ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) FOR THE CONDUCT OF HIGH-DENSITY GEOCHEMICAL MAPPING OVER A TARGET AREA UNDER THE MINDIVER PROJECT

MinDiver

Mineral Sector Support for Economic Diversification Project

Final Report

Environmental and Social Management Plan (ESMP) for the Conduct of High-Density Geochemical Mapping Over a Target Area under the MinDiver Project

October 2022







EXECUTIVE SUMMARY

ES 1: Background

The Federal Government of Nigeria has embarked on an economic diversification campaign with the aim of leveraging on the nation's vast natural resources to diversify the economy from the oil and gas sector to achieve economic development. The mining sector's growth and contributions to GDP have remained less than ideal, accounting for only about 0.33% in 2015 (Source: MinDiver Project Appraisal Document). To address this, the Ministry of Mines and Steel Development (MMSD) recently 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. Further to these developments, the Federal Government of Nigeria has obtained a credit from the International Development Association (IDA) to fund the Mineral Sector Support for Economic Diversification (MinDiver) Project. The project has the following development objectives: a) 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., b) To create a globally competitive sector capable of contributing to wealth creation, providing jobs and advancing our social and human security. The MinDiver Project has however identified limited geo-information data in respect of mineral deposits which has hampered the growth and development in the sector. To foster the needed development, the MinDiver project has proposed to carry out a geochemical mapping of target areas, to generate geo-information data for the identification of minerals deposits by sampling first and second order streams, soil and rocks; to determine the source and nature of mineralization. For this purpose, the MinDiver project has proposed to apply some of its credit to the preparation of an Environmental and Social Management Plan (ESMP) for geochemical mapping to address the negative impacts that may arise from the project implementation.

ES 2: Project Selection and Location

The proposed geochemical mapping is intended to cover about 6 cells and a total of 30 sheets and 120 Quadrants respectively. The project areas are spread across some rural and semi-urban areas located across 60 LGAs in 10 different states in the North-Central geopolitical zone, North-East geopolitical zone, South-East geopolitical zone and extend towards the South-South geopolitical zone of the country.

Sheet No	Sheet Name	Quadrants
323	Uwet	Abonabung, Mbarakpa, Akpatre Efe, Utuma
314	Ugep	Iyamitet, Atakem, Abini, Anong
315	lkom	Etara, Nkum, Abia, Etiti Ulo
303	Abakaliki	Ofonbonga, Alebo, Ezza Ohu, Idembia
304	Bansha	Abantoken, Njua, Ntara, Obioko
288	Igunmale	Ichamalghama, Agamede, Emezu, Igumale
289	Ejekwe	Obe Jelili, Icheri, Egga, Nduoke
290	Ogoja	Koinyao, Woda, Iboko, Ochegbe
291	Obudu	Manor, Vandeikya, Ogevalav, Onang
269	Ankpa	Amufu, Effa, Boju, Ajeke
270	Oturkpo	Akweje, Aiye, Moi-Igbo, Eron
250	Agana	Udeni, Ududu, Anyamile, Tarka
251	Makurdi	Okabi, Abinsi, Adago, Gando
252	Akwana	Akwana, Fiyayi, Zebu, Muntscheri
253	Wukari	Gidan Idi, Apar, Kado, Zaki Biam
233	lbi	Bwelgan, Shinye, Gurbe Jibu, Uro Tukun
234	Bantaji	Nyankola, Tapare, Gida Adogo, Wuro Jam
231	Lafia	Murya, Obi, Giza, Anum



Sheet No	Sheet Name	Quadrants
232	Akiri	Azara, Kuma, Kanje, Zongo
230	Doma	Maikutukure, Dogon Kurmi, Oponu Doka
229	Udegi	Onda, Bakono, Ushan Rogo, Udegi Beki
208	Keffi	Karshi, Arabishi, Shaba, Bagaji
209	Akwanga	Akwanga, Mada, Garaku, Okporo
210	Wamba	Dengi, Ungwan Bature, Shabu, Assakio
211	Kwalla	Kopar, Namu, Peshiep, Bembem
212	Shendam	Yelwa, Lakushi Makat, Ajikemai, Dutsen Rimi
213	Amar	Gidan Shehu, Kurmi, Gungu, Bangalela
192	Bashar	Ganjuwa, Bowas, Dogo Ruwa, Tungan Wada
171	Yuli	Gogdi, Dada, Matsira, Taksawat
170	Tafawa Balewa	Sabon-Gida, Wurno, Wuro Mayo, Bala

ES 3: Proposed Intervention Works

The proposed activities for the High-Density Geochemical Mapping include:

- Soil sample collection This will be conducted through shallow pitting, cliff surfaces and road cuts to a depth of 3m to collect samples using Auger or pitting.
- Stream sediments sample collection This will be carried out by sampling first/second-order streams using nested sieve sets of appropriate sizes (<150µm sieve) as recommended by the NGSA and within the delineated districts 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.
- Production of metallogenic maps and reports defining different target areas of mineralization within the proof-of-concept areas.

A minimum onsite number of 15 persons per sampling team is envisaged, and a total number of 11 sampling teams has been proposed by NGSA/BGS, hence the total labour size for the geochemical mapping assignment is 165 persons. The proposed duration for this assignment is 12 months. While the sampling could be conducted in both wet and dry seasons, the wet season is recommended because most 1st and 2nd order streams are dried up in the dry season.

ES 4: Description of the Projects' Environment and Social Baseline

All quadrants across the 30 sheets were visited during the ESMP preparation, however for succinctness of this Executive Summary, only a summary is provided here and reference to critical sensititivities across locations while chapter 4 of this report provides details of the E&S baseline of all 30 sheets, environmental baseline and socio-econimic baseline.

General Overview:

In the northern locations, the geography of most catchment areas surrounding the 1st and 2nd order streams within the project locations are mostly of scanty grasslands with patches of shade-providing trees at strategic locations while in the southern locations the vegetation is denser with patches of forested areas around the locations. Most of the 1st and 2nd order streams in the project locations are seasonal, characterized with dryness and low flows during the dry season. In some project locations stream water is used for domestic purposes such as bathing, laundry, and by motorcycle riders (Okada) for washing and cleaning, farming, fishing, nomadic Herders as well take their cattle for watering. Some communities engage in rearing of domestic and farm animals (dogs, pigs, goats, sheep)



There is presence of licensed and artisanal small-scale mining (ASM) activities in some of the project locations including Azara, Assakio, Alkaleri, Akwana etc. while abandoned mining sites were observed in in Murya, Arabishi, Ajikemai and Ajeke. Some previous mining activities has created apprehension against the mining sector in some communities, making community members somewhat hostile toward upcoming mining sector activities.

Security issues such as herdsmen and farmers' clashes, banditry, kidnapping, theft have been on the increase around some of the rural communities across the project locations both in the northern and southern axis.

Taksawat in Yuli (171) fell in an area within the jurisdiction of Yankari Game Reserve which is a restricted area. A permit is required to gain access/entry into the facility. This therefore means that the MinDiver project, MMSD, and NGSA are highly advised to avoid areas within the Yankari Game Reserve for the proposed geochemical mapping and any other future activities within the sector. Some sacred/traditional sites were also identified in katakpa in Wukari (253), Atali Shrine, Eburafugi Stream, Monolith structures, Arena for Men (women are not allowed into the arena) in Ikom (315).

Physio Chemical Analysis:

Soil and water samples were collected. Initially, a total number of 1800 water samples were planned; however, most of the 1st and 2nd order streams were observed to be seasonal (and dried up) during field visits for baseline studies (which was conducted during the dry season) thus resulting in the reduced number of samples collected. A total number of seventy-eight (78) samples for Topsoil (TS) and fifty-six (56) for surface water were analyzed. Soil samples were taken from locations proximal to 1st and 2nd order streams (off the stream banks), etc. (samples were subjected to composite analysis). Surface water samples were collected from 1st and 2nd order streams. Some of which include (Umabe River, Ajiebe River, Ujambe River, Enetue River, Okpokwu River, Akelaka River, Rafintipper River, River Donga, Okpla Stream, Sabon Laya Stream etc.). Air quality analysis was carried out using a Testo 350 XL. Measurements were taken around 1st and 2nd order streams in close proximity to rural communities and hamlets. Noise levels were also collected in a similar manner using a Testo 815 Noise meter. (Refer to Annex 12 – Results of Biophysical Sampling Analysis)

Surface Water: From the physiochemical analysis, all values of analyzed samples are within the FMEnv limits (< 5NTU) except the turbidity of water samples from most 1st and 2nd order streams visited, e.g., 1st order stream at Ntara (Banshar – Sheet 304), 1st order stream at Nkum (Ikom – Sheet 315), 2nd order stream at Yelwa (Shendam – Sheet 212), 2nd order stream at Giza (Lafia – Sheet 231) see annex 12 for more detailsThe Total Suspended Solids (TSS) in the streams was observed to be relatively high thus resulting in the observed increase in the turbidity levels of the streams (e.g., 1st order Stream at Sabon-Gida Sheet 170 Tafawa Balewa (> 500 mg/l). The increase in the Total Suspended Solids (TSS) and subsequently water turbidity may be attributed to the domestic activities (including laundry, swimming/bathing, bike washing, etc.) and also ASM activities of minerals including Barite, Columbite, Lead, Tin, Zircon, Galena, Salt Mining, Sand Mining ore washing and tailing processing (dumping the uneconomic fraction of the ore as part of waste into the streams) which is ongoing at the banks of some of the streams (e.g. Streams in Sheet 252 – Akwana). Nitrate levels were also observed to exceed the FMEnv permissible limits at the 1st order stream at Tungan Wada (Bashar 192), 2nd order stream at Ajikemai (Shendam 212), and 2nd order stream at Giza (Lafia 231).

Soil: The levels for pH, conductivity, Total Organic Carbon (TOC), Soil Organic Matter (SOM) and Phosphate were all within their respective FMEnv Limits respectively. Soil samples contained varying mean levels of heterotrophic bacteria count ranging from 0.16 x 10³cfu/ml to 0.37 x 10³cfu/ml and for fungi ranged from 0.38 x 10³ to 0.48 x 10³cfu/ml. The predominant bacteria were *Bacillus Spp.*, *Pseudomonas Spp. and Salmonella Spp.*

Noise (60dB and 40dB for day and night respectively¹) and air quality² levels of the project area were both within FMEnv and WHO Levels (see footnote below).

¹ The National Environment (Noise Standards and Control) Regulations, 2009.

² National Environment (Air Quality Control) Regulations, 2014. (https://www.nesrea.gov.ng/wp-content/uploads/2020/02/air_quality_control.pdf)



Socio-Economic Baseline Studies (Project Boundaries – 120 Quadrants in all 30 Sheets) (Refer to Annex 18)

Primary Data: A random survey was carried out across all quadrants within each of the 30 sheets under study. Semi-structured questionnaires³ were administered to respondents (community locals, women and youth groups, head of households, community-based vigilante, etc) within the project corridors. The survey was designed to understand the socio-economic conditions within the project areas of influence.

The average percentage Gender Distribution for the sampled population across all 30 sheets is 74.4% (Male) and 25.6% (Female) respectively. The average percentage Age Distribution for all 30 sheets is 13.2% (18-24 years), 46.9% (25-34 years), 33.6% (35-64 years), 6.27% (65 years and above). The average percentage main occupation in all 30 sheets is 2% (Trading), 1.1% (Civil Service), 0.3% (Company Employment), 1.6% (Self-Employment), 1.5% (House Wife), 34% (lumbering and livestock farming), 8.5% (Artisanal and Small-scale Mining) and 51% of most communities engaged in farming (cultivation of crops such as maize, millet, groundnuts, vegetables and irrigation rice farming, etc). .Family sizes range from small (0-4 members), medium (5-7) to large (above 7) with average values of 16%, 43.3% and 40.4% respectively in all 30 sheets. Average annual income status of respondents for the 30 sheets are as follows: 12.67% earn N0-50,000, 46% earn N51, 000-N100,000, 35.6% earn N101,000 – 500,000 while 6.4% earn N500,000 and above. Malaria is a predominant sickness in the areas with an average of 79.4. other diseases include Typhoid 15.13%, Diarrhoea 1.33%, Cough 3.87% and other diseases 0.27%. Roads within and in the communities range from good to poor with average values of 19.87%, 50.9% and 27.47% respectively. Acceptability and project desirability are very high. Generally, respondents included community representatives, farmers, women groups and youth, fishermen, artisans, community-based vigilante, motorcycle riders (Okada), etc., located within and around 1st and 2nd order streams.

ES 5: Identified Potential Project Environmental and Social Impacts

	POSITIVE IMPACTS		
	ENVIRONMENTAL IMPACTS	SOCIAL IMPACTS	
✓	Waste Management ⁴ – The geochemical mapping phase will see to the implementation of a viable waste management plan which will promote the environmentally safe and sound final disposal of deposits including toxic mineral composites and unwanted materials exposed during sampling, especially soil and rock	Employment Generation – Short-term employment of skilled and unskilled labour will be promoted. Most unskilled labour will be local. Locals from the several Quadrants in each Sheet will be mainly contracted to serve as guides, spokespersons/interpreters and for labour in digging pits for soil sampling etc. This will help promote community goodwill.	
~	sampling. Metal Concentration Profiling - Complimentarily, the geochemical mapping	Livelihoods – This phase will encourage a little push-up of economic activities within and around communities located along 1 st and 2 nd order streams. Petty traders and food-spot owners will benefit from the demand of field sampling personnel.	
	could aide in the determination of metal concentrations and anomalies in soil, water and stream sediments. These metals which occur in the environment, could get-in through the food chain and pose human health risks.	Promote Organizational and Community Cohesion – The project will stimulate linkages and effective working relations between the MinDiver PIU, NGSA, Federal Mines Offices, Nigeria Security and Civil Defence Corps (NSCDC)/other security agencies or organizations, Federal Road Safety Corps (FRSC)	
√	Contaminated sites identified during the geochemical mapping could be considered for future interventions such as remediation by the Ministry of Mines and Steel Development	and Environmental Protection Agencies in the respective States where Sheets and Quadrants are located or cut-across.	

The project impacts are highlighted in Chapter 5 of this document. Nonetheless, the aspects considered when assessing the potential impacts of the Project are listed below:

³ A semi-structured questionnaire was prepared and administered to a minimum of six (6) respondents per quadrant (about 25 respondents per sheet). All administered questionnaire was retrived and analysed to estimate socioeconomic conditions within the project communities.

⁴ In geology, some minerals exist together with toxic and environmentally unsafe elements e.g. arsenic. During rock sampling there is a likelihood of target elements being separated from toxic elements which they form a compound with, in which case the sampling personnel will oversee and manage. Proper management, treatment and disposal of these non-target and/or toxic species (wastes) will be guaranteed during this mapping, hence this is seen as a positive impact.



POSITIVE IMPACTS	
ENVIRONMENTAL IMPACTS	SOCIAL IMPACTS
(MMSD). In addition, this will provide an opportunity for official reporting to the respective state Ministry of Environment or State Ministry in charge of solid minerals for possible follow up on the contaminated sites	It will also promote working cohesion (between the MMSD/NGSA and the environmental protection agencies) specifically in Best Environmental Practices (BEP) and Best Available Technologies (BAT) in waste management and general environmental protection within the project boundaries.
	Community Health & Safety – Community health and safety efforts will be intensified during the geochemical mapping phase as caution signs and hazard signs will be put up in work areas and locations to inform communities and others, about the on-going geochemical sampling activities and potential hazards.
	Occupational Health and Safety ⁵ – The phase will encourage the conduct of Occupational Health Risk Assessment (OHRA), Job Hazard Analysis (JHA), Hazard Communication Program (HAZCOM), OHS trainings and other proactive safety strategies (fulfilling the social and fiscal imperatives) which will help reduce the occurrence of on-site incidents/accidents and the resultant burden of direct or indirect compensation costs.

⁵ The Occupational Health and Safety (OHS) tools or proactive assessments stated will result in positive impacts directed at averting the occurrence of potential OHS incidents and accidents. If these are not put in place, OHS risks/hazards etc are more likely to happen. The preparation of these are beneficial in the sense that they collectively impact positively on OHS, especially as concerns the geochemical mapping.



Insert the Proposed Mitigation Measures for the Impacts Identified Above

	Potential Adverse Impacts	Mitigation Measures
Environmental	Water Quality – Sediment sample collection could agitate surface water and alter water quality in 1 st and 2 nd order streams, increase in turbidity, thus making them unfit for drinking ie. Water quality criteria such as Water Quality Index (WQI) may vary from the WHO and Standard Organization of Nigeria (SON) standards during and after the sampling exercise especially if contaminants are introduced.	 Limit sample collection to coarser stream beds to reduce the tendency of turbidity and agitation occurrence (<i>Refer to Annex 2</i> – NGSA Standard Sampling Procedures for Geochemical Mapping).
	Soil – Oil and chemical leakages from work vehicles, generators and equipment may lead to soil contamination and death of beneficial soil flora and fauna. Furthermore, soil sampling activities may have potential to worsen eroded areas especially when sampling may need to be carried out within a sampling area already affected by or vulnerable to erosion e.g. Murya (Sheet 231 Lafia), Egbla (Sheet 270 Oturkpo), Shaba (Sheet 208) and Tse Igyuve (Sheet 251 Makurdi). This is also likely where pre-existing ASM activities have contributed to soil erosion within project communities located around 1 st band 2 nd order streams e.g. Awo-akpali (Sheet 269).	 Provide stacking points for project equipment. Tighten loosed oil valves; Ensure regular checks and maintenance of vehicles and equipment; Turn off engines during non-work hours and ensure use of impermeable membrane to avoid direct contact of oil spillage with the soil. Limit soil sampling to areas that are not erosion prone (or erosion sites). Avoid soil sampling in ASM sites that have transformed to erosion sites.
	vehicles and generators would be generated during the geochemical mapping phase of the project. These are however envisaged to be minor and localized.	 Fuel switching Fuel switching non-high- to low-carbon content fuels (where available) Energy efficiency- Generators could be turned off when not in use Multiple trips reduction and subsequent reduction of carbon emissions. Hire vehicles, plants and equipment that are in good condition generally less than 3 years old.
	Air – Fugitive dust generation is envisaged especially during the geochemical mapping phase around earth roads under construction such as Ara – Karshi road which connects Karshi to Arabishi (Sheet 208 Keffi), Gimbi – Taraba Road which leads to project locations around Tungan Wada, Wase LGA (Sheet 192- Bashar) and along the Sabon Gida – Wuro Jam Road which is a major access road leading to most 1 st & 2 nd order streams in Wuro Jam (Sheet 234 – Bantaji).	 Reduce vehicle speed to 20-25km/hr on dusty roads. Ensure the use of appropriate PPE (nose masks)
	Noise – Noise disturbances from splitting/breaking of rocks using geological hammers during sampling. This could affect farming activities around some rocks. Noise impacts are expected to be minimal to moderate, short-term, reversible and site-specific and could exceed WHO/FMEnv permissible limits (90 db/70db). Notably, rock sampling around	- Provide ear muffs for affected persons.



	Potential Adverse Impacts	Mitigation Measures
	hamlets in proximity to 1 st and 2 nd order streams in most communities may predispose locals to noise during the sampling phase of the project.	
	Terrestrial/Aquatic Habitats – The sampling phase of the geochemical mapping activity may have minor short-term impacts on fauna and flora within the sampling areas, including disturbance of habitats and nesting grounds for rodents (fossorial organisms), reptiles and bird species during soil and rock sampling. The use of geological hammers to break down larger rocks into smaller pellets during rock sampling, may impact the natural habitats of endoliths as well as other organisms that live within rock crevices.	 As much as possible, rock breaking should not destroy the habitats. It is expected that after rock breaking, fauna which leave their shelter/nesting grounds temporarily, will return afterwards. Where possible, shallow pitting should be done within a reasonable distance from these habitats.
	Waste Generation – Littering of food waste by sampling Teams may contribute to waste generation.	 Provide black polyethylene waste bags for the collection and proper disposal of general wastes after each work day. Institute and implement waste management plan (WMP)
Social	 Noise – Noise may be generated as project vehicles move through communities and rural areas which are normally quiet. Also, during the operation of power generators to be used during the geochemical mapping activities. Additionally, splitting of larger rocks into smaller fragments using geological hammers may also constitute a nuisance within rural hamlets which are normally quiet. Risk of Illicit Behaviour and Crime – Risk of illicit behaviours such as vandalization of sampling equipment by locals, youths and hoodlums within the project communities. There may also be resistance from youths demanding cash settlements to allow the sampling teams access into certain project areas. Impacts to Physical Cultural Resources (PCR) - Trespassing by field sampling personnel for the geochemical mapping exercise may impact on Physical Cultural 	 Mitigation at Source Early notification. Do not conduct rock splitting activity (for sample collection) very early in the morning or late in the evening. Conduct follow-up consultations with community stakeholders to obtain a Social Licence to Operate (SLO) prior to sampling within any community. Adequate provision of security (NSCDC, NPF). Implement Physical Cultural Resource Management Plan (PCRMP), and Chance Find Procedures
	Resources and sacred areas in certain project locations such as katakpa in Wukari, Nkarasi 2 (Home to Monoliths), traditional forest at lyamite community (Obubra – Ugep 314 & Abakiliki 303). Specifically, trespassing might be viewed as a desecration of such sacred areas especially in places such as Nkarasi 2 where monoliths remain standing till date. Additionally, this could result in grievances and potential conflicts with those in charge of protecting such Physical Cultural Resources.	
	Grievances and Disruption of Activities - Grievances from community members, farmers and fishermen on the presence of field workers and project related activities or general misconceptions on the project. Grievances could also occur as a result of threading on sprouting crops when sampling teams access roads leading to 1 st and 2 nd order streams which are surrounded with farmlands. There may also be miscommunication and misinformation of community members about the geochemical mapping activities.	 Ensure early notification. Implement GRM Avoid sampling activities around sensitive areas. (E.g. Abandoned Borrow pits, Erosion prone areas, Farmlands, etc.)



Potential Adverse Impacts	Mitigation Measures
Labour Influx – Labour influx may lead to: Possible conflicts between Sampling Teams and interest groups in the communities who might share grievances as regards previous mining activities, techniques and sampling procedures applied; especially where this has caused pollution which affected their livelihood or leisure activities e.g. domestic water usage, fishing, farming, swimming etc. (more details are provided in chapter 5).	 Early notification of communities prior to kick-off of sampling activities Additionally, carry out sampling at spots that do not affect leisure fishing, farming and swimming etc Good work enforcement procedures; GRM; Conflict resolution.
Risk of social conflict between communities and the sampling personnel/workers resulting from operational, religious, cultural or ethnic differences, or based on competition for local resources (e.g., Canteen, boreholes, etc.). Increase in migrant workers/followers who in addition to the labour force, may migrate to the sampling locations, in view of rendering goods and services.	 Enforce and ensure proper orientation on acceptable behaviours for sampling team on/off-site. Ensure Code of conduct in Geochemical Mapping Consultant and workers contracts. Reduce labour influx by tapping into local workforce i.e. recruit locals as guides or for digging pits (shallow pitting) for soil collection, and for rock splitting activity during rock sample collection.
Insecurity – Workers may be predisposed to attacks by bandits and local hoodlums/thugs. This may be experienced during sampling in very remote rural communities prone to banditry and insurgencies. Some of these communities include boundary towns and LGAs such as Awe (Nasarawa), Akwana & Fiyayi (Taraba), etc. Increased risk of illicit behaviour and crime (such as theft of equipment and materials, and substance abuse) attributable to labour influx. Additionally, there may be increase in the risk of STIs, STDs, and unwanted pregnancies due to labour influx.	 Implement the security strategies stated in Annex 20 of this ESMP The MinDiver project security adviser to develop and implement a Security Management Plan in conjunction with the Ministry and security agencies including NSCDC, Police, Army etc.
Sexual Harassment (SH) and Sexual Exploitation and Abuse (SEA) - attributable to labour influx – Women and girls (within and outside the communities) may be exposed to sexual exploitation, abuse and harassment as a result of interactions with sampling personnel and possibly followers. Younger boys could also be at risk of SEA/SH. Sex workers may contribute to the spread or suffer contracting infectious diseases, STDs and STIs due to labour influx. There may also be the likelihood of them suffering sexual exploitation and abuse. (Note: there is also the possibility of contracting COVID-19). Violence Against Children (VAC) (Attributable to labour influx) – The increased opportunity for community members involved in some minor activities as unskilled labour, petty trading and services may attract child labourers and temporarily affect school attendance. Children may be exposed to various forms of violence from guardians and overbearing parents who may send them hawking to the sampling locations, especially when they show resistance.	 Ensure Code of conduct in Geochemical Mapping Consultant and workers contracts. Train sampling teams and organize workshops on SH and SEA for Geochemical Mapping Consultant. Align with MinDiver SH/SEA mitigation plan. VAC sensitization Campaign against child labour Regular stakeholders' meetings



	Potential Adverse Impacts	Mitigation Measures
	Community Health and Safety – accidents could occur from movement of vehicles and equipment to site, and transportation of samples to the laboratory. Risk of foot and legs being trapped in dug up pits which may be left uncovered after the sampling activity.	- Ensure to backfill all dug up pits after soil sample collection.
Occupational Health and Safety (OHS)	 Occupational Hazards – Accidents may occur due to excessive driving fatigue, stress, coordinative incoherence, driving at night, bad roads and prolonged road journey. Deep cuts, Bruises and Wounds from splitting larger rocks into smaller fragments during sampling. Personnel may be prone to kidnapping, banditry and violent attacks especially in areas prone to security threats (e.g., Ududu, Awe, Akwana, Fiyayi, etc.). Risk of falls: During sampling, it is likely for sampling personnel to be exposed to the risk of falling from heights around excavated pits. In the process of accessing 1st and 2nd order streams in Gungu in Gassol LGA and Gidan Adogo (Bantaji 234), Shinye (Ibi 233), sampling teams will need to cross the Benue River while being conveyed on ferries and canoes. This may predispose them to OHS risks such as overturns, boat collapses, etc., especially when the river is overflowing or tides are high during the rainy season. Trespassing into sacred areas may result to assaults of sampling personnel/team. 	 Implement OHS Management Plan (OHSMP) Allocate rest/break periods; Work rotation. OHS training and education; Use of PPE; Implement security strategies stated in Annex 20 of this ESMP Fill up and cover pits after sample collections. Install hazard signs. Conduct Job Hazard Analysis (JHA) Stakeholder engagement with communities (to know where not to trespass, and what is required if sampling must be done in these sacred areas) Implement PCRMP
	 Human-Wildlife Conflict Possible sighting and potential attacks by lions in Udegi Sheet 229. 	 Gather proper intel on areas where lion prides occupy Security personnel should be provided with tranquilizer guns (4 Nos) Ensure not to proceed with sampling activities without guides from the communities. Never leave the group.



ES 6: Environmental and Social Monitoring Programme and Costing

A singular ESMP matrix tablehas been prepared to cover all 30 Sheets. This is simply because i) One Consulting Firm will be procured and supervised by NGSA to conduct geochemical sampling for all 30 sheets and their respective Quadrants, ii) Almost all (85%) of the identified adverse Environmental and Social Impacts across the 30 Sheets are similar in nature and type and can be addressed predominantly by the same mitigation measures proffered. Nonetheless, where unique peculiarities exist in any of the sheets or are noteworthy, the ESMP has captured such. The ESMP also includes indicators, institutional arrangement, roles, responsibilities and an estimated budget. All the mitigation measures specified in the ESMP shall be included in the bid documents and contract documents for the successful enterprise or Consulting Firm to conduct the Geochemical Mapping. Details are documented under Chapter 6.

Capacity Building and Training

Capacity building measures will be required to ensure that institutions involved in implementing the various ESMP components have the necessary knowledge and skills to fulfil their roles.

Implementation Schedule

The activities related to environmental management and monitoring will be integrated in the overall field sampling campaign schedule. The geochemical mapping activity is expected to be completed within 12 months.

ES 7: ESMP Cost Estimates

The total estimated cost for the ESMP implementation and monitoring for all project locations is estimated at Two Hundred and Nine Thousand, Four Hundred and Eighty-Three US Dollars and Eight Cents, (**USD** 209,483.8). This is equivalent to Eighty-Two Million, Five Hundred and Thirty-Five Thousand, One Hundred and Three Naira Only (**NGN 82,535,103**)

Note: USD to Naira exchange rates as at September, 2022 (1 USD = 415 Naira) was applied and figures rounded up.

S/N	Item	Responsibility	Estimated Cost (NGN)	Estimated Cost (USD)
1.	Mitigation	Geochemical Mapping Consultant	40,567,080	97,752
2.	Monitoring	MinDiver PIU Safeguards; Respective SMEnv; SEPA; NGSA, NGOs, NPF/NSCDC, Public Health Workers, Department of Forestry, Wildlife and Fishery (Nasarawa State University), Community Liaison Officers, State Ministry of Youth Development and Women Affairs, etc.	14,346,650	34,571
		Sub-total	50,913,730	132,323
3.	Capacity Building	MinDiver PIU, Other relevant MDAs	23,300,000.00	56,145.3
		Sub-total	74,213,730	188,468.3
5.	Contingency	10% of Sub-Total	7,421,373	18,846.8
		TOTAL	82,535,103	209,483.8

The activities related to environmental and social risk management and monitoring will be integrated in the overall field sampling and analysis schedule. The ESMP mitigation costs will be included in the biding documents for the consulting firm, to enable the successful enterprise, implement intervention works consistent with environmental and social requirements of this ESMP document.



ESMP Disclosure

S/N	Action	Remarks
1	Disclosure on 2 National newspapers.	The PIU will disclose the ESMP as required by the Nigeria EIA public notice and review procedures
2	Disclosure on 2 state newspapers.	The PIU will disclose the ESMP as required by the Nigeria EIA public notice and review procedures
3	Disclosure at the MMSD and NGSA, Federal Ministry of Environment office and the State Ministry of Environment in all Project States	The PIU will disclose the ESMP as required by the Nigeria EIA public notice and review procedures
4	Disclosure at the MinDiver /MMSD office	The PIU will disclose the ESMP as required by the Nigeria EIA public notice and review procedures
5	Disclosure at the Local Government Offices in the affected states & local languages for the host community	The purpose will be to inform stakeholders about the project activities; environmental and social impacts anticipated and proposed environmental and social mitigation measures.
6	Disclosure on the World Bank external website or infoshop	The ESMP will be disclosed according to the World Bank Disclosure Policy- OP/BP 17.50

ES 8: Stakeholder Engagement

The consultation processes were conducted between 24th May – 30th June, 2022. In these consultations, special care was taken to ensure the appropriate participation of women and young people within the project areas and to understand and appreciate their views. Critical stakeholders identified and consulted included: i) MinDiver PIU; ii) MEC Officers iii) NGSA iv) Traditional Rulers of project communities v) District Heads vi) Community elders and locals of all project communities vii) Women Group viii) Youth Groups and ix) Other stakeholders within the boundaries of the project locations including women groups (locations for stakeholder engagement were majorly at the project communities). Several stakeholders were identified including farmers, stream users (nomadic herders, recreationists), motorcycle riders (Okada), community members, CBOs and NGOs. Vulnerable Groups were identified at the level of consultations. The criteria utilized was based on establishing members of the project area of influence likely to be at the most risk of the adverse impacts of the proposed intervention works. This is with regards to: (*i*) easy predisposition to SH and SEA, contracting STIs and STDs or unwanted pregnancies (social vulnerability); (*ii*) individuals likely to suffer damage of their food crops (physical and social vulnerability); (*iii*) people living with disabilities (physical vulnerability) (*iv*) elderly persons (social and probably, economic vulnerability) etc. In line with the criteria above, these include:

- Teenage and Adolescent Females: These, especially from communities where 1st and 2nd order streams are located or quite proximal to. They stand the risk of suffering SH, SEA, contracting STIs, STDs or unwanted and/or early pregnancies caused by migrant workers, especially at the pre- geochemical mapping and during geochemical mapping phases.
- Women and Children: These refer to or constitute female students, and family members who reside or
 offer petty trading services within project implementation sites. In the early stages of implementation and
 subsequently, they could be faced with the need to engage in activities such as petty trading and hawking,
 and may be harassed by impatient parents, partners, spouses or guardians. They may also be at risk to
 SH and SEA from Sampling personnel and Ad-hoc workers carrying out geochemical mapping activity
 around their areas of residence, schooling or petty trading.
- **Persons with Disabilities:** Negative impacts may be associated to restriction of movement and access to farms, fishing, cattle watering areas, ASM sites and recreational spots during the geochemical mapping phase especially for those living within the specific project corridors.
- Elderly Persons: This group of vulnerable people tend to be predominant across communities in all 120 quadrants (30 sheets), it's imperative to put them into cognisance, as they might easily be susceptible to adverse environmental and social impacts associated with the geochemical mapping e.g., ground trotting into and across their farms.



Summary of Key Consultation Concerns

While extensive details of stakeholder engagement are provided in Chapter 7 of this report, a brief summary on the outcome of the stakeholder engagement is presented below.

In general, the communities appreciated the idea of the proposed geochemical mapping project and expressed their optimism on its possible development to their communities. They assured the team of their full assistance and cooperation. A few concerns noted are presented below:

Concerns from Stakeholders	Response from ESMP Team
The community leaders enquired on the scheduled period when the ministry will embark on the proposed geochemical mapping activities.	The Consultant informed them that the scheduled period for the commencement of the geochemical mapping cannot be ascertained in the meantime; however, the mapping may likely kick start after the current E&S assessment is completed.
Some of the communities stated that people are already engaged in ASM while there are also some licensed companies engaged in mining activities	The Consultants explained that the geochemical mapping activity is not a mining activity; rather it is to further understand the type of mineral resources that may be present in the location for possibility of future development.
Most 1 st and 2 nd order streams are utilised majorly for domestic activities such as laundry, bathing, livelihoods activities such as fishing, source of water for farming and cattle watering	They were informed that while the activity will not involve the use of chemicals or substance that will cause pollution to the streams. The communities were assured that the geo-chemical sampling will be short term and is not envisaged to create any major issues for the farmers or those using the streams. The ESMP will outline measures to prevent pollution to the stream during sample collection such as proper waste management, measures to prevent conflicts through appropriate consultations. In addition, they will also be duly informed prior to the sample collection. Sampling personnel (consultant's staff and NGSA staff) will also be mandated to sign Code of Conducts against illicit behaviour, sexual
	harassment and abuse to help protect the community
They wanted to know if their youth can be engaged for the activity as some of them are not activey engaged in livelihood activities	the geochemical mapping team may engage some of their youths to support during sampling activities. However, the sampling is a short-term activity so engagement may be minimal.
The women usually make use of the streams in the communities for bathing, laundry, fetching water for house use.	They were assured that the women through the women leader and community leaders will be duly informed ahead of the sampling activity and sensitised to ensure that their privacy is not invaded. In addition, the workers will sign Code of Conducts against illicit behaviour, sexual harassment and abuse to help protect the community