Surveying of Oil Theft Activities in Wetlands Nigeria – A Case Study of Niger Delta Region.

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ABSTRACT

Key words: Surveying, Oil Theft, Wetlands, Niger Delta

Surveying, a means of finding the area of any part of the earth's surface, the lengths and directions of the boundary lines, and the shape of the surface and with accurately showing the results on paper, is a study and practice that integrates various technologies and methodologies for the acquisition, analysis, interpretation, and visualization of spatial and geographic data, which encompasses Mapping, Remote Sensing, Geographic Information Systems (GIS), and Global Navigation Satellite Systems (GNSS). This has been effective in the exploration and utilization of oil and gas reserves, development of oil fields, pre-lay, installation, commissioning and decommissioning of oil pipeline facilities, and infrastructures in wetlands Nigeria; and also, in the discovery of oil theft activities in the region.

Commercial exploitation of Nigeria oil and gas reserves began in 1956, shortly after the discovery of oil at Oloibiri in Bayelsa State. The export of the crude oil accounts for 90% of the country's foreign exchange earnings and more than 70% of its total budget expenditure. Over the years, oil that is meant to be a blessing has constituted a nuisance, leading to environmental degradation, loss of farmlands, loss of fishing grounds, communal clashes, militancy, cultism, and the total breakdown of moral values in the region.

The total neglect of the region because of poor governance and corruption provided the platform for the twin problems of oil theft for export and illegal refining. It is estimated that Nigeria losses 470,000 bpd of crude oil amounting to $700 million monthly due to oil theft, although others speculate much more than this figure.

Artisanal refining has worsened the already degraded environment by oil spills and industrial discharges. The art of the oil theft is an organized crime with local and International Oil Company (IOC) staff, government officials, security personnel, local leaders, and sundry. This menace has led to environment degradation, huge economic losses, and social vices, and if not stopped now, the impact could be more devastating.

The oil theft popularly known as illegal oil bunkering has become a regular activity in the Niger Delta region of Nigeria. Despite the huge financial cost on the part of the government and the multinational oil companies, the perpetrators of this business continue to expand their operations in the creeks leading to environmental degradation of the region.

This paper presents a review of surveying involvement in oil theft activities in terms of providing geomatics information of the locations, pipelines facilities and right of ways in the region, and guide as a tool to exposing the illegal activities such that they can be curbed to stop the activities completely.

INTRODUCTION

What is Oil Theft and Illegal Bunkering?

- Oil theft refers to the illegal taking away or stealing of crude oil or its refined products from pipelines, or storage facilities by whatever means and diverting it for personal gain, while illegal bunkering is the act of hacking into pipelines to steal crude oil which is later refined or sold abroad.
- In the context of Nigeria, oil theft is constituted as the illegal appropriation of refined oil or crude oil from the various multinational oil companies that are positioned in the country through the process of oil bunkering.

This illegal act leads to financial losses for companies, governments, and communities.

What is Oil Theft Point (OTP)?

- An illegal tapping point on the pipeline. It can also be referred to as bunkering point (BP) on the pipeline.

Surveyors in Oil Theft Point (OTP) Discovery.

- Provide geomatics information of the location and coordinates of tapped point on the pipelines.
- Conduct regular inspections, surveys, and audits of oil pipelines routes.
- Assess and monitor the infrastructure for any signs of tampering, leaks, or illegal connections, identify vulnerabilities and areas prone to theft.
- Employ technologies and techniques to maintain the integrity and security of oil related assets.

Oil Theft in Nigeria.

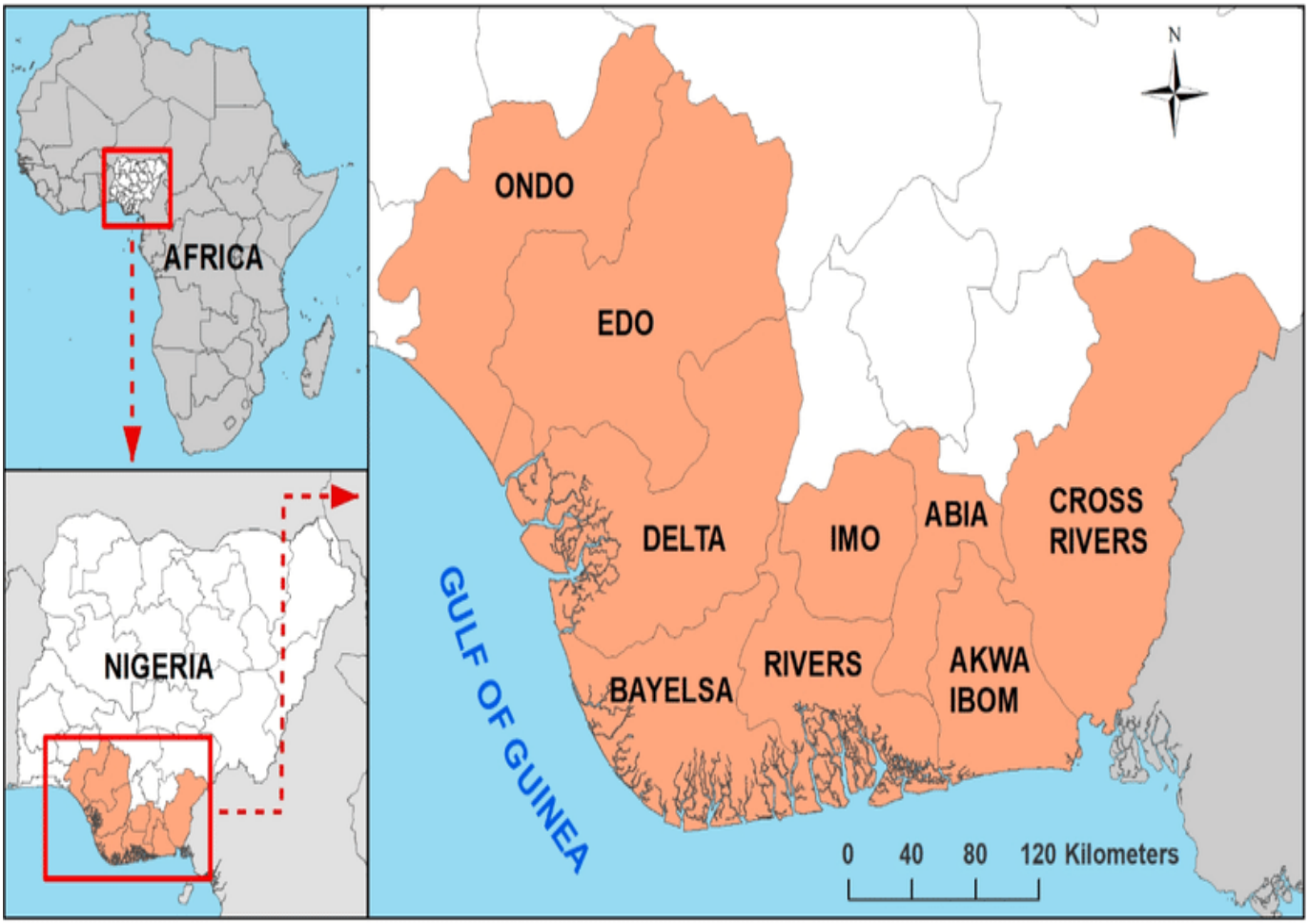
- Is considered an illegal appropriation of crude or refined oil products from the pipelines of multinational oil companies.
- Is facilitated by co-operation between security forces, militia organizations, the local population, and oil company employees.
- Is primarily cellular rather than hierarchical.
- Requires frequent collaboration between variety of random players depending on the level of oil theft being committed.
- The key players use methods such as hot-tapping and cold-tapping to perform oil bunkering and steal thousands of barrels of oil per day from established oil pipelines.
- Can also occur during the transportation of the crude oil product to the oil shipping terminals for export.

The Niger Delta Region.

- Is a densely populated region in Nigeria, known for its vast network of wetlands comprising of rivers, creeks, and mangrove swamps.
- Is an important hub for oil production in Nigeria, making it one of the world largest oil producing regions.
- Is culturally diverse, home to numerous ethnic groups with unique traditions and languages.
- Is a densely vegetated wetland.

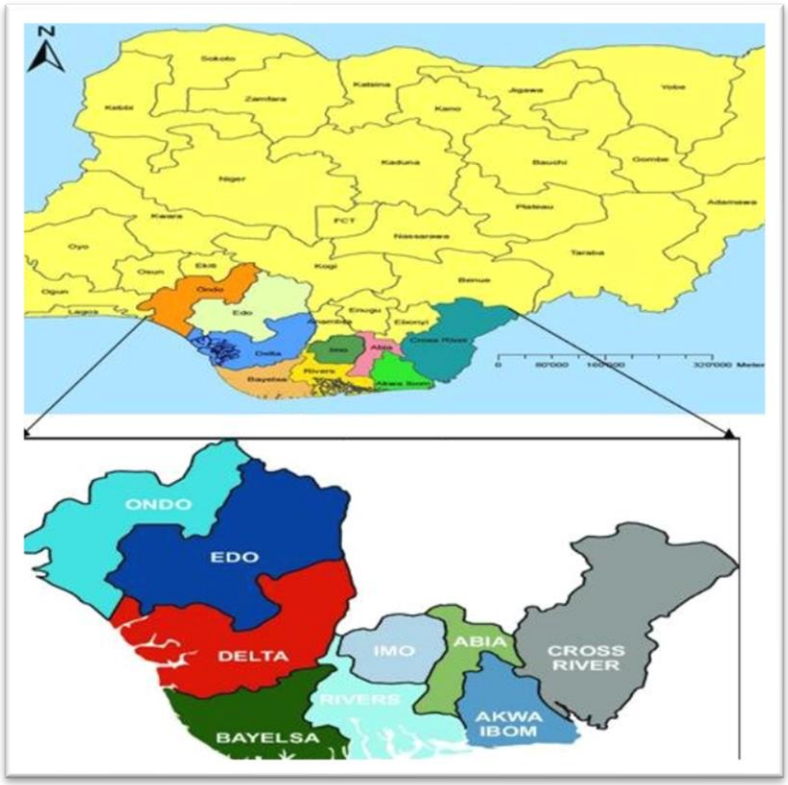
Unfortunately, the region has faced environmental degradation due to oil spills, illegal oil refining, and inadequate waste management practices, leading to ecological damage, health issues, and socio-economic challenges for the local communities, and militancy.

LOCATION AND MAP OF THE CASE STUDY REGION

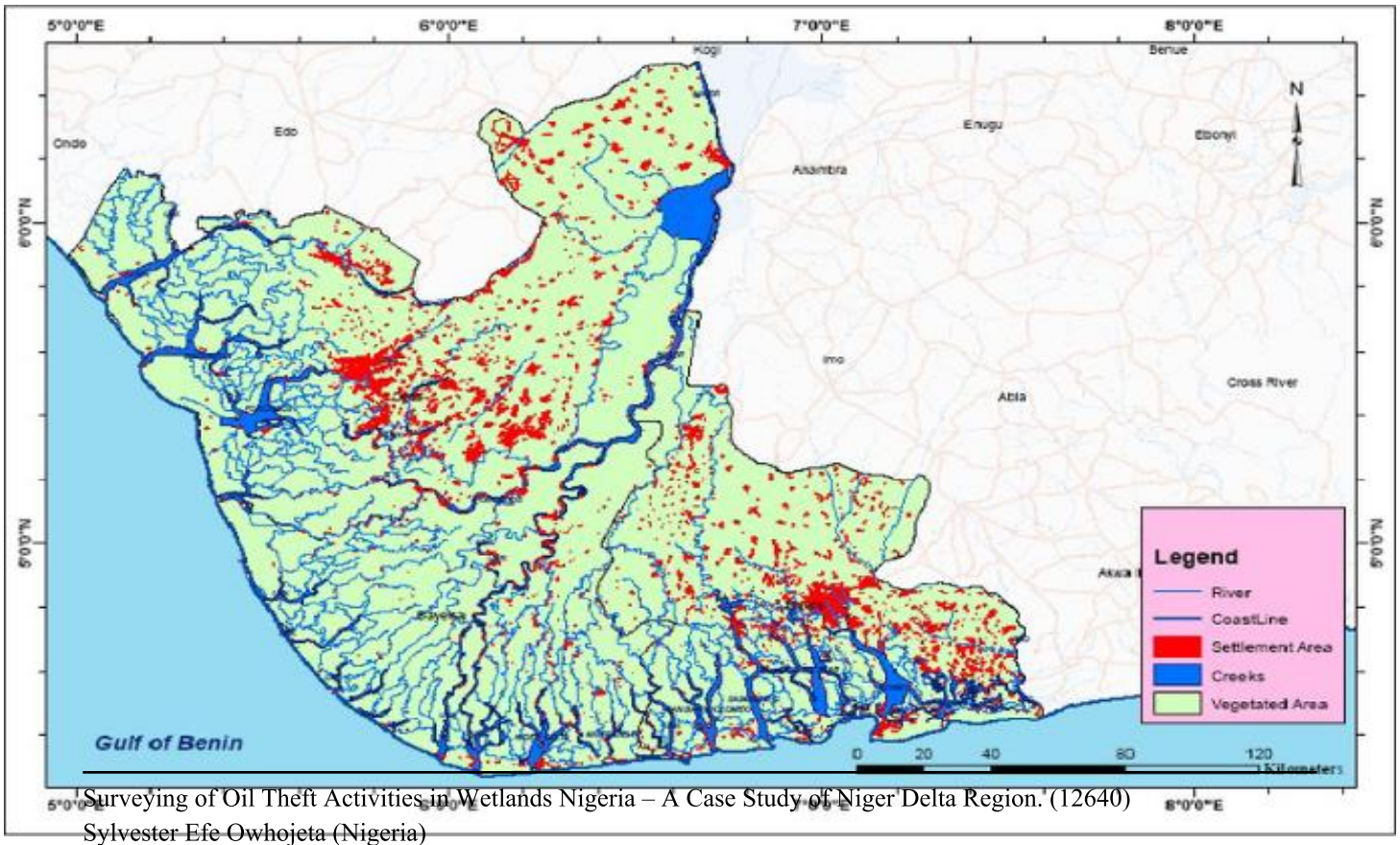


Map of Niger Delta Region in Southern Nigeria

LOCATION AND MAP OF THE CASE STUDY REGION contd…



Map of Nigeria Showing Exact Position of Niger Delta States.



Map of Niger Delta Region Showing Water Bodies and Settlements

OIL THEFT ACTIVITIES

Illegal Siphon Hoses Discovered During Pipelines ROW Surveillance

Discovered Siphon Hoses Destroyed During Pipelines ROW Surveillance

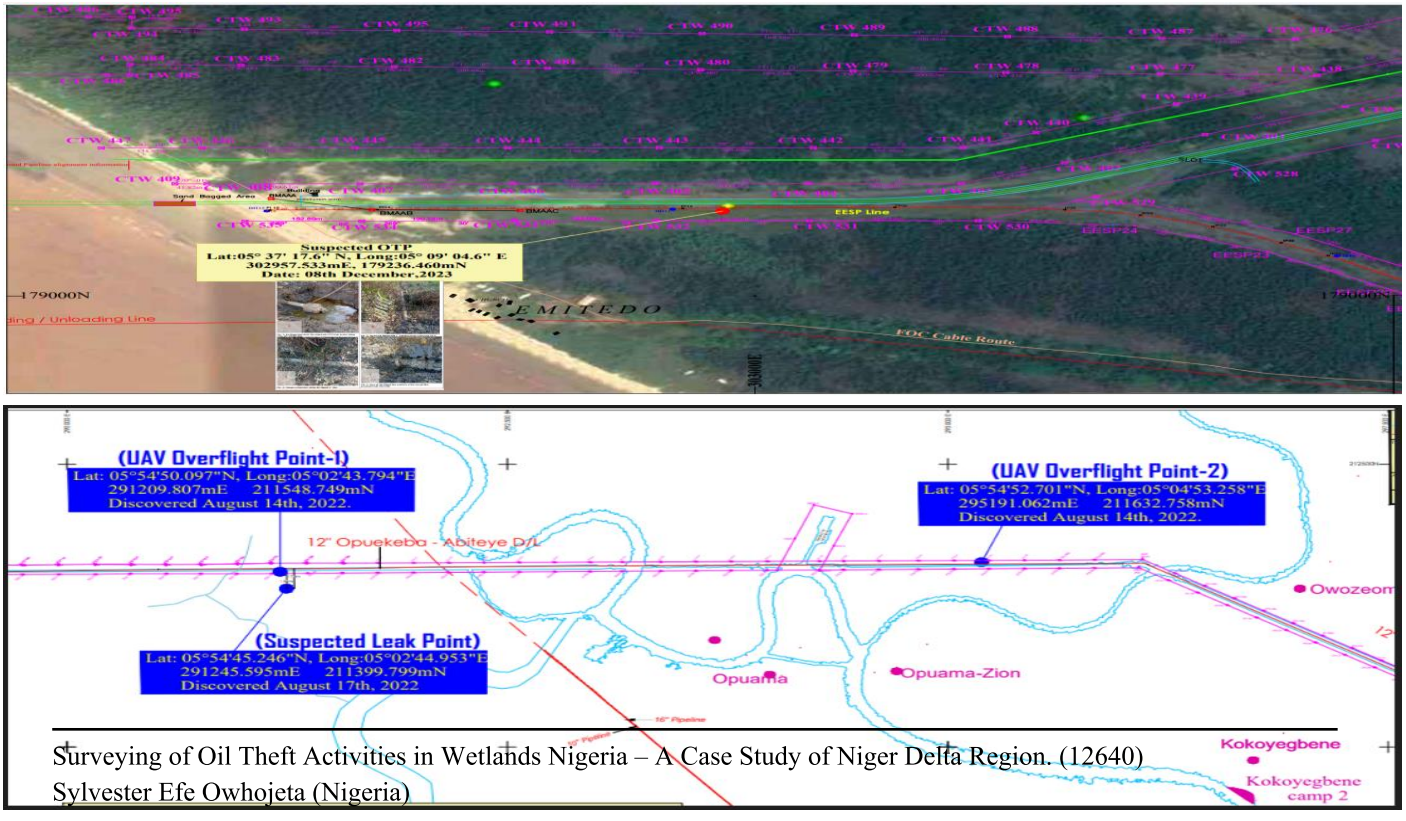
OIL THEFT ACTIVITIES contd…

Exposed OTP Cofferdam, Illegal Line and Mother Valve Along Pipeline ROW

Illegal Refinery Setup Within Pipelines ROW Locations

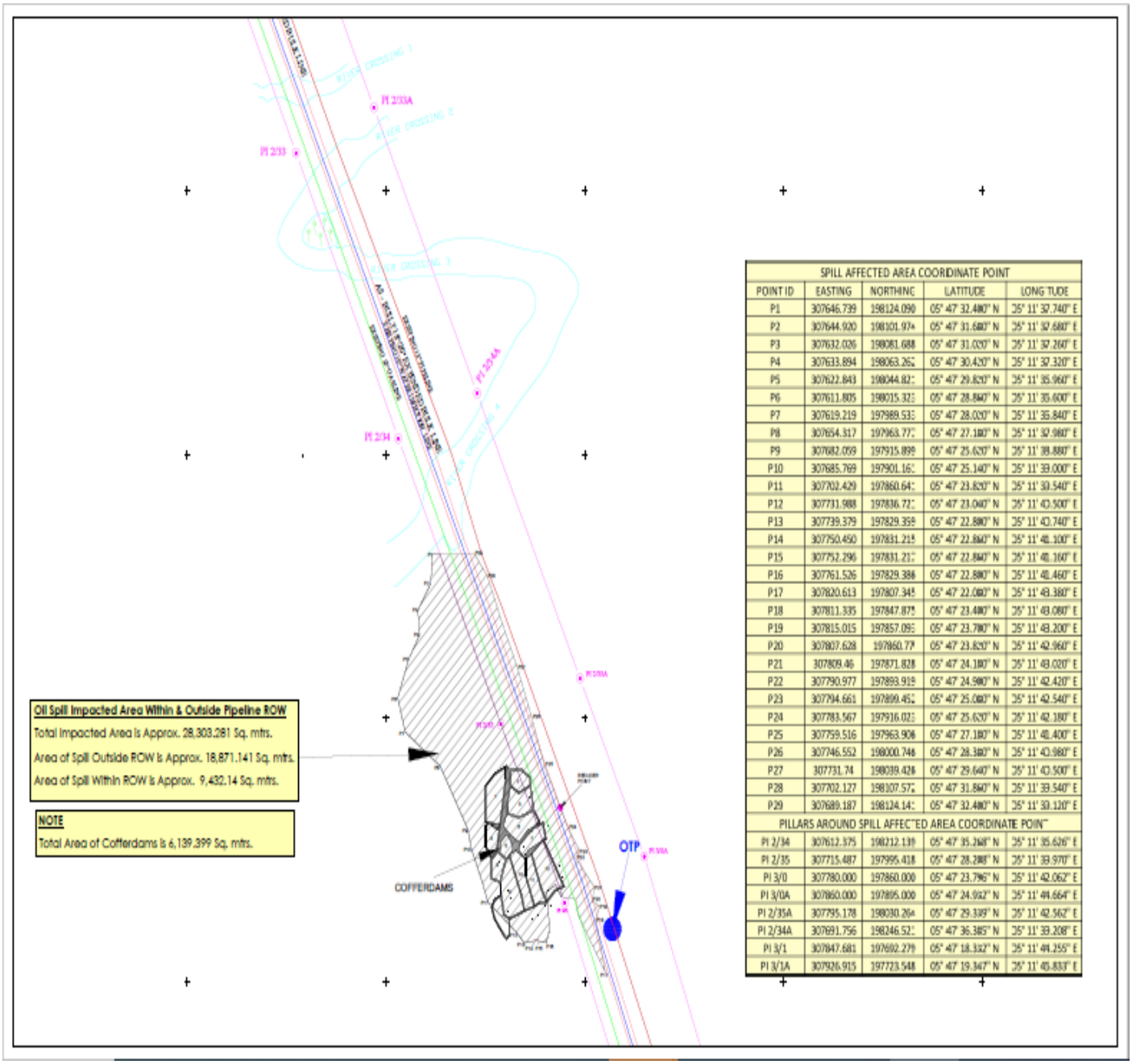
OIL THEFT ACTIVITIES contd…

Tapped Point and Illegal Line Connected to the Main Pipeline



Map Showing Suspected OTP Along Pipelines ROW

OIL SPILL IMPACT ALONG PIPELINE ROW DUE TO SUSPECTED OTP



SPILL AFFECTED AREA COORDINATE POINT				
POINT ID	EASTING	NORTHING	LATITUDE	LONG TUDE
P1	307646.739	198124.090	05° 47' 32.480" N	25° 11' 37.740" E
P2	307644.920	198101.97[illegible]	05° 47' 31.680" N	25° 11' 37.680" E
P3	307632.026	198081.688	05° 47' 31.020" N	25° 11' 37.260" E
P4	307633.894	198063.26[illegible]	05° 47' 30.420" N	25° 11' 37.320" E
P5	307622.843	198044.82[illegible]	05° 47' 29.820" N	25° 11' 35.960" E
P6	307611.805	198015.32[illegible]	05° 47' 28.840" N	25° 11' 35.600" E
P7	307619.219	197989.53[illegible]	05° 47' 28.020" N	25° 11' 35.840" E
P8	307654.317	197963.77[illegible]	05° 47' 27.180" N	25° 11' 37.980" E
P9	307682.059	197915.899	05° 47' 25.620" N	25° 11' 38.880" E
P10	307685.769	197901.16[illegible]	05° 47' 25.140" N	25° 11' 39.000" E
P11	307702.429	197860.64[illegible]	05° 47' 23.820" N	25° 11' 39.540" E
P12	307731.988	197836.72[illegible]	05° 47' 23.040" N	25° 11' 40.500" E
P13	307739.379	197829.359	05° 47' 22.800" N	25° 11' 40.740" E
P14	307750.450	197831.219	05° 47' 22.860" N	25° 11' 41.100" E
P15	307752.296	197831.21[illegible]	05° 47' 22.860" N	25° 11' 41.160" E
P16	307761.526	197829.388	05° 47' 22.800" N	25° 11' 41.460" E
P17	307820.613	197807.345	05° 47' 22.080" N	25° 11' 43.380" E
P18	307811.335	197847.875	05° 47' 23.400" N	25° 11' 43.080" E
P19	307815.015	197857.09[illegible]	05° 47' 23.700" N	25° 11' 43.200" E
P20	307807.628	197860.77[illegible]	05° 47' 23.820" N	25° 11' 42.960" E
P21	307809.46	197871.828	05° 47' 24.180" N	25° 11' 43.020" E
P22	307790.977	197893.919	05° 47' 24.900" N	25° 11' 42.420" E
P23	307794.661	197899.45[illegible]	05° 47' 25.080" N	25° 11' 42.540" E
P24	307783.567	197916.02[illegible]	05° 47' 25.620" N	25° 11' 42.180" E
P25	307759.516	197963.908	05° 47' 27.180" N	25° 11' 41.400" E
P26	307746.552	198000.748	05° 47' 28.380" N	25° 11' 40.980" E
P27	307731.74	198039.428	05° 47' 29.640" N	25° 11' 40.500" E
P28	307702.127	198107.57[illegible]	05° 47' 31.860" N	25° 11' 39.540" E
P29	307689.187	198124.14[illegible]	05° 47' 32.480" N	25° 11' 39.120" E
PILLARS AROUND SPILL AFFEC"ED AREA COORDINATE POIN"				
PI 2/34	307612.375	198212.139	05° 47' 35.268" N	25° 11' 35.626" E
PI 2/35	307715.487	197995.418	05° 47' 28.288" N	25° 11' 39.970" E
PI 3/0	307780.000	197860.000	05° 47' 23.796" N	25° 11' 42.062" E
PI 3/0A	307860.000	197895.000	05° 47' 24.932" N	25° 11' 49.664" E
PI 2/35A	307795.178	198030.26[illegible]	05° 47' 29.339" N	25° 11' 42.562" E
PI 2/34A	307691.756	198246.52[illegible]	05° 47' 36.385" N	25° 11' 39.208" E
PI 3/1	307847.681	197692.279	05° 47' 18.332" N	25° 11' 49.255" E
PI 3/1A	307926.915	197723.548	05° 47' 19.347" N	25° 11' 49.833" E

SURVEYING OF OIL THEFT ACTIVITIES

It is important to clarify that the surveying profession itself is not inherently involved in or supportive of illegal activities, including oil theft. Surveyors are trained professionals who typically adhere to ethical standards and legal guidelines. Their work is primarily focused on tasks such as mapping, measuring, and assessing land for legitimate purposes. However, surveying techniques and technologies can be used by law enforcement or security agencies to monitor and combat illegal activities, including oil theft.

Some ways in which surveying can be applied to address oil theft are specified below:

Aerial Surveys:

- Aerial surveys using drones or aircraft equipped with specialized sensors can be employed to monitor large areas, including oil facilities and pipeline routes. This helps in identifying any unusual activities, unauthorized connections, or signs of tampering.

GIS and Spatial Analysis:

- Geographic Information Systems (GIS) can be used to analyze spatial data related to oil infrastructure. This includes creating maps that highlight vulnerable areas, assessing the terrain for potential illegal routes, and identifying areas prone to theft.

Remote Sensing:

- Satellite imagery and other remote sensing technologies can be utilized to monitor changes in the landscape, identify oil spills, and detect any suspicious activities around oil facilities.

Monitoring Pipeline Integrity:

- Surveying methods, such as ground-based measurements and inspections, are used to monitor the integrity of pipelines. This helps in identifying potential leaks or points of weakness that could be exploited for theft.

Utilization of Geospatial Technologies:

- A sure means of checking oil theft and destruction of oil facilities. Surveying and geoinformatics deal with activities on the earth surface, positioning, and movement of objects.

THE ROLE OF SURVEYING IN OIL THEFT ACTIVITIES

Surveying, as a legitimate and ethical profession, plays a crucial role in various industries, including the oil and gas sector. In the context of oil theft, Surveyors are responsible for tasks such as:

- **Mapping and Reconnaissance:**
  - ✓ create detailed maps and surveys of oil facilities, pipelines, and other infrastructure.

- **Identifying Vulnerabilities:**
  - ✓ identifying vulnerabilities in the oil infrastructure, such as weak points in pipelines or areas where security is lacking.

- **Mapping Illegal Pipelines or Routes:**
  - ✓ map and identify unauthorized pipelines or routes used by criminals for oil theft.

- **Identifying Weaknesses in Security Measures:**
  - ✓ assessing and identifying weaknesses in the security measures of oil facilities, pipelines, or storage areas, contributing to illegal activities.

- **Mapping and Surveying for Illegal Routes:**
  - ✓ identify potential illegal routes for the transportation of stolen oil. This could involve creating detailed maps that highlight vulnerable or less-patrolled areas.

- **GIS for Planning Illegal Activities:**
  - ✓ Geographic Information Systems (GIS) can be used to analyze spatial data and plan activities. GIS could be misused to plan routes for theft, identify weak points in security, or analyze data to avoid detection.

CONCLUSION

This paper presentation has revealed.

- It is crucial to differentiate between the legitimate use of surveying for monitoring and preventing illegal activities and any misuse of surveying skills for criminal purposes.

- It is important to note that any involvement of surveying practice in illegal activities is unethical and illegal.

- It is also important to reiterate that any involvement of surveyors in illegal oil theft activities is contrary to professional ethics and legal standards.

Legitimate surveying work is meant to contribute to legal and responsible spatial data management, urban planning, environmental monitoring, and various other applications. The legitimate surveying professionals are to contribute to responsible infrastructure development and environmental monitoring processes, and they are not or should not be involved in supporting illegal activities, such as oil theft.

If there are suspicions or concerns about the misuse of surveying information in illegal activities or you suspect oil theft activities along pipeline right of ways and any oil field facilities, it is important to report such activities to the appropriate/relevant authorities and law enforcement agencies.

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BIOGRAPHICAL NOTES

OWHOJETA Sylvester Efe, is a Registered Surveyor with the Surveyors Council of Nigeria (SURCON), a Member of the Nigerian Institution of Surveyors (NIS) and Fellow of the Institute of Management Consultants (IMC). An author of the book Early Production System (EPS) Barge Movement – Installation at Olero Creek Production Platform, Benin River Area (by Lambert Academic Publishing). Graduated with a B.Sc. (Hons) degree in Surveying, Geodesy and Photogrammetry from the University of Nigeria, Nsukka, Nigeria and obtained a master's degree in petroleum economics from Ambrose Alli University, Ekpoma, Nigeria. He has been on contract engagement with the oil and gas sector since July 2005, working extensively in the Niger Delta region of Nigeria. He has presented different technical papers at the FIG Working Weeks 2008, 2009, 2011, and 2017 in Stockholm-Sweden, Eilat-Israel, Marrakech-Morocco, and Helsinki-Finland respectively.

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