ENUGU STATE SOLID MINERAL RESOURCES AND MINING

COAL DEPOSITS

INYI BLOCK

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EXECUTIVE SUMMARY

The global techniques of mineral resources estimation was adopted on the coal deposits in NCC Inyi Coal Block. This technique is the multiplication of total prospective area of Concession by actual thickness of the deposits. The product is multiplied by specific gravity of coal.

The Inyi Coal Concession is located along Oji River – Inyi road, in Inyi area, Oji River Local Government Area, Enugu State. The concession covers 126 cadastral units and about 25.2 square kilometres. Inyi block is about 50km southwest of Enugu metropolis. It lies within latitudes 6° 06' 00"N - 6° 09' 30"N and longitudes 7° 15' 30" E - 7° 17' 45"E. The estimated coal reserve is about 50 million metric tonnes and a proven reserve of about 20 million metric tonnes. The estimate is based on total area, drilled boreholes and field measurements.

However, investigated prospective area is about 5,739,788.03 sq metres and the average thickness of the coal from core drilling is about 3m. Coal has a specific gravity of 1.33. Thus, the proven reserve of Inyi coal block is about **22, 901,754.24** metric tonnes. The parameters used in estimation are based on previous drilled boreholes and field measurements from the Geological Survey of Nigeria (GSN) and the prospect area. This assessment will be used to evaluate the coal block. Bureau of Public Enterprises will ensure that cost of investment, taxes, compensations, and all other necessary charges are considered in the bid value of the block, to ensure that a successful bidder gets a good return on investment.

Preamble

Coal mining in Nigeria started at Obwetti in 1916 with an initial production of 24,500 tonnes. With the expansion of the railway line from Enugu to Port-Harcourt by 1929 coal production had increased to 350,000 tonnes. The world economic crisis in the 1930's caused a slight decline in production; however, production rapidly rose to 668,000 tonnes in the World War 2 years of 1944/45. This led to establishment of the Nigerian Coal oration (NCC) in 1950 under the Coal Ordinance No. 29 NCC was given the exclusive rights to mine coal in Nigeria and production continued to increase to almost one million tones by 1958/59. Thereafter it declined and the mines were closed down during the civil war years (1966-1970). The Okpara and Onyeama mines were dewatered after the civil war and production crept back to over 257,000 tonnes by 1975.

The performance of the NCC continued to decline and production suffered a ridiculous decline to near total collapse when 2,712 tonnes of coal was produced in 2001 and the industry has remained in comatose since then. Reasons adduced for the decline in production include

- The stoppage of coal supplies to the Nigerian Railway Corporation due to the dieselization of its operation;
- Decreased demand from the then National Electric Power Authority (NEPA) as a result of the introduction of hydrothermal and gas plants in electricity generation;
- Eventual closure of the Oji River Coal fired plants as a result of the civil war;

- Reduced supplies of coal to the Nigerian Cement Company (NIGERCEM) as a result of continuous production problems and eventual cessation of production at the cement plant;
- Over-riding prominence of petroleum products in energy mix of the nation and the attendant neglect of the solid minerals industry;
- Absence of clear-cut government policy on energy use that would have guaranteed a share for coal in the energy mix of the country; and
- Management problems at the Nigerian Coal Corporation

Nigeria's Third National Development Plan (1975 – 1980) saw the Federal government attempting to revamp the NCC and the coal industry with the decision to mechanize the Enugu mines (Okpara & Onyeama mines). A contract was awarded to provide and install mechanized production equipment and also erect a coal washing plant. Though completed and commissioned in 1978 the contract achieved only 23.5% success as it failed due to faulty planning and monitoring.

Following a diagnostic study conducted by the then Technical Committee on Privatization and Commercialization of the Nigerian Coal Corporation which included;

a. Pre-investment studies/exploration
b. Mine development for coal production
c. Rehabilitation of mine infrastructure (aerial ropeway, turn-around maintenance of the coal preparation unit, establishment of drainage system at Okpara and Okaba Mines)

d. Coal utilization and production development.
e. Development of Peat-wood Plantation.

In furtherance to the above, the Federal Government, between 1995 and 2003, released a total of N1,929 Billion as capital allocations to the Nigerian Coal Corporation for the above projects.

However, these releases were grossly inadequate to fund the Capital – intensive projects of turning around the fortunes of the industry. Again the impact of government's efforts was not realized. It was within this emerging framework that the Federal government in 1999 deregulated the sector in its quest to attract private sector investment as well as facilitating joint venture partnerships between the NCC and private companies. Available data shows that coal has occurrence in more than 22 coalfields spread over 13 States of the Federation. The proven coal reserves so far in Nigeria total about 639 million metric tonnes while the inferred reserves sum up to 2.75 billion metric tonnes.

(B) Prior to the ongoing reform programme in the Solid Minerals Sector, when the Federal Government of Nigeria, through the Bureau of Public Enterprises divests from all its ownership interests, previously held through the Nigeria Coal Corporation (NCC) and other state-owned entities under the ministry, in the solid mineral sector, the Federal Government in 1999, and established a policy and legislation the de-regulated mineral exploration and exploitation. The intention is for the MMSD to focus solely on her new role as **administrator-regulator,** while the private sector will act as **owner-operator.**

The restructuring entails:

(a) Concession of the core assets (coal blocks) hitherto held by NCC to private investors;
(b) Sale of non-core assets through competitive bidding process; and
(c) Winding down of the corporation by the Ministry of Mines and steel Development.

In this current phase, the federal Government, through the Bureau of Public Enterprises, advertised for concession, five (5) NCC coal blocks (Amansiodo block, Inyi block, Ogwashi-Azagba block, Okpara block aand Onyeama block) to prospective investors between 4th of April 2023 to 15th of May 2023. At the end of prequalification exercise, only nine (9) companies were successful with twenty three (23) bids.

A credible and accurate assessment of the coal blocks has been carried out using the previous data generated by NCC and other government stakeholders like NGSA. The estimate will be used to evaluate the coal block. Bureau of Public Enterprises will ensure that cost of investment, taxes, compensations, and all other necessary charges are considered in the bid value of the block, to ensure that a successful bidder gets a good return on investment.

1.0 **INTRODUCTION**

A mineral proven reserve is the economically mineable part of a measured mineral resource, after all application of all mining

factors. It is the basis of an economically viable project after taking account of all relevant processing, metallurgical, mining, economic, marketing, legal, environment, government factors, etc.

1.1 INYI COAL BLOCK

1.11 Coal Block Description and Location

The Inyi Coal block covers 126 cadastral units and about 25.2 square kilometres. The Concession is about 50km southwest of Enugu metropolis and a few kilometres from Oji River. It lies within latitudes 6° 06’ 00”N - 6° 09' 30”N and longitudes 7° 15’ 30” E - 7° 17’ 45”E. The estimated coal reserve is about 50 million metric tonnes and a proven reserve of about **22 million** metric tonnes. The estimate is based on prospective area, drilled boreholes and field measurements.

The boundary coordinates are listed in Table 1 below.

Table 1: Coordinates of Inyi Coal Block

S/N	LONGITUDE	LATITUDE
1	007^0 17’ 45”	06^0 09’ 30”
2	007^0 17’ 45”	06^0 06’ 00”

3	007⁰ 15’ 30”	06⁰ 06’ 00”
4	007⁰ 15’ 30”	06⁰ 09’ 30”

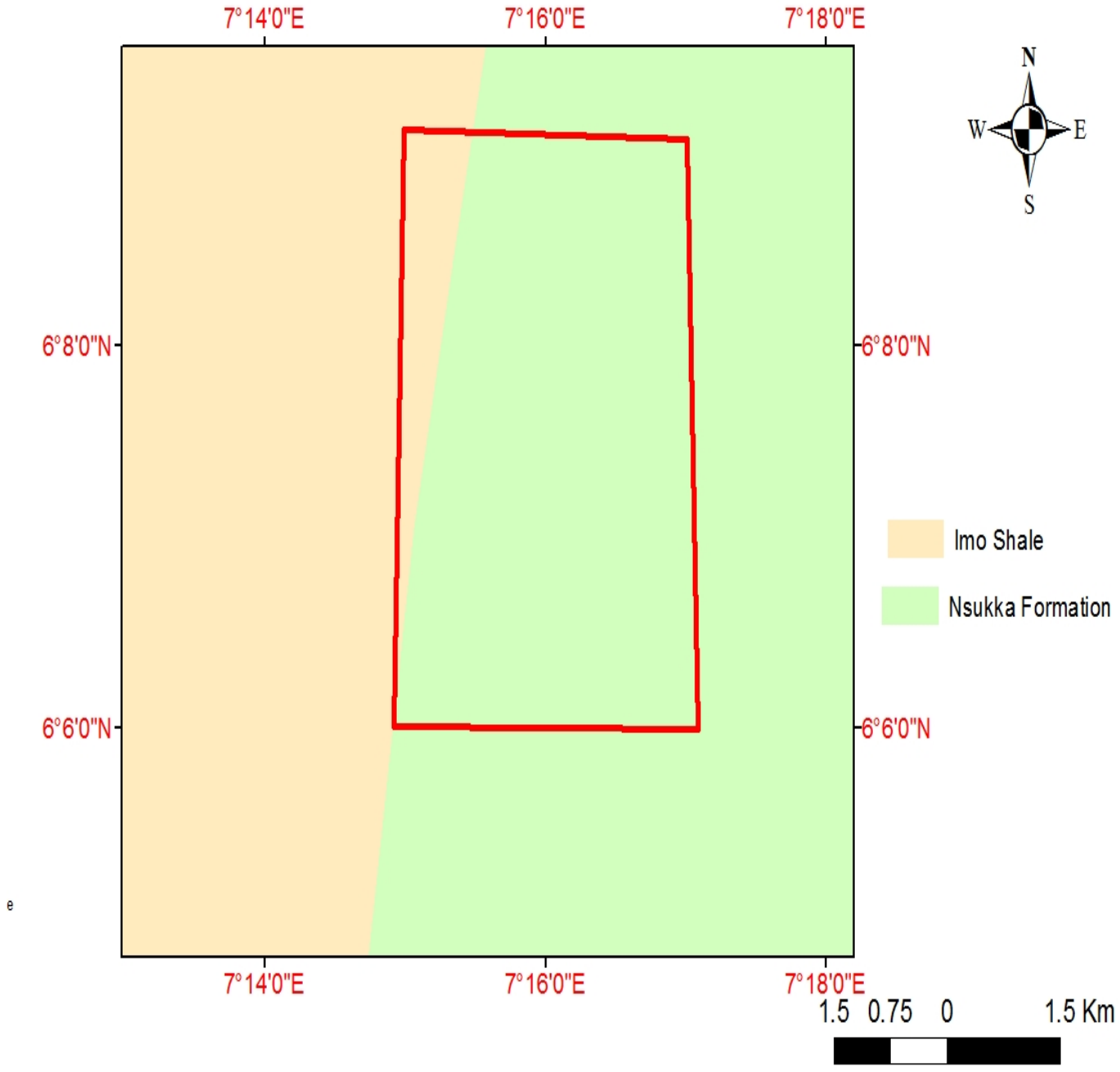

Figure 1: Geological map of Inyi coal block

2.0 COAL RESOURCE ESTIMATION

2.1 RESOURCE ESTIMATION OF COAL DEPOSITS AT INYI COAL BLOCK

Geological Survey of Nigeria has properly investigated the Inyi Coal block and from the data/information available to the BPE, total area of the Concession as well as 3D models (Figures 2 - 4) was systematically and digitally produced. The volume also was accurately calculated from the digital models by considering the varying thickness of coal across the Lease.

The estimated coal reserve was previously about 50 million metric tonnes and a proven reserve of 20 million metric tonnes. The estimate is based on total area, drilled boreholes and field measurements.

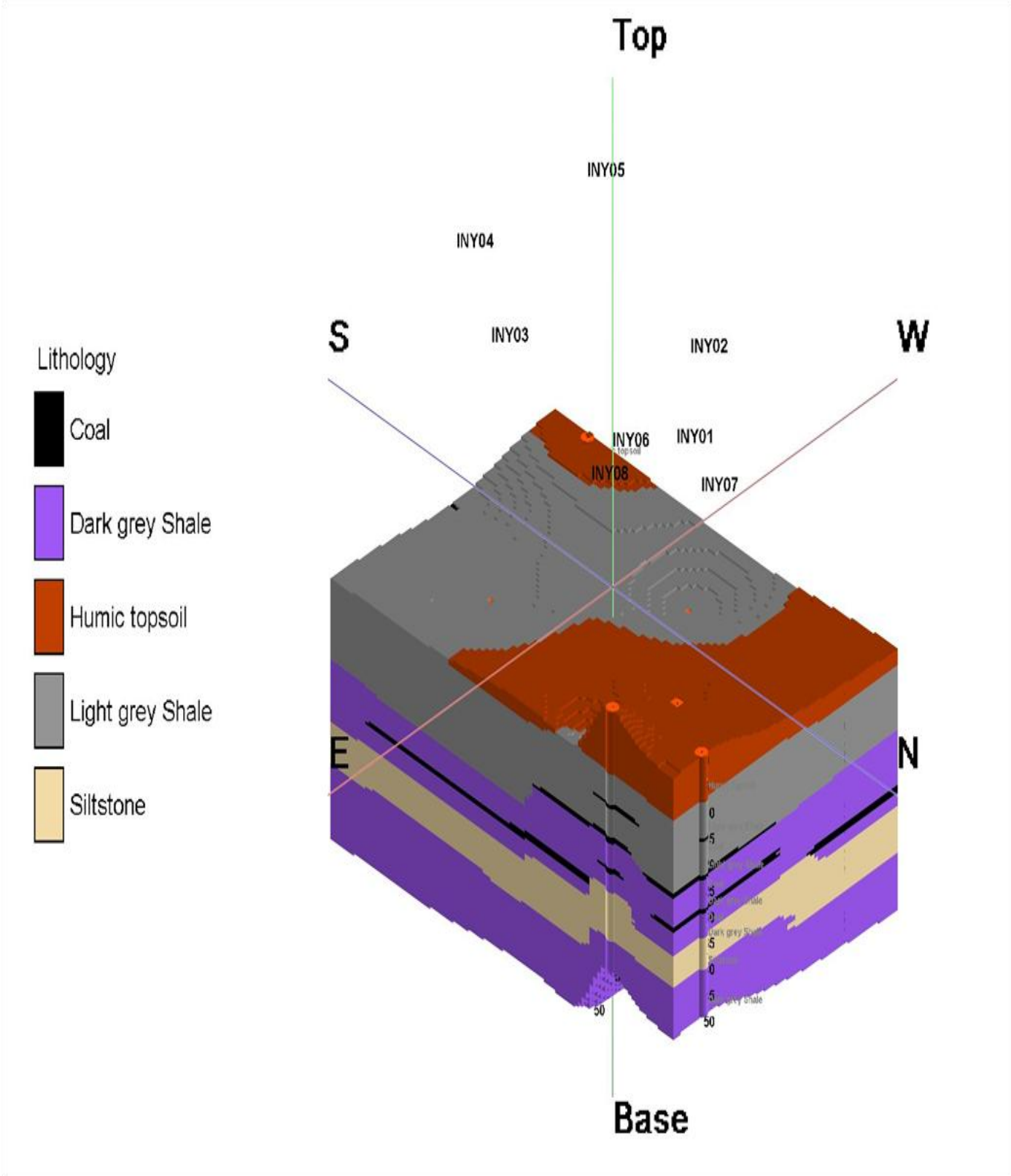

Figure 2: 3D litholog model of Inyi block

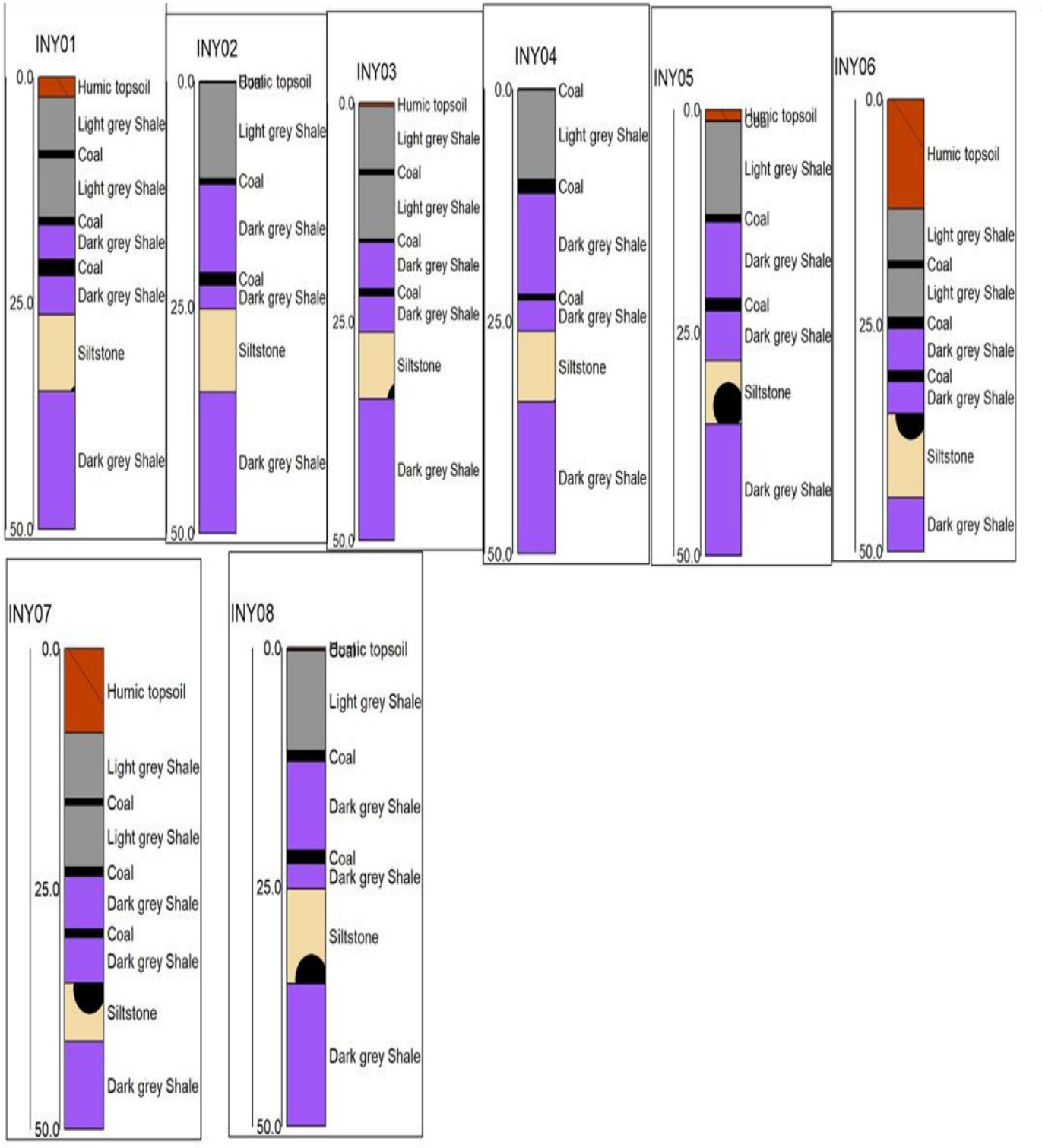

Figure 3: Multiple 3D log model of Inyi block

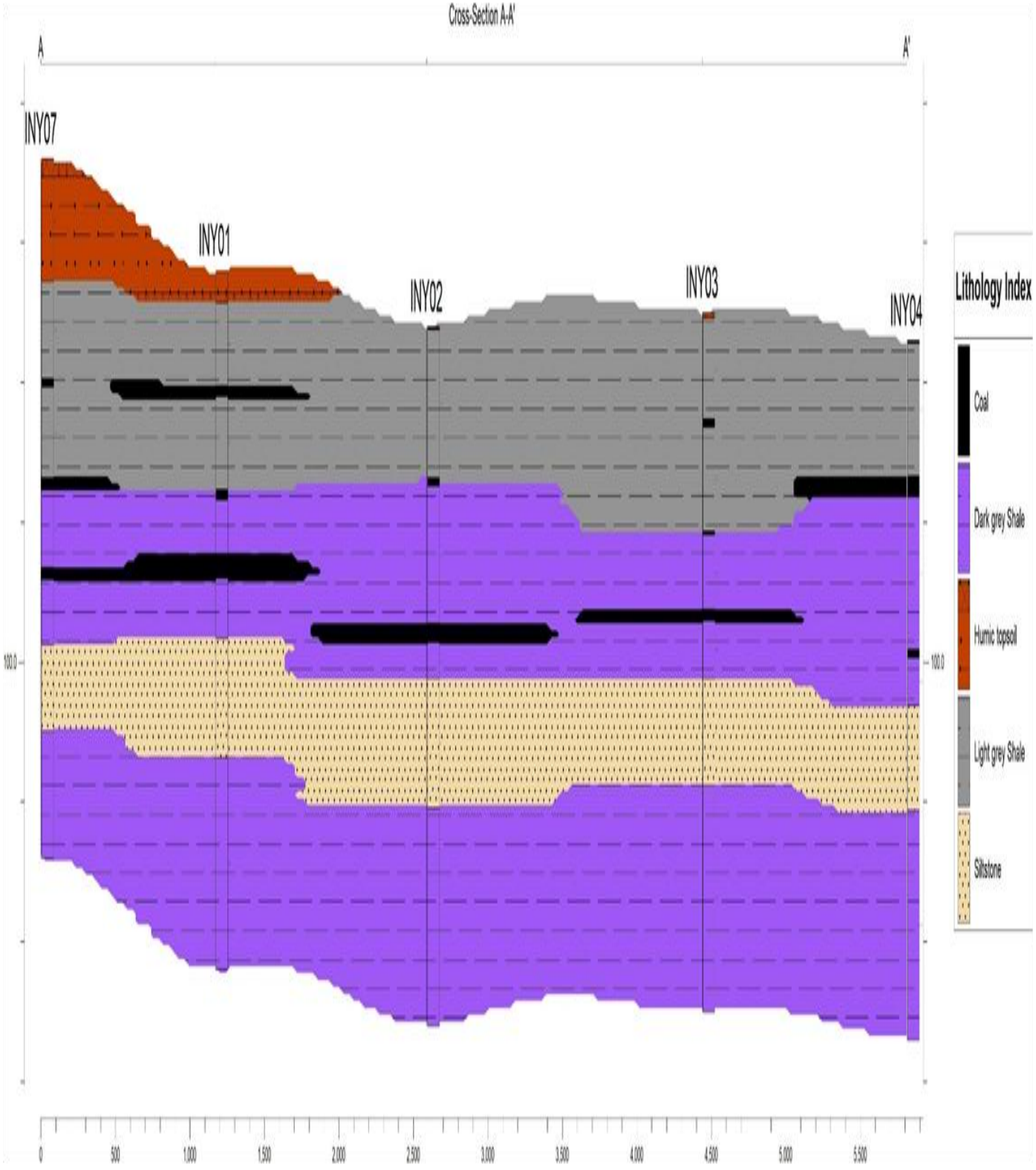

Figure 4: Cross section of Inyi block

2.2 ESTIMATION OF COAL MINERAL RESOURCE OF INYI BLOCK

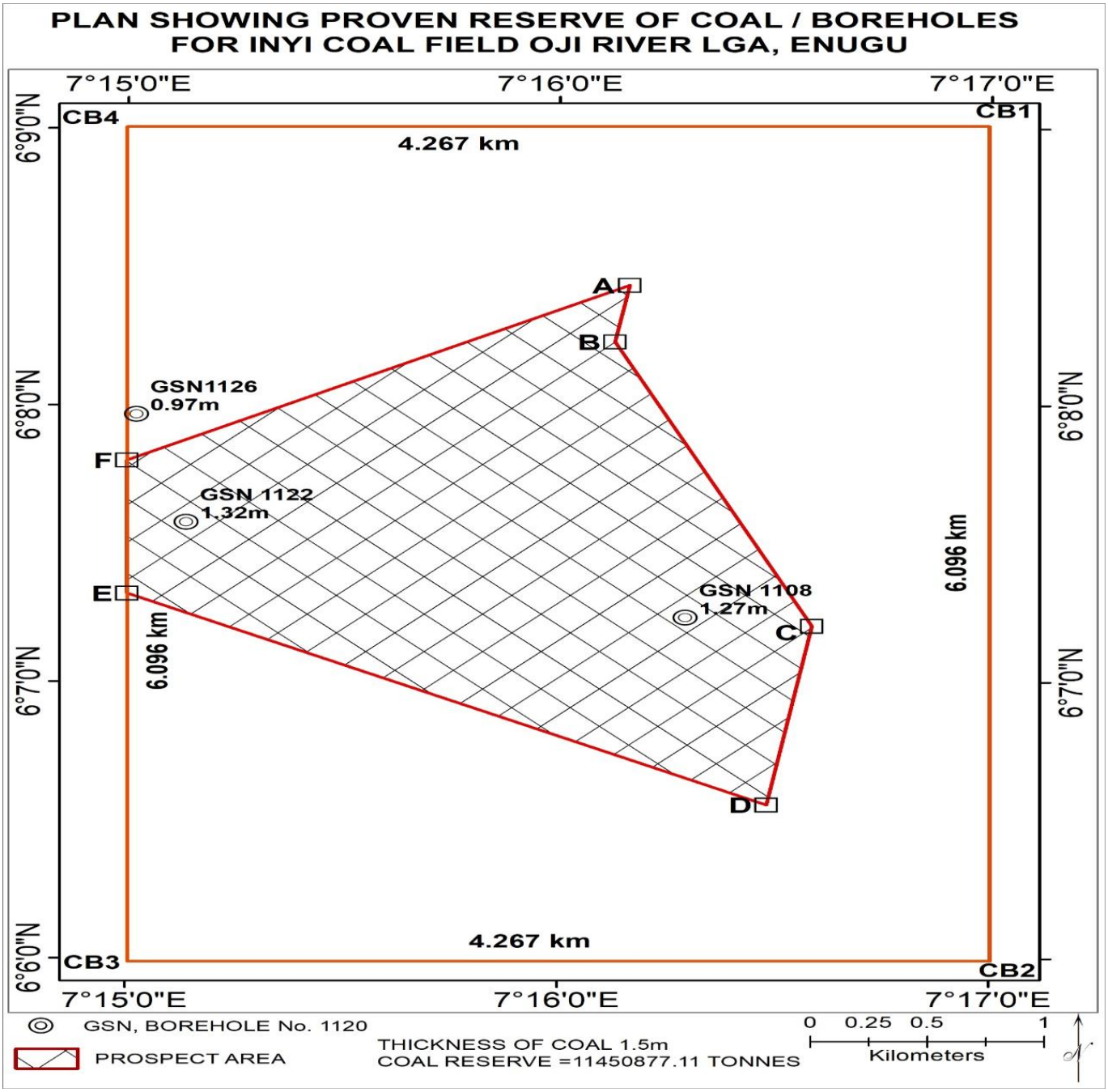

Figure 5: Plan showing reserve of Inyi coal block

INYI COAL FIELD PROVEN RESERVE				
Name	**AREA (m^2)**	**PERIMETER**	**COAL_VOL**	**TONNAGE**
PROSPECT AREA	5,739,788.03	10,070.44	8,609,682.04	11,450,877.11

AVERAGE COAL THICKNESS = 1.5m

SPECIFIC GRAVITY (S.G) = 1.33

PROVEN RESERVE = 11450877.11 TONNES

Resource estimation is given as;

The product of the Volume of mineral resource and specific gravity. It is expressed in metric tonnes.

The volume of the mineral resource ==== area in sq metres times thickness in metres.

Thus, eventual coal mineral resource estimate can be estimated as;

Resource estimate = total volume of coal X specific gravity of coal.

Total volume of coal as shown in table 2 above is 8, 609, 682.04m^3

Specific gravity of coal is 1.33

Thus; = 8, 609, 682.04m^3 *X sp. gravity (1.33)*

= 11, 450, 877.11 metric tonnes.

Thus, coal deposit within the Inyi Coal Block is proven at 11, 450, 877.11 metric tonnes

3.0 CONCLUSION AND RECOMMENDATION

The Inyi Coal Concession covers 126 cadastral units and about 25.2 square kilometres. The block is about 50km southwest of Enugu metropolis and a few kilometres from Oji River. It lies within latitudes 6° 06’ 00”N - 6° 09' 30”N and longitudes 7° 15’ 30” E - 7° 17’ 45”E. The estimated coal reserve is about 50 million metric tonnes and a proven reserve previously put at 20 million metric tonnes. The estimate is based on total area, drilled boreholes and field measurements.

However, investigated prospective area is about 5,739,788.03 sq metres and the average thickness of the coal from core drilling is about 3m. Coal has a specific gravity of 1.33. Thus, the proven reserve of Inyi coal block is about **22, 901,754.24** metric tonnes. The parameters used in estimation are based on previous drilled boreholes and field measurements from GSN and the prospective area.

Further assessment of the coal within the block is recommended via more core drilling expedition.