

## **QUANTITATIVE ASSESSMENT OF LEAD–ZINC DEPOSIT THROUGH CORE – DRILLING AT IGIDAGU OKPITUMO AMACHI, ABAKALIKI LOCAL GOVERNMENT AREA OF EBONYI STATE**

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### **Abstract**

The core drilling activities was a follow up of geological and geophysical exploration of the Exploration Lease (EL) over an area of land at above address acquired by Forward Gems and Earth Ltd, for quantitative assessment of the deposits of lead/zinc for economic viability. The core drilling exercise was used as a comparative studies and confirmative assessment of detailed reconnaissance survey, detailed geological and geophysical exploration already carried out on the acquired land. It is the third phase of the project. The samples analysis of the cores obtained was used to determine and reveal the physical and chemical nature of the rock underneath. The VES points where the core drill was carried out was chosen based on recommendation of geophysical/geological survey. However the survey report suggested that the lead mineralization faults/anomaly occurred in a deeper formation.

**Key words:** Core drill, exploration, geology, samples and economic viability.

### **Introduction**

This study reveals that there is a lode in the investigation area trending NE – SW and occasionally E – W, the lode varies in size and trend. The magnetic anomaly signature, IP results and imaging agrees on it. Vertical electrical sounding, Schlumberger array determined the varying in overburden thickness between 40m – 60m across the area. These techniques have been helpful in discovering and/or delineating lead - zinc deposits but it is suggested that shafting, trenching and coring be used as a comparative studies and confirmative assessment. The core drill major aim is to further collaborate and confirm the results of geophysical surveys. Several ore bodies or deposits can have a similar signature, hence the core drilling activity will help to ascertain the information..

The VES points where the core drill was carried out was chosen based on recommendation of geophysical/geological survey.

However the survey report suggested the lead mineralization faults/anomaly occurred in a deeper formation. The subsequent core drill was guided by the results of resistivity pseudo section and the 2-D resistivity structures from mineral exploration carried out. The 2-D resistivity structure show variations in layer resistivity across the measured field.

### **Aim and Objective of the Core Drill**

The primary aim is to use core drill to complement the IP surveys, resistivity sounding and profiling as well as assessment of magnetic anomalies conducted through qualitative and quantitative analysis of aeromagnetic data acquired.

The core drill is to borehole in designated VES points that exhibits mineralization signatures during the survey.






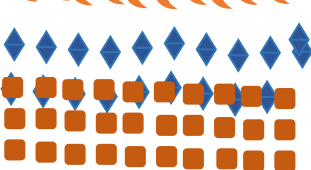




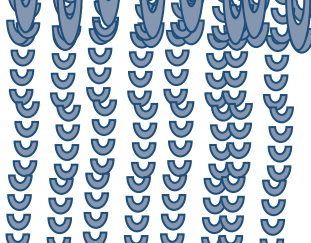
The obtained Core samples which are small picturing of a geological formation taken from the cutting carried out from a well was used for geologic analyses. The samples analysis is to determine and reveal the physical and chemical nature of the rock underneath.


### Location and Accessibility

The core drill took place within the lease area that lies on latitude VES 2, and 3 respectively (060 16' 44.5''N, 0080 16' 50.5''E, and 060 16' 23.1''N, 0080 16' 23.8''E). It is located in IGIDAGU OKPITUMO AMACHI Abakaliki L.G.A of Ebonyi State.












**Below are the geological sections and lithology encountered during the core drill.**

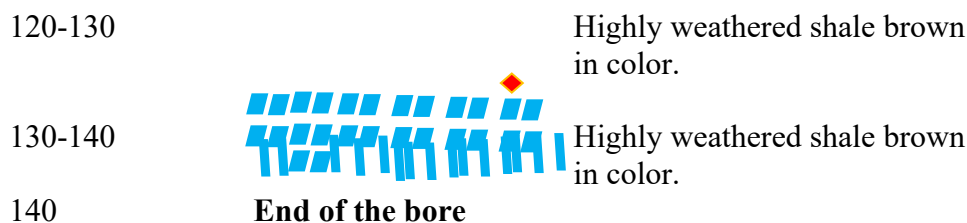
**TABLE 1: NEAR THE HEAP OF IRON STONE OUTCROP**

Time frame (day)	DEPTH (F)	Geo-stratigraphy cross section STRATIGRAPHY	LITHOLOGY DESCRIPTION
4 DAYS			
	10 - 20		Laterized soils mixed with blackish iron stone
	20-30		Quartz with intercalation of marbles stone
	30-40		Heavy plastic clay deposits
	40-50		Clay soils grey in colour
	50-60		Clay soil with poor intercalation of mud stone
	60-70		Clay soil with assorted mud stones persisted
	70-80		Weathered shale formation
	80-90		Weathered shale formation.
	90-100		Weathered shale formation.
	100-110		Weathered shale formation.
	110-120		Weathered shale formation.

120-130		Homogenous shale formation weathered
130-140		Homogenous shale formation weathered
140-	End of the bore	

Logged by Dr. Nwabineli E. O.

Table 2 Geo-stratigraphy cross section at VES 1			
DURATION	DEPTH (F)	SRATIGRAPHY	LITHOLOGY DESCRIPTION
6 days	0-10		Surface laterite soil
	10-20		Some quantity of laterized weathered soils reddish in color- highly oxidized.
	20-30		Brown hard plastic clay.
	30-40		Highly weathered shale with little intercalation of mudstone.
	40-50		Medium grain pebbles with intercalation of mud stone.
	50-60		Mud stones mixed with silt
	60-70		Fractioned sandy shale brown in color.
	70-80		Highly weathered shale brown in color.
	80-90		Highly weathered shale brown in color.
	90-100		Highly weathered shale brown in color.
	100-120		Highly weathered shale brown in color.



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**TABLE 3 GEOLOGICAL CROSS SECTION OF THE CORE DRILL AT VES 2**

DURATION	DEPTH (F)	STRATIGRAPHY	LITHOLOGY DESCRIPTION
12 days	0-10		Grey- brown sandy clay with some coal fragments.
	10-20		Silty sand light grey,
	20-30		Indurated sand stone extremely high
	30-40		Very dense, sandy silt.
	40-50		Quartz mixed with mud stone.
	50-60		Sandy gravel highly indurated.
	60-70		Granite highly indurated.
	70-	End of drilling	

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### Result and Discussion

From the result and analyses of the core drill log it was notice that the lead zinc deposits are deeply seated as suggested by the integrated geophysical methods employed in the prior investigation and studies. The over burden thickness is also massive varying from 40 meter to 60 meters across the area. This means is not economical advisable to engage in mining in the area except if underground mining with bolt and shaft should be employed. This could be the reason why no mining activity is taking place in the area.

However, the core drilling at VES 2 seems to have a lot of indicators, due to encountered highly cemented granitic formation. We therefore suggest to the company to employ the services of a bulldozer to excavate the land to the depth of 100ft or employ the use of high pressured compressor rig to penetrate to that depth. Several ore bodies or deposits can have a similar signature, hence the core drilling activity will help to ascertain the information.

The VES points where the core drill was carried out was chosen based on recommendation of geophysical/geological survey.

However the survey report suggested the lead mineralization faults/anomaly occurred in a deeper formation.

### **Recommendation and Summary**

From the result and analyses of the core drill log it was notice that the lead zinc deposits are deeply seated as suggested by the integrated geophysical methods employed in the prior investigation and studies. The over burden thickness is also massive varying from 40 meter to 60 meters across the area. This means is not economical advisable to engage in mining in the area except if underground mining with bolt and shaft should be employed. This could be the reason why no mining activities is taking place in the area.

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