

FEDERAL REPUBLIC OF NIGERIA
MINISTRY OF MINES AND STEEL DEVELOPMENT (MMSD)
MINERAL SECTOR SUPPORT FOR ECONOMIC DIVERSIFICATION
PROJECT (MinDiver)

TERMS OF REFERENCE

For the engagement of a Consulting firm to Conduct Geochemical Mapping over a target area to complement the airborne geophysical survey to aid in the definition of metallogenic belts within the area of investigation

1.0 INTRODUCTION

The Federal Government of Nigeria has obtained a credit/loan from the International Development Association (IDA) to fund the Mineral Sector Support for Economic Diversification (MinDiver) Project. The project has the following development objectives:

- To improve the attractiveness of the Nigerian Mining sector, as a driver for economic diversification, for long-term private sector investment in the exploration and production of minerals.
- To create a globally competitive sector capable of contributing to wealth creation, providing jobs and advancing our social and human security.

2.0 BACKGROUND

The solid mineral sector's growth and contributions to GDP have remained less than ideal, accounting for only about 0.33% in 2015. To address this, the Ministry of Mines and Steel Development (MMSD) developed a roadmap for mining growth and development with objectives to deepen sector reforms, attract new investors and collaborate with a wide network of partners and stakeholders to rejuvenate the sector and build a prosperous economy propelled by inflows from the solid minerals sector.

The overall aim of the MinDiver Project is to link with the Roadmap and enhance the mining sector's contribution to the economy by strengthening key government institutions, improving information infrastructure and knowledge, and fostering domestic investment in the sector. The Project consists of the following parts:

Part A. Establishing a Strong Foundation for Mining Sector Development

- Carrying out of a program of activities designed to strengthen the MMSD's capacity for governance and administration of the mining sector.
- Carrying out of a program of activities designed to strengthen the Nigerian Geological Survey Agency as well as geological knowledge and information infrastructure for the mining sector,

- Implementing a program of activities designed to strengthen the stakeholders' capacity for management of environmental, health and social impacts in the sector.

Part B: Project Management and Coordination

- Strengthening the capacity of the MMSD for implementation, supervision and management of the Project through the provision of goods, consulting services, non-consulting services, operating costs and training for the purpose.
- Supporting quality control of Project activities and outputs as well as monitoring and evaluation of Project outputs and results.

The key results of the project will include:

- Increased availability of precompetitive geo-science data enhancing mineral transactions.
- Institutional information systems integrated with multi-sector planning tools.
- Incentives created for Artisanal and Small-Scale Mining (ASM) formalization
- Improved environmental and social compliance by mining industry operators.

3.0 CONTEXT

The Ministry of Mines and Steel Development has strongly recognized that the lack of adequate geosciences data is a major factor inhibiting the realization of the key objectives of its Roadmap for growth and development of the Nigerian mining sector. Consequently, the Federal Government of Nigeria embarked on the National Integrated Minerals Exploration Project (NIMEP) to attract private sector investment into mineral exploration and mining sector. The Objective of the NIMEP is to generate credible Geosciences information in Greenfield and Brownfield prospects from exploration to resource size estimation. This is expected to spur the needed investment into the mineral sector that will generate foreign exchange, substitute for imports and develop the local industries for employment generation and wealth creation along the mineral value chain.

In addition to the above, a drive to generate more geoscience data was embarked upon by the Mindiver by carrying out an Airborne Geophysical Survey using High Resolution Airborne Magnetic - radiometric (Magrad) data generated over proof of concept areas. This is to provide composite Magnetic, Radiometric and Geochemical dataset that would allow delineation of metallogenic belts within the proof of concept areas and consequently lead to future exploration targeting.

The MMSD has also planned to embark on major exploration of Future mineral commodities that will meet the demand of clean energy mineral resources and support the global concern on use of fossil fuels for energy supply.

Geochemical mapping has been very useful tool in defining metallogenic provinces in several countries of the world. Recent efforts made to conduct geochemical studies in Nigeria in recent times was carried out by the NGSA under the National Geochemical Technical Assistance Program with the support of World Bank Sustainable Management of Mineral Resources Program (SMMRP) between 2006-2010 where 4 cells covering 144 (1:50,000) maps were mapped. NGSA has extended the geochemical mapping campaign by completing additional 8 (1:50,000) maps at high density using the airborne radiometric interpretation results to complement the geological mapping and also to identify rock alteration pattern that matches perfectly with the results of laboratory analysis which gave undisputed tracks of mineralization.

It is a clear knowledge that one requires to set up a 25 teams of not less than 5 trained geoscientists in a team to be able to effectively map an area of 200,000 km² at a sampling density of 1:20km² over a period of 5 months. The Agency and no other body in the country or a consulting firm can provide that pool of trained geoscientists with office structure spread in all states of the federation.

The Agency is therefore well positioned and has sufficient knowledge, expertise and manpower to provide the needed counterpart human and technical requirement to carry out the high-density geochemical mapping exercise under consideration.

MMSD requires a Consulting Firm to work with the geochemical mapping Teams set up by NGSA as counterpart staff. The Counterpart staff will comprise the Director Economic Geology as the Head and will involve a total of one hundred and twenty-five (125) Geo-scientists to form the 25 teams required to complete the assignment. For administrative ease, supervision and data collection will be decentralized through the division or clusters of smaller cells for ease of access and communication.

4.0 OBJECTIVE

The main objective of this work is to carry out geochemical sampling to delineate targets for further mineral exploration in the target area with the proof of concept areas covered by the High Resolution Airborne Geophysical Survey being carried out to generate integrated Geoscience information which will spur desirable investment into the mining sector and generate foreign exchange, substitute for import and develop local industries, create employment and wealth along the mineral value chain.

As the high-resolution airborne survey and topographical mapping activities are currently underway, and data from these activities will first need to be interpreted and undergo QA/QC in “batches” covering different zones which will then inform the targeted geochemical mapping areas. As a result, excellent coordination will be required between this assignment and those being carried out by the airborne survey and topo mapping. The consultant is expected to take initiative and set up regular planning meetings with the airborne geosurvey team. Inclusion of NGSA staff in those regular coordination meetings is critical.

Furthermore, the airborne geosurvey, topo mapping, together with the geochemical survey and their integrated interpretation are necessary inputs for the investment promotion activities undertaken by the MMSD, and is critical to the achievement of the MinDiver Project Development Objective within the project's lifetime. As a result, in addition to upstream and downstream communication, integrated planning will be critical as well. Regular meetings should be held with the consultants (to be appointed) who will perform the integrated interpretation of all geological data and the investment promotion teams so that robust planning can be undertaken.

In terms of priority targets, based on previous geological knowledge and to be updated by the airborne geosurvey, important emphasis has been put on the areas that appear more prolific and with higher prospectivity for mineralization which are widespread in several States and their extent is shown below, (Fig. 1). The shaded area has been sampled at different times by NGSA, NGSA/BGS, at low density. Additional sampling points are required to increase the density of sampling.

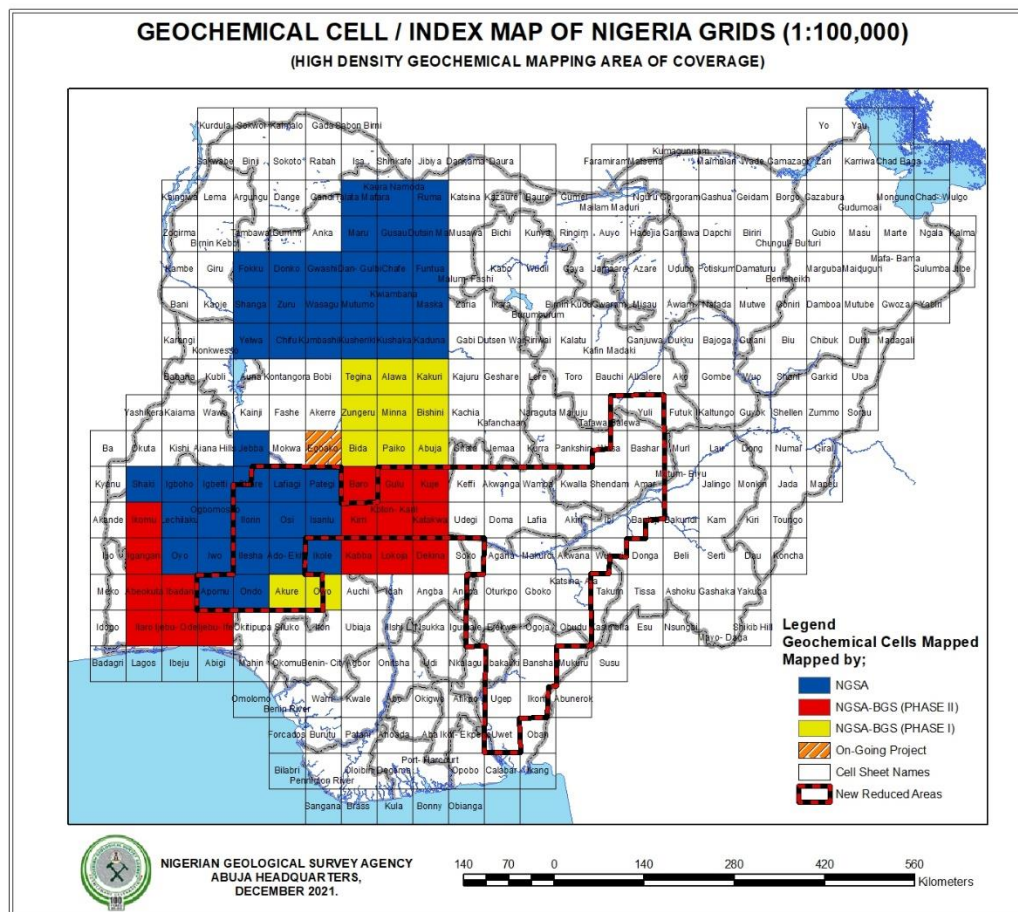


Figure 1: Map of Nigeria showing geochemical cells and project area

5.0 METHODOLOGY

Geochemical Sampling at strategic level and with varied media shall include stream sediments, soil and rock sampling at 1/20 km² medium density on district scale. The sampling is to be carried out using standard procedures as follow:

- Soil - through shallow pitting, cliff surfaces and road cuts to depth of 3m to collect sample using Auger or pitting.
- Stream sediments - sampling first/second order streams using nested sieve sets of appropriate sizes (<150µm sieve) are recommended by the NGSA and within the delineated districts from section A above at 20km² density to obtain 100g of <150µm sieve fractions.
- Collection of representative rock samples (not less than 200 samples) and analysis for major, trace and rare elements
- Provide metallogenic maps and reports defining different target areas of mineralization within the proof-of-concept areas

Provide geological report with adequate analysis on 1:50,000 scale of identified tracks of mineralization and targets, defining lithologies, boundaries, contacts and horizons favouring mineralization.

The Consultant is invited to comment on the adequacy of these TORs and suggest improvements.

6.0 SCOPE OF ACTIVITIES:

The MMSD desires to engaging the services of a competent consulting firm to achieve the core objectives of this assignment as follows:

a). The consultant will carry out a literature review at the scoping stage and would be required to organize a stakeholders' workshop before the commencement of field activities. The workshop would provide experts (including all other consultancies involved in the geological survey activities, throughout the area and with state and community representatives as appropriate) the opportunity to peer review past geochemical mappings executed by NGSA/BGS and later NGSA to share information, data and results and also to identify challenges and provide solutions for mitigation. The peer review will afford the consultant the opportunity to share information with experts and to agree on the best concept to adopt. The consultant shall avail the experts peer group their understanding of the assignment and the methodology to be deployed to achieve the objectives of the assignment. The experts for the peer review would comprise all 25 team leaders from NGSA, representatives of the consultants involved in the geological survey activity, representatives from the investment promotion activity, and 5 Resource Persons from the relevant stakeholders to be identified by the MinDiver Project and NGSA.

b). Develop a scheme for a detailed programme of field activities for the Geo-Chemical Mapping of selected areas targeted under the proof of concept in Nigeria.

c). Together with the staff of NGSA will undertake geochemical sampling of stream sediments, soil and rocks for geochemical analysis and elemental concentration maps on 30 topographic sheets maps of 1:100, 000 series. The number amounts to 120 sheets on a scale of 1:50,000.

d). The consultant will also support NGSA to provide overall project management expertise. The Consultant will produce monthly project reports including progress against a detailed Gantt chart and produce S-curves to track actual progress against planned progress. This will be submitted to NGSA and the MinDiver PIU for inclusion in a monthly progress report. Risks to timely and high-quality execution will be identified by the consultant and remedial actions recommended. The consultant shall proactively identify and manage risks of all nature (technical, regulatory, stakeholder engagement, COVID-related, commercial, avoid restriction of access to incomes sources for locals in targeted areas, land acquisition, none use of child labour / labour management process / administration of worker's code of conduct etc. within the sample density) and escalate issues as necessary if quality or timing become compromised.

e). As part of the joint field data gathering exercises, the consultant shall monitor and assess techniques adopted by the NGSA, suggest improvements and design capacity building activities to develop experts in the domain of geochemical sampling collection, processing and interpretation.

f). Geological mapping & regional geochemical sampling

i). High density geochemical mapping

The last Geochemical mapping was carried out on sampling density range of 1:50-75 km². The current geochemical mapping is to be carried out on 1:20 km² sampling density, and the sampling media are stream, soil and rock. Nigeria is divided into 44 Global Reference Network [GRN], and each cell is divided into nine 1:100, 000 map sheets out of which 8 cells are partially located in Nigeria.

ii). Selection of Site Areas

The high-density geochemical mapping areas (proof of concept areas) are within the proposed airborne survey target areas, the integration of the airborne survey results and the geochemical mapping will ensure the achievement of project development objectives, which is currently at risk due to COVID and other delays. This is to aid in the definition of metallogeny within the area of investigation.

The selected area covers approx. 4 GRN cells consisting of 120 quarter degree Sheets. The selected areas are the Proof of Concept and NIMEP¹ sites that shows high geochemical anomalies from results of the previous low density Geochemical Mapping and the few random sampling trends revealed from the NIMEP Phase 1. These areas also fall within the areas covered by the ongoing Airborne Geophysical Survey.

g). Geochemical laboratory analysis & geostatistical assessments (Laboratory Analysis)

Sample preparation would be carried out by the National Geosciences Research Laboratories (NGRL) Kaduna or any other any other suitable Laboratory. The Consultant shall work to ensure timely delivery of sample results and high-quality results.

Thin sections and microscope studies (petrography) on collected rock samples will be prepared and analysis of samples at various levels for determination of multi-elements which includes major, Trace and Rare Earth Elements using ICP-MS.

The number of samples per sheet (1:100,000) shall not exceed the following:

160 stream sediments,
160 soil samples and
40 rock samples,

This gives a maximum of 18,360 samples (360 samples x 30 sheets (1:100,000)).

h). Integration, final interpretation, internal quality control, monitoring and supervision (Integration and Dataset Interpretation) shall be carried out by the Consultant.

The Consultant will be required to provide an internal Quality Control methodology and ensure compliance with the methodology.

i). The consultant will provide capacity building and knowledge transfer to 125 NGSA staff by way of pre-field lectures, on-the-job training or on-the-field demonstration in addition to quality control procedures and data interpretation methodologies. Further training needs shall be identified and submitted to NGSA and the PIU.

j). Recommend Equipment and Software to be procured and supervise the installation as may be required. The consultant will perform a review of existing equipment and software and their adequacy within the NGSA. The consultant shall compile a list of equipment and prioritize purchases in terms of urgency. This will include a technical justification of the equipment, a view of the NGSA's ability to maintain and operate it,

¹ National Integrated Mineral Exploration Project.

as well as the necessary skills and expertise. This will allow the MinDiver project to make an educated assessment of equipment needs.

k). The Consultant shall monitor and review field work carried by the teams based on the agreed technical proposal work-plan in order to ensure compliance with Total Quality Management objectives, procedures, accuracy, standards and specifications.

l). Ensure that all the quality management techniques and procedures put in place are complied with.

m). Conduct a desk-based review of all relevant documents produced by the teams during implementation.

n). Monitor, assess and oversee the teams to ensure correct procedures for greater efficiency.

o) Working closely with the project Environmental and Social safeguards specialist, the consultant shall ensure compliance with relevant environmental and social procedures and provision (as documented in the RPF and ESMF) and mitigate any negative impact to local communities, sources of water, soil, involuntary land acquisition/ restriction to income sources

7.0 COORDINATION WITH ONGOING MINDIVER ACTIVITIES

The areas selected in the geochemical survey will need to be identified in the same order as the Geophysical Survey Mag-Rad BLOCKS which are being conducted. This means that the Geochem Survey development /progress has to be, as much as possible, aligned with the areas being covered by geophysics. Noting that the geophysical survey has divided the survey area into BLOCKs A, B, C, etc to be flown in sequence, the field Geochem must follow the same order, including analysing samples and statistical processing (in batches by BLOCKS).

This is because the geophysical and geochemical work must be gradually integrated to obtain “preliminary geological interpretation results” in a timely fashion by each of the BLOCKS to optimize time to generate preliminary interpretation products. It is well understood that this way of proceeding is not the common one when planning a standard regional geochemical survey. However, this point is obviously not applicable to a general orientation survey whenever needed.

The contractor will be required to obtain from MinDiver the satellite datasets derived from the MGCP topographic mapping work over the same areas where the priority BLOCKS A, B, C, are selected. This is necessary in order to use such imagery products (natural colour satellite orthoimages plus 3D Anaglyphs) to plan and select sampling points on the basis of geomorphological features and drainage patterns.

8.0 ENVIRONMENTAL AND SOCIAL SAFEGUARD

The activity will be carried out with high regards to environmental and social sustainability of the entire exercise. The Consultant will execute the task with particular consideration to environmental and social risks that will arise in the cause of the implementation of the high-density geochemical mapping which include: potential for soil erosion, release of airborne particulates, and disposal of waste rocks and unsuitable. Also, the management of laboratory effluent from lab analysis; potential contamination of streams and water bodies from the subproject activities; occupational health and safety; chance find etc., will be taken into consideration.

Other considerations which will require the appropriate Environmental & Social instrument include: potential risks of restriction of access to land / livelihood generating sources, labour and working condition / child labour, Gender Based Violence (GBV), Sexual Exploitation and Abuse (SEA) and Sexual Harassment; potential interaction with toxic substances etc.

All the above activities shall be executed in consonant with the approved ESMP for this activity. The MinDiver PIU has expertise embedded within the team who are familiar with World Bank safeguards requirements. The Consultant shall work closely with this team on all safeguards related issues and ensure compliance to the provision of the ESMP.

All the communities within the area of coverage of the Geochemical mapping should be mapped and sensitized on the assignment, its potential impact, proposed mitigation arrangement and available channel for grievance reporting. This exercise will be coordinated by the Project Social Safeguard unit in collaboration with the state State Mineral Resources and Environmental Management Committee (MIREMCO) structures. This is important in order to keep the community informed about the field visit of various teams, the purpose of the fieldwork and its benefits to Government in general and the community in particular. To ensure full participation and promote ownership, the consultant should consider engaging (gender inclusive) community members for non-skilled jobs, such as night watch, access creation, field guide, etc. These arrangements should be in line with proper labour management procedure with relevant code of conduct set up through formal, simplified contracts – even if there is use of day-labourers. The consultant must not forget to involve the community leaders in hiring any unskilled labour, meaning that the community leaders must be involved in the selection of such labour. This will help minimize issues of grievances caused as a result of the implementation of geochemical mapping exercise. As the Consultant seeks to hire labour, they should give consideration to selecting a gender balanced representation of labour to ensure opportunities are inclusive of women.

Lastly, the Consultant shall work with the NGSa and the PIU to ensure the security and occupational health and safety of all staff engaged in the activity. Government will lead and advise on issues of security in risky areas. The Consultant is not expected to provide or hire private security forces. All security requirement / arrangement will be the responsibility of the project through the relevant government agency/ies adopting

international best practice including relevant code of conduct, none use of excessive force and human rights requirement.

8.0 CONSULTANT'S QUALIFICATION AND EXPERIENCE

The Bidding firm must be of international calibre with at least 10 years proven experience in geology/geochemistry and data processing. The firm must have completed at least 3 projects of similar capacity (technical and Financial) in the field of geological mapping, sampling and in GIS. At least 1 (one) of the similar projects should be produced in countries at a similar state of development, particularly in emerging markets, or sub-Saharan African countries.

The Firm Must have in its team an internationally recognized competent person (CP) and a registered member of any of the international bodies of Public Reporting of mineral exploration results, mineral resources and mineral reserves, such as AusIMM, SAMREC, etc.

The Bidder must be able to demonstrate logistical, technical and human resource capacity for the full completion of the assignment and associated deliverables.

Firm Staff Experience

The team shall include a Day-to-Day Project manager and key experts for each of the necessary expertise:

- 1) **The Project Manager (1No.)** The project Manager must hold a master Degree in Geology or its equivalent and must be a competent person with proven experience of at least twenty years in the field of target mineral exploration (Mineral exploration, evaluation, assessment, target geological mapping and appraisal, etc) and at least 5 years in management of similar project of the same scope. It is advisable that the project manager holds some project management certification, eg. PMI, PRINCE 2, or others.

The Project Manager has the following responsibilities:

- i. Responsibility for the day-to-day management and tracking of the project.
- ii. Responsibility for all negotiations and joint planning with the client, government officials, and other stakeholders including management of the relationships.
- iii. Responsible for the smooth running of the works, and the coordination of the technical members of his team. He will guarantee the quality of results and deliverables at all stages.
- iv. Coordinate internal resources, both local and international team of experts towards the flawless execution of the project
- v. Set the technical direction of the project and define the project scope, schedule, objectives, costs and approaches.

- vi. Develop detailed project plans to monitor and track progress.
- vii. Meeting client needs within quality, time, and cost conditions using appropriate verification techniques.
- viii. Lead the entire project through all the phases of the project.
- ix. Report on the project activities and progress with the client and address all concerns raised by the client.
- x. Integrate with other geological survey activities and consultancies (topo, airborne geosurvey, integrated analysis) and the investment promotion workstream and team.

Key Staff of the consulting Firm's Team:

The profiles of the key personnel of the Consulting Firm should include the following expertise and experiences; Should have not less than fifteen [15] years of professional working experience in their respective fields. They should also have a minimum education of a first degree in their field of experience as well as requisite professional certification. They should collectively demonstrate an even spread of expertise in the required areas that will arise in executing the tasks outlined herein. Key experts **may** also include Nigerian individuals who have extensive experience in the relevant fields as they relate particularly to Nigeria.

- **Expert Exploration Geologists, (2Nos):** Holder of a degree in Geology or equivalent, Specialist in interpretation of geological and metallogenic data with a mining context like Nigeria; She/he should also have professional experience in corporate, operations, project management, consulting, strategic planning, for all range of mining projects in diverse commodities in senior operating positions. A track record in taking projects from exploration to the development stage with the completion of mineral resource assessment, preliminary economic assessment, pre-feasibility and a feasibility studies, together with experience in mining projects in Africa.
- **Expert Geologists, (2No);** with relevant educational qualifications in geology with professional experience in mineral exploration. The adviser should have a track record of working on projects from prospecting, early-stage exploration to advanced stage exploration and finally mining. Commodity experience with tin, copper, tungsten, tantalum and demonstrate experience in West Africa and a good understanding and strong familiarization with the Nigerian mining sector would be an advantage.
- **Geochemistry or Analytical Chemistry Expert (2No.)**
Have a higher degree in Geochemistry, Analytical Chemistry or similar and an undergraduate degree in geology, chemistry, earth science, or similar. Possess strong managerial abilities and ten to fifteen years of experience in Geochemical Exploration, Analytical Chemistry and laboratory analysis. Be fully conversant with international best practice in mineral sample handling, preparation, processing and analysis for geochemical properties including gas

chromatography, carbon and isotope data, viscosity and solvent extraction. Familiar with sample tests and checks, Excellent understanding of mineral analysis techniques and reporting requirements are essential. Possess excellent interpersonal communication skills. Demonstrate a high level of technical skills and lab procedures including Mineral Sample Processes and analysis, Presenting Technical Information, Management Proficiency, Quality Focus on QA/QC requirements in a working Geological Lab and an excellent understanding of ISO standards, QA/QC, standing instructions and method statements. Professionally qualified as a chartered member of a recognised institution.

- **Expert cartographer (2no)** Holder of a degree in mapping/cartography or equivalent. Justification of proven experience in the interpretation of digital map data and the work involved in the preparation of supporting GIS.
- **GIS Expert, (2NO);** Strong GIS skills and understanding of geospatial analysis, integration, and data management. Demonstrate ability to work and complete assignments independently.
- **Environmental and Social Development Expert (2NO):** The expert will have relevant educational qualifications in environmental sciences or related field from a recognised university with 5 years of practical post –qualification experience in environmental and social impact analysis, planning, mitigation, and management, She/he will have demonstrated expertise in the design and implementation of environmental and social management plans, environmental and social impact assessments, environmental and community development. She/he will have demonstrated skills in working effectively with public sector clients, and in implementing effective consultation and participation in project at community levels, especially in Nigeria.

The Consultant is also expected to provide staff to work with NGSA in the field to ensure compliance with standard procedures. This can be one of the above but could be additional depending on the intensity of activities over the life of the Geochemical mapping.

Foreign Bidders are expected to include local experts in their team in view of the challenges posed by COVID-19 Pandemic.

9.0 LOGISTICS AND COUNTER PART STAFF

9.1 LOGISTICS REQUIREMENT

To underpin an effective implementation of capacity building to the embed NGSA staff, the consultant must work with all the embed NGSA staff in all phases of the assignment from data acquisition, management, analysis and interpretation of results

across the three main aspects of the assignment, viz: geological mapping, stream sediment, soil and rock sampling.

One hundred and twenty-five (125) NGSA geoscientists are targeted to form the 25 core teams for data acquisition. There are a total of 120 sheets to be mapped by the 25 teams. Each team requires a Four-Wheel Drive Field Vehicle for a period of at least 5 months. In addition, each team require a set of sieve-net and 2 units of drilling Auger.

Nos of NGSA staff in a team	Total nos of Core team	Total number of NGSA Staff required	Period Required (months)	Field Vehicle required	Sieve nets required (sets)	Drilling Auger required (2 per team)
5	25	125	8	25	35	50

A Total of 120 maps on scale of 1:50, 000 spread across the GRN cells made up the total area of coverage. The Consultant will later merge these maps to produce 30 maps on scale of 1:100,000 as final deliverables being the standard scale for the GRN cells. A team requires at least 30 days to complete a sheet of 1:50,000 series.

For ease of administration, the Ministry of Mines and Steel Development shall provide all Logistics requirements for its staff for the field work. The Consultant on the other hand will be responsible for its team's logistics requirement.

All the 25 teams will be coordinated by the Director of Economic Geology, NGSA who reports to the Director General, NGSA. Close coordination with the Director NGSA is critical and given other commitments, plans should be agreed long ahead of time to avoid delays in implementation.

The Consultant will work with the NGSA Coordinator assigned to the project to ensure that :

- All sampling procedures in various teams are strictly adhered to.
- All samples are properly labelled, documented in the field and safely forwarded to the designated Laboratory for preparation and management.
- Monthly progress report is completed and submitted
- Facilities at NGRL and any other laboratory to be used for analytical services are of standard quality and internationally acceptable.
- Assist to identify and properly manage risks.

The overall coordination of this activity shall be carried out by the Mindiver Project.

10.0 COUNTER PART STAFF REQUIREMENT

The Consultant will provide capacity building and training to 125 NGSA staff at a suitable location in Nasarawa State. The capacity building shall assist in ensuring proper compliance to standard procedure as may be introduced by the consultants.

11.0 REMUNERATION AND PAYMENT TERMS

Remuneration of the consultant is commensurate with those offered by international bodies for similar assignments. The assignment will be based in Nigeria. However, the consultant will also be reimbursed for operational expenses such as travel, accommodation, and telephone incurred while carrying out this assignment and in line with World Bank guidelines and procedures. Before reimbursement can be made, the consultant firm will need to submit a statement of expenses supported by valid documentation.

The successful consultant would be paid on time based at an agreed rate of professional fee, subject to satisfactory performance and timely receipt of deliverables.

12.0 DURATION OF THE ASSIGNMENT

The assignment would take place within a period of **7 months**. The Bidder must be able to demonstrate logistical, technical and human resource for the full completion of the activity and associated deliverables within the stipulated time.

13.0 OUTPUTS & DELIVERABLES

13.1 The consulting firm will produce the following **reports**:

- **An Inception Report** to outline the work plan of the consulting firm, define its tasks and the planned implementation periods and schedules, identify target submission dates on each task. Particular attention will be given towards the planned coordination with other teams and preparation of a detailed schedule in chart form. The inception report will be submitted within 14 days **of the commencement of the assignment** and once approved and issued in its final form, will serve as the Consulting Firm's baseline (or Project Charter) for the management and monitoring of the tasks.
- **Progress reports of activities carried out**; The Consulting Firm shall prepare monthly Progress Reports covering progress towards achieving the objectives in this ToR with a summary report completed every quarter. The reports shall provide a brief, but **comprehensive end-of-month progress of the activities carried out**, details of impediments to the works and proposals for overcoming them. These reports shall be submitted within the first week of the succeeding month or quarter. The report will be submitted to the "MinDiver" Project Co-ordinator for assessment by the PIU/NGSA.
- **A Mid-term Report**, within the third week of the third month of the assignment (at **Month 3**)

- **A georeferenced database file** including primary sample data, and interpretations with all necessary information and in a format compatible with existing and future geodatabases used by the MMSD, including the decision analysis tool.
- **A draft final report** within the first week of the last month of the assignment.
- **A Final Report** (at **Month 7**) bound in Five (5) copies and an electronic copy, This Report will incorporate in the Annexes all the information that is relevant regarding the internal QA/QC process that has taken place.

SUMMARY for Parameters to be used:

- Estimated total number of samples to be analysed for all the 120 map sheets is 10,800.
- The density for geochemical sampling is 1:20 sq.km
- Geochemical sampling analysis will expect results using: ICP-MS for major oxides, trace and rare earth elements

13.2 The consultant will prepare the following deliverables.

- Guidelines for ensuring best practice
- Report of each activities of the geochemical mapping program detailing work carried out, methodology, assumptions, limitations and findings.
- A peer reviewed technical report of each GRN cell with details of identified targets, permissible tracts of mineralization and verifiable data.
- A CP shall prepare and package final report for each geochemical GRN cell.
- Report of capacity building and knowledge transfer.
- Geochemical maps of 47 elements published on a scale of 1:50,000 for the 4 GRN cells covering the area of sampling, equivalent to 120 map sheets on a scale of 1:50, 000
- 30 Geochemical map sheets on a scale of 1:100,000 produced by merging 120 maps on a scale of 1:50,000 covering 47 elements
- Trained personnel, 125 NGS professionals of various geosciences backgrounds.
- Deliver the adapted Geochemical Mapping Manual to the MinDiver Project.
- Present results of confirmatory laboratory tests conducted overseas.
- Regular monthly and quarterly progress reports
- Present all Training Reports
- Present all Workshop Reports including the adapted manual.
- Present all purchased items from re-imbursable expanses, such as equipment, vehicles, software, base maps, etc to the MinDiver Project after the closure of Contract.
- The Consultant shall submit a capacity Building plan while submitting its inception Report.

The reports will be assessed and appraised by the Project Coordinator and the DG NGS

Note:

All Reports Shall Be in English and Presented in Hard and Soft Copies. All reports will be reviewed by the Project Coordinator.

THE CONSULTANT WILL SIGN A CONFIDENTIALITY and NON DISCLOSURE AGREEMENT WITH THE PIU (Project Coordinator overseen by the World Bank). Non-compliance will be subjected to legal penalties not inferior to the Full Cost of the Contract.

NO FINAL PAYMENT WILL BE MADE UNTIL QA/QC HAS BEEN PASSED

14.0 SELECTION METHOD

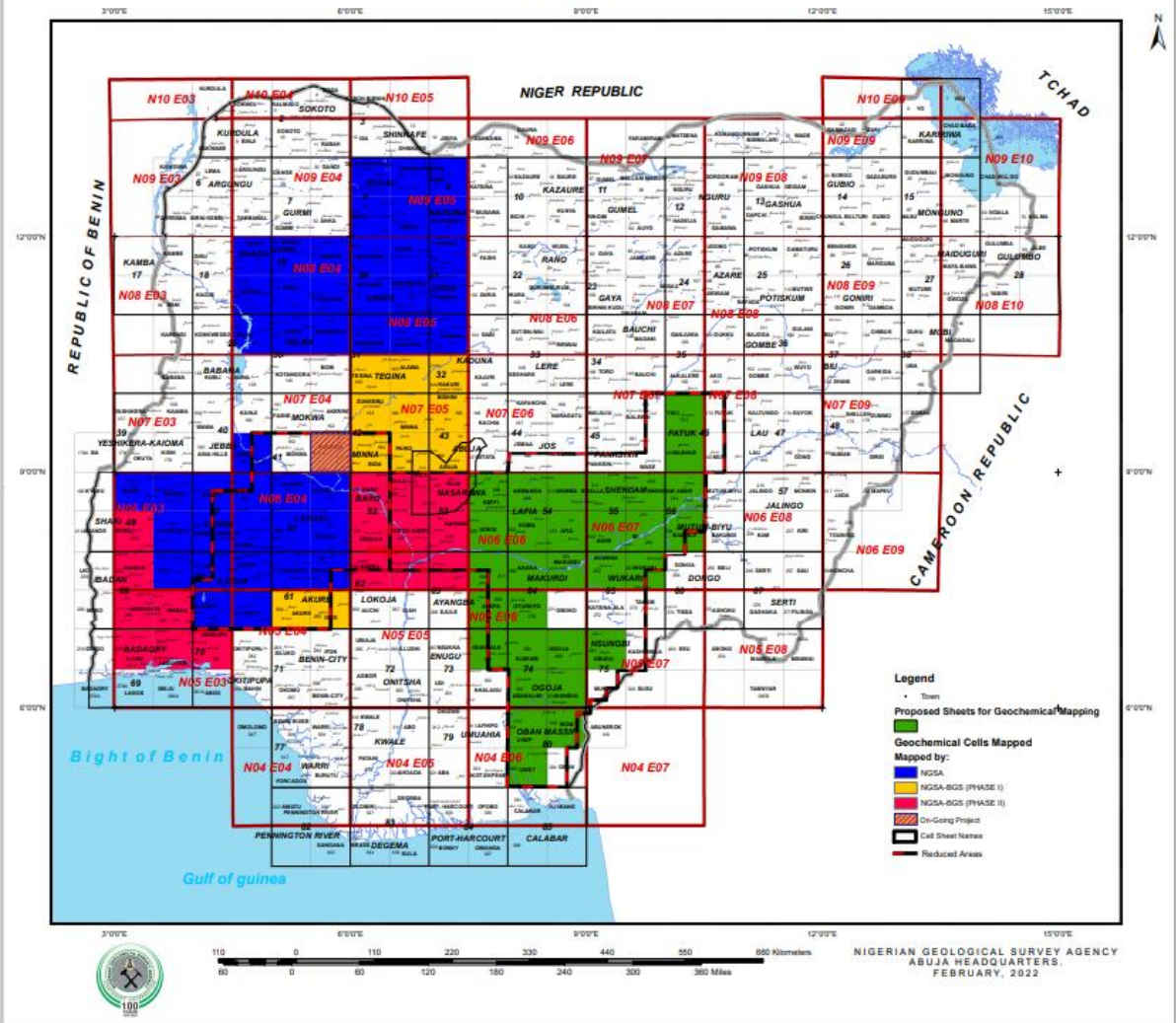
The consultant will be selected through QCBS selection method

15.0 Improvement to the TOR

The consultant is recommended to suggest improvements to this TOR as part of their submission. The consultant is also encouraged to submit any changes to costs that would results from the suggested amendments.

APPENDIX 1

GEOCHEMICAL CELL / INDEX MAP OF NIGERIA GRIDS (1:100,000 & 1:250,000)
(REDUCED AREAS)



APPENDIX 2

PROPOSED SHEETS FOR GEOCHEMICAL MAPPING

1. SHEET 323 UWET
2. SHEET 314 UGEP
3. SHEET 315 IKOM
4. SHEET 303 ABAKALIKI
5. SHEET 304 BANSHA
6. SHEET 288 IGUNMALE
7. SHEET 289 EJEKWE
8. SHEET 290 OGOJA
9. SHEET 291 OBU5DU
10. SHEET 269 ANKPA
11. SHEET 270 OTURKPO
12. SHEET 250 AGANA
13. SHEET 251 MAKURDI
14. SHEET 252 AKWANA
15. SHEET 253 WUKARI
16. SHEET 233 IBI
17. SHEET 234 BANTAJI
18. SHEET 250 AGANA
19. SHEET 232 AKIRI
20. SHEET 230 DOMA
21. SHEET 229 UDEGI
22. SHEET 208 KEFFI
23. SHEET 209 AKWANGA
24. SHEET 210 WAMBA
25. SHEET 211 KWALLA

26. SHEET 212 SHENDAM
27. SHEET 213 AMAR
28. SHEET 192 BASHAR
29. SHEET 171 YULI
30. SHEET 170 TAFWA BALEWA

30 Sheets x 4 (1:50,000 series) \approx 120 Sheets

1. HIGH DENSITY GEOCHEMICAL MAPPING, AREA BOUNDARY COORDINATES

1	HIGH DENSITY GEOCHEMICAL MAPPING COORDINAT OF AREA BOUNDARY							
2	X	Y			X	Y		
3	4.759092	9.002796			8.892926	5.928186		
4	6.001533	8.997071			8.87575	5.498771		
5	6.007258	8.487498			8.492139	5.48732		
6	6.511105	8.498949			8.509316	5.006375		
7	6.511105	8.997071			7.999743	5.006375		
8	9.505558	8.997071			8.01692	6.495013		
9	9.505558	9.231817			7.74782	6.489288		
10	9.763207	9.248994			7.753545	7.496981		
11	9.763207	9.993313			7.994018	7.491256		
12	10.50753	9.999039						
13	10.51898	8.264202						
14	10.24988	8.247026						
15	10.24988	7.995102						
16	9.992228	7.995102						
17	9.992228	7.743179						
18	9.757481	7.748905						
19	9.74603	7.502707						
20	9.488381	7.502707						
21	9.494107	6.500739						
22	9.007437	6.495013						
23	9.007437	5.933911						