbls) + V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{rec}(bbls) = 18.01 + NIL + 21.39 + 61.64 + 19 = 120.04$

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0192771945

$V_{Est}(bbls) =$	120 BARRELS.
<p>24. <u>Net Total Estimated Spilled Volume</u> $V_{Est}(bbls) = V_{evap}(bbls) + 0.6 * V_{wat}(bbls) + V_{inf}(bbls) + V_{pool}(bbls) + V_{recJ}(bbls) = 18.01 + NIL + 21.39 + 61.64 + 19 = 120.04$</p>	
$V_{Est}(bbls) =$	120 BARRELS.

*Calculation of the respective estimated volume is to be done using the new spill 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 <input type="checkbox"/>
B. Investigation of the incident site showed that there is residual impact on site requiring further works <input checked="" type="checkbox"/>

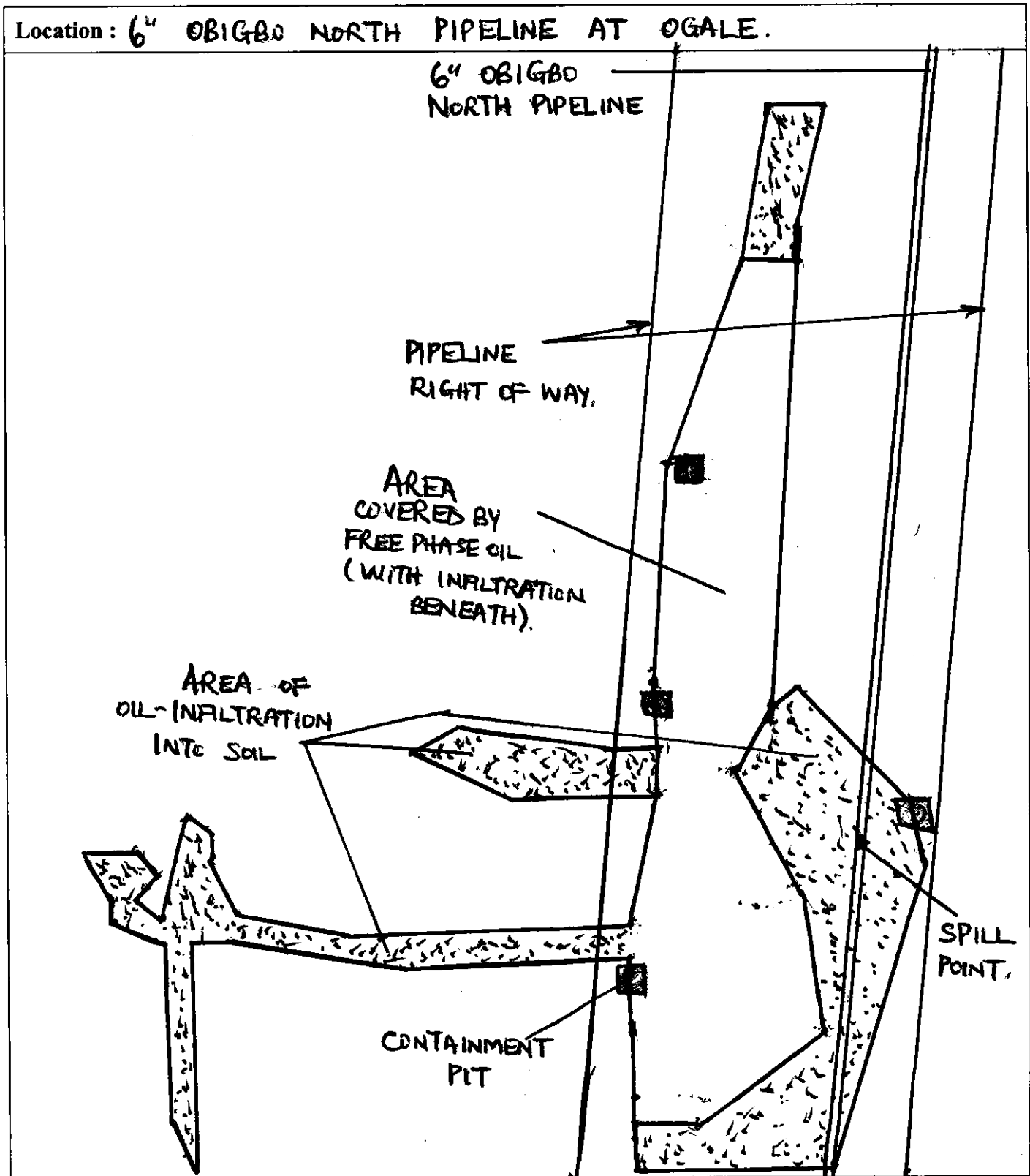
26 Signatories

<p>This report was filled and signed on the <u>03/02/2012</u> at incident site by joint investigation representatives from</p> <ul style="list-style-type: none"> • Host Community <input type="checkbox"/> • Department of Petroleum Resources [DPR]: <input checked="" type="checkbox"/> • National Oil Spill Detection and Response Agency [NOSDRA]: <input checked="" type="checkbox"/> • State Ministry of Environment [SME]: <input checked="" type="checkbox"/> • Nigeria Police Force [NPF]: <input type="checkbox"/> • Shell Petroleum Development Company [SPDC]: <input checked="" type="checkbox"/> <p style="text-align: right;"><i>Tick as applicable</i></p>	<p>DPR INCIDENT INVESTIGATION REPORT ATTACHED</p>
---	--

THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: ⁰¹⁹²771945

20. Appendix 1: Overview sketch of the site



THE SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA LIMITED

JOINT INVESTIGATION REPORT FOR INCIDENT NO: 0192771945

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

MAINTNA MID BELT

S/N	Northing (m)	Easting (m)
693	90759.42	521299.61
694	90756.32	521315.01
695	90756.25	521348.91
704	90724.68	521352.03
702	90774.71	521336.82
701	90780.88	521324.30
700	90783.94	521330.47
699	90780.83	521345.87
698	90780.82	521352.04
697	90793.11	521352.06
706	90823.82	521355.20
722	90854.53	521361.43
708	90872.95	521364.55
709	90872.94	521367.63
707	90857.59	521364.52
710	90854.52	521364.51
711	90826.74	521361.36
713	90786.95	521358.21
714	90790.62	521361.30
716	90762.37	521364.33
665	90728.59	521358.10
667	90728.61	521348.85
669	90753.18	521348.90
673	90753.24	521321.17
674	90756.35	521299.60
675	90756.36	521293.44

DEPARTMENT OF PETROLEUM RESOURCES



OIL /CHEMICAL SPILL INSPECTION REPORT

A) Company: SPDC B) Spill Incident No. 771945
1. Facility/Location: E. OBIGBO-NORTH DELIVERY LINE
OGALE

2. Date/Time Observed: 01-02-2012 3. Date of JIV: 03-02-2012

4. Known extent of pollution/Impact:
(1) SPDC RIGHT-OF-WAY
(2) THIRD PARTY FARMLANDS

5. Precautionary measures taken to prevent Hazard/ further pollution since the spillage/leakage occurred:

THE LINE HAD BEEN ISOLATED

- (a) Bundwalls
(b) Booms
(c) Sorbents
(d) Others (Specify): CONTAINMENT PITS

6. Cause of Spill:

- Drilled Hole
Explosive tear
Failed Weld
Acid Induced Corrosion
Saver Pit Overflow
Blasting
Third Party tamper with clamp
Operator/Maintenance Error
Others (Specify)
Hack Saw Cut
Inward Dent
Crude Oil Theft (Illegal Bunkering) 2" BALL VALVE INSTALLED AT 3 O'CLOCK POSITION
Natural Corrosion
Surge Vessel Overflow
Blowout
Third party tamper with: valve, Bolt, Nuts
Equipment Failure

7. Estimated Quantity Spilled (bbls):

(a) Detailed Calculations: (attach additional sheets if necessary)
120 BARRELS

8. Operational Area

- (i) OPL/OML No/UNIT DESCRIPTION
(ii) Land
(iii) Offshore (iv) Coastland (v) Swamp
(vi) Inland waters
(vii) Nearest Town: OGALE

9. Type of Spill/leak

- (i) Crude oil (ii) Product (Specify)
(iii) Drilling mud/Chemicals (iv) Others (Specify)
10. Type of Operation at Spill site: DELIVERY LINE

11. Weather Conditions:

- (a) Bright and Sunny (d) Others Specify
(b) Cloudy (e) Wind Direction
(c) Rainy (h) Wind speed
(g) Not Applicable

12. Sea Conditions

(a) Calm (b) Rough (c) Not Applicable

(Others (Specify)

(d) Direction of current: N/A

(e) Strength of current: N/A

(f) Swell height:

(g) Tidal Condition: High Low

13. Quantity of Crude Oil/Contaminant Recovered as at Time of Reporting:

2,000 LITRES (219 BBLs)

14. Any casualties: (a) Yes (b) No

If yes give details:

15. Steps taken to clean-up the spilled oil:

CRUDE OIL RECOVERY WAS ON-GOING AT THE TIME OF THIS JIV

16. Chemical/ Dispersants Used: Yes No

DPR Approved: Yes No

(a) Type:

(b) Quantity: N/A

(c) Not applicable: N/A

(d) Others (Specify):

17. Any Fire Incident: (a) Yes (b) No

If Yes, Give Details:

18. Attachments: Maps Others Pictures

19. Recommendations of the Investigation:

EFFECT REPAIRS ON THE LINE AND CLEAN-UP/REMEDiate THE IMPACTED AREAS.