



AFRICA
NATURE
INVESTORS

**REQUEST FOR QUOTATION (RFQ) FOR THE DESIGN, SUPPLY, INSTALLATION,
TESTING AND COMMISSIONING OF A POWER SUPPLY SYSTEM FOR A SURFACE
WATER ABSTRACTION & RETICULATION PROJECT
(ELECTRICAL WORKS)**

Project: GAO New Outpost

Client: Africa Nature Investors (ANI) Foundation

Location: Gashaka-Gumti National Park, Taraba State

Date: 04 May 2026

TABLE OF CONTENTS

1. Introduction and Purpose	3
2. Definitions and Interpretation	3
3. Employer’s Objectives and Key Design Requirements	4
4. Site Conditions and Project Constraints	6
5. Preliminaries and General Requirements	6
6. Scope of Works	7
6.1 Power Supply System for High Lift Centrifugal Pump	7
6.1.1 Solar Power System for High Lift Pump (Primary Power Source)	8
6.1.2 Diesel Generator for High Lift Pump (Secondary / Backup Power)	8
6.2 Power Transmission Line Across the River	9
6.3 Power Supply System for Camp Side Booster Pump	9
6.3.1 Solar Power System for Camp Side Booster Pump	10
6.4 Electrical Control, Protection, and Interlocks (All Systems)	10
6.5 Earthing, Lightning, and Surge Protection	11
6.6 Electrical Associated Civil Works	11
6.7 Testing, Commissioning, and Training	11
6.8 Monitoring and Instrumentation	12
7. Technical Standards and Performance Criteria	12
8. Materials, Equipment, and Quality Requirements	12
9. Programme, Methodology, and Risk Management	13
10. Pricing and Basis of Payment	14
10.1 Detailed Pricing Breakdown (Bill of Quantities Basis)	14
10.2 Pricing Responsibilities	15
10.3 Measurement and Payment	15
10.3.1 Payment Milestones	15
11. Submission Requirements	16
11.1 Technical Information	16
11.2 Commercial Information	16
11.3 Other Requirements	17



1. INTRODUCTION AND PURPOSE

Africa Nature Investors (ANI) Foundation invites qualified and experienced Electrical Contractors to undertake the **design, supply, installation, testing, and commissioning of complete electrical power supply systems**, including all associated civil and structural works required to support the installations for the proposed surface water supply scheme.

The scope of the works comprises the delivery of **two independent solar-based power systems**, each configured as a self-sustaining unit capable of reliably powering designated components of the water supply infrastructure. The systems shall incorporate solar photovoltaic generation, power conversion and control equipment, backup power arrangements, and complete electrical distribution, together with all necessary instrumentation, protection, earthing, and monitoring provisions.

The works shall further include all supporting civil and structural elements required for full system functionality, including equipment foundations, mounting structures, housing, and security provisions, as well as complete system integration, testing, commissioning, and handover.

The objective is to provide **robust, efficient, and low-maintenance electrical power solutions** capable of sustained operation within a remote and logistically challenging environment.

2. DEFINITIONS AND INTERPRETATION

Unless the context otherwise requires, the following definitions shall apply throughout this Request for Quotation:

- **“Employer” or “Client”** means Africa Nature Investors (ANI) Foundation.
- **“Contractor”** means the Electrical Contractor submitting a quotation and, if awarded, executing the Works.
- **“Works”** means the complete design, supply, installation, testing, commissioning, and handover of the electrical power systems described in this RFQ.
- **“Site”** means the Gao New Outpost and associated electrical installation locations within Gashaka-Gumti National Park, Taraba State.
- **“Permanent Works”** means all electrical, civil, and structural works forming part of the completed project.
- **“Temporary Works”** means all temporary installations required to execute the Works.
- **“Solar Power System”** includes PV modules, mounting structures, inverters, protection devices, cabling, and associated controls.
- **“Generator”** means the diesel-powered standby generating set and associated auxiliaries.



3. EMPLOYER'S OBJECTIVES AND KEY DESIGN REQUIREMENTS

Employer's Objectives

The Employer's key objectives for this project are to:

- Provide **reliable, autonomous, and low-maintenance electrical power systems** for critical water supply infrastructure.
- Achieve **long-term operational sustainability** using solar energy as the primary power source.
- Ensure **robust performance** under remote, environmentally exposed, and logistically constrained site conditions.
- Minimise operational complexity and dependence on frequent specialist interventions.
- Ensure personnel safety, equipment protection, and environmental responsibility.

Design Philosophy

The electrical works are intended to be **performance-based**, not prescriptive.

The Contractor is responsible for delivering systems that:

- Meet or exceed the required electrical loads and operational duty.
- Are resilient to voltage fluctuation, motor starting transients, and environmental exposure.
- Allow straightforward fault diagnosis and maintenance.
- Are capable of safe operation by locally trained personnel.

Key Design Requirements

- Independent power systems for:
 - High lift pump installation
 - Camp side booster pump installation
- Solar power as the primary energy source for both systems.
- Generator backup for the high lift pump and Camp power integration for the booster pump.
- **No battery storage system is required**, and none shall be designed or installed as part of the project.
- The power system shall be configured as a **solar photovoltaic (PV)-only system**, consisting of:
 - Solar PV modules, and
 - Appropriately rated inverters.
- Loads shall be supplied **directly from the PV array through the inverter** during periods of available solar generation.
- Stable system operation and controlled motor starting shall be achieved through:



- Correct inverter sizing and selection (including soft-start capability, VFDs, or adequate surge capacity, as required)
 - Sufficient PV array capacity to meet instantaneous load and starting current demands,
 - Appropriate electrical protection, control, and monitoring systems to manage voltage, frequency, and transient conditions.
- System operation shall be **limited to daylight and periods of adequate solar irradiance**.
- No **short-term or long-term energy autonomy** is required beyond real-time solar power availability.

Operating Profile (Indicative)

The Contractor shall base the system design on the following indicative operating assumptions (to be validated and optimised in design):

- **High Lift Pump:**
 - o Estimated operation: 8–10 hours per day
 - o Duty: Continuous during operation period
 - o Starting method: Contractor to propose (DOL / soft starter / VFD), with justification
- **Booster Pump:**
 - o Estimated operation: Intermittent / on-demand
 - o Typical daily runtime: 8–10 hours
- Systems shall be designed to operate independently, unless otherwise justified.
- The Contractor shall clearly state all assumptions used in final system sizing.

System Control Philosophy

The Contractor shall define and implement a clear control philosophy for each power system, including:

- Solar PV shall always operate as the primary power source
- Generator (where provided) shall operate as **secondary / backup source only**

For the high lift pump system:

- Generator operation shall be initiated based on insufficient solar generation

For the booster pump system:

- Integration with camp solar/generator shall include:
 - o Manual or automatic changeover
 - o Electrical and mechanical interlocking to prevent back-feeding

The Contractor shall provide:

- Control logic description
- Changeover philosophy
- Protection coordination



4. SITE CONDITIONS AND PROJECT CONSTRAINTS

Site Location and Access

- The project is located within **Gashaka-Gumti National Park**, a remote and environmentally sensitive area.
- Access routes are limited and may be seasonally constrained.
- The Contractor shall make full allowance for transport, mobilisation, and logistics.

Environmental Conditions

- High ambient temperatures, dust, rainfall, humidity, and wildlife exposure shall be assumed.
- Electrical equipment shall be rated and protected accordingly.
- Installations shall consider flood levels, erosion, and extreme weather events.

Operational Constraints

- Limited availability of grid power.
- Limited specialist technical support on site.
- Systems must be resilient, self-contained, and capable of operating without continuous supervision.

5. PRELIMINARIES AND GENERAL REQUIREMENTS

Contractor's Responsibilities

The Contractor shall be fully responsible for:

- Detailed design development.
- Procurement, supply, transport, and storage of all materials.
- All construction, installation, testing, and commissioning activities.
- Compliance with safety, environmental, and site regulations.
- Protection of completed works until handover.

Contractor is strongly encouraged to undertake a site visit prior to submission.

Health, Safety, and Environment (HSE)

- The Contractor shall submit and implement a project-specific HSE Plan.
- All works shall comply with applicable safety legislation and best practice.
- Special care shall be taken to protect the surrounding environment and wildlife.



6. SCOPE OF WORKS

The Contractor shall be responsible for the **complete design, supply, installation, construction, testing, and commissioning of the electrical power systems**, delivering fully functional and integrated installations in accordance with the requirements of this document.

The works shall comprise the provision of **two independent and self-contained power supply systems**, each designed to operate autonomously and serve its designated load. Each system shall include all electrical components, associated transmission lines, and the required civil and structural works necessary to ensure safe, reliable, and efficient operation.

The scope shall cover all aspects required for full system delivery, including detailed design development, procurement of equipment, transportation to site, installation, construction of transmission and distribution infrastructure, integration of system components, provision of protection and control systems, and execution of all supporting civil and structural works such as foundations, mounting structures, equipment housing, and security provisions.

The Contractor shall ensure that each system, including its associated transmission line, is delivered as a **complete, operable, and maintainable installation**, capable of sustained performance under the environmental and logistical conditions of the project location.

6.1 Power Supply System for High-Lift Centrifugal Pump (Dedicated System)

The Contractor shall provide a **dedicated electrical power supply system**, including all necessary civil works, to operate the **high-lift centrifugal pump** used for raw water transmission.

This power system shall be **independent of all other electrical systems**, except for the standby generator provisions defined below.

Scope Includes:

- Dedicated electrical power generation for the high-lift pump
- Motor power supply, control, and protection
- Electrical control panels, isolators, and safety devices
- Integration with level-based and operational interlocks (electrical scope only)
- All electrical-related civil works associated with this system

Design Basis (Indicative):

- Pump motor rating: **approximately 30 kW, three-phase**
- Continuous duty operation



- Allowance for high motor starting currents and transient loads

6.1.1 Solar Power System for High-Lift Pump (Primary Power Source)

A **stand-alone solar power system**, complete with its supporting civil works, shall be provided as the **primary power source for the high-lift centrifugal pump**.

Design Intent:

- The system shall be designed based on the **intended electrical load**, not a prescribed panel count or fixed configuration.
- The Contractor shall propose the **most suitable solar system architecture** to reliably operate the high-lift pump under site conditions.

Indicative Electrical Load:

- High-lift centrifugal pump motor: **~30 kW**
- Associated control panels and auxiliary electrical loads

Solar System Requirements:

- Solar PV array sized to reliably supply the above load
- Three-phase inverters suitable for:
 - High inrush current during pump start-up
 - Continuous heavy-duty operation
- System design to prioritise reliability, equipment protection, and maintainability
- **No Battery Required**

The Contractor is encouraged to propose a suitable system design that achieves the required power rating and lifecycle performance without the integration of any battery energy storage system.

Associated Civil Works (Included):

- Foundations and mounting structures for PV arrays
- Inverter and control panel plinths
- Equipment shelters, fencing, and basic access works where required

6.1.2 Diesel Generator for High-Lift Pump (Secondary / Backup Power)

A diesel generator shall be provided as a **standby power source** for the high-lift pump system, including all associated civil works.

Minimum Requirements:

- Generator rating: **60 kVA, three-phase** (or approved equivalent)
- Capable of starting and running the high-lift pump motor
- Weatherproof, sound-attenuated enclosure

- Electrical protection and control panel

Associated Civil Works (Included):

- Reinforced concrete generator plinth and foundations
- Generator fencing and basic weather protection

6.2 Power Transmission Line Across the River

The Contractor shall provide an **electrical power transmission line**, including civil and structural supports, from the high-lift power generation area to electrically powered equipment located on the opposite side of the river.

Scope Includes:

- Design and installation of an overhead or suspended river crossing
- Supply and installation of power cables, support structures, and anchors

Indicative Requirements:

- Cable type: **4-core × 24 mm² insulated armoured or heavy-duty cable**
- Approximate crossing length: **~160 m**
- Installed above maximum recorded or anticipated flood levels
- Mechanical anchoring, strain relief, and protection structures
- The Contractor shall determine and propose the **most suitable transmission voltage level (LV or stepped-up system)**, with full justification considering:
 - o Voltage drop
 - o Efficiency
 - o Installation cost
 - o Reliability
- Voltage drop calculations shall be submitted as part of the design.

6.3 Power Supply System for Camp-Side Booster Pump (Independent System)

The Contractor shall provide a **dedicated and independent electrical power supply system**, including all associated civil and structural works, for the camp-side booster pump serving the filtration system. The system shall operate independently of the high-lift pump power system and shall be designed for reliable and continuous operation.

Scope of Works Includes:

- Design, supply, installation, testing, and commissioning of a solar-based power system for the booster pump
- Complete motor power supply, control, and protection systems
- Provision of local isolator and control interface for safe operation and maintenance



- All associated electrical installations, cabling, and containment
- All required civil and structural works, including foundations, supports, and equipment housing

Generator Integration:

- Provision for connection to the camp generator power supply
- Supply and installation of appropriate changeover system (manual or automatic)
- Integration of necessary protection and control systems to ensure safe and seamless operation between power sources

Indicative Electrical Load:

- Booster pump motor rating: ~0.75 kW
- Associated control and auxiliary loads

The Contractor shall ensure the system is delivered as a **complete, safe, and maintainable installation**, fully integrated and suitable for long-term operation.

6.3.1 Solar Power System for Camp-Side Booster Pump

A **separate solar system**, complete with supporting civil works, shall be provided to power the camp-side booster pump.

Design Intent:

- System sized based on the intended booster pump electrical load ~0.75 kW
- Optimised for reliability, simplicity, and ease of maintenance
- No battery storage shall be required.

Camp Solar/Generator Integration:

- The system shall include provision for **connection to the camp power supply** via:
 - Manual or automatic changeover arrangement
 - Appropriate electrical protections and interlocks

Associated Civil Works:

- Panel mounting structures and foundations
- Inverter plinths
- Small equipment enclosures or kiosks

6.4 Electrical Control, Protection, and Interlocks (All Systems)

The Contractor shall provide all electrical control and protection systems necessary for safe operation of both power systems, including:

- Motor protection devices (overload, short circuit, phase failure)
- Inverter and generator protection systems
- Electrical interlocks based on tank level signals (interlocking only)

- Emergency stop facilities
- Local fault indication

6.5 Earthing, Lightning, and Surge Protection

A complete earthing and protection system shall be provided for **all electrical installations**, including:

- Earth electrodes at all major electrical equipment locations
- Common earth network interconnecting all systems
- Surge protection on DC and AC circuits
- Lightning protection appropriate to exposed installations

6.6 Electrical Associated Civil Works

All **civil and structural works directly related to the electrical installations** shall form part of the Contractor's scope, including but not limited to:

- Reinforced concrete plinths and foundations
- Equipment bases and supports
- Cable trenches, ducts, and backfilling
- Supports for overhead and surface-mounted cables
- Equipment fencing, minor access paths, and drainage around electrical installations

IMPORTANT NOTE:

The Employer shall have the right to select, approve, or nominate one or more qualified subcontractors to perform the civil and structural works associated with the electrical installations. The Contractor shall incorporate such subcontractor(s) into the Works without adjustment to the overall responsibility, risk allocation, programme, or warranties under the Contract.

6.7 Testing, Commissioning, and Training

The Electrical Contractor shall:

- Test all electrical systems under operational conditions
- Demonstrate operation under solar and generator power modes
- Verify motor currents, voltages, and protection settings
- Provide **on-site training** for designated ANI personnel



6.8 Monitoring and Instrumentation

The Contractor shall provide a basic monitoring system for all power installations, including:

- Inverter monitoring and data display
- Generator status indication
- Fault alarms and local indication

Where feasible, provision shall be made for:

- Remote monitoring capability (via GSM or equivalent communication system), subject to network availability

The system shall be simple, robust, and suitable for operation by locally trained personnel.

7. TECHNICAL STANDARDS AND PERFORMANCE CRITERIA

Applicable Standards

All works shall comply with, but not be limited to:

- Nigerian Electrical Codes and Regulations
- IEC standards (solar PV, inverters, batteries, protection devices)
- ISO standards for quality and environmental management
- Manufacturer's recommendations and best industry practice

Performance Criteria

- Systems shall operate continuously within rated capacity.
- Voltage regulation suitable for motor loads.
- Reliable motor starting under full load.
- Adequate redundancy and protective coordination.
- Systems shall achieve high solar contribution with minimal generator reliance
- Stable operation under motor starting conditions without system trips
- Acceptable voltage drops across transmission line within standard limit

8. MATERIALS, EQUIPMENT, AND QUALITY REQUIREMENTS

Materials and Equipment

- All materials shall be new, unused, and of proven quality.
- Equipment shall be from reputable manufacturers with technical support availability.
- Equipment ratings shall be suitable for continuous outdoor tropical conditions.
- Solar PV modules shall have minimum 20–25-year performance warranty
- All major equipment shall have manufacturer warranty and local or regional support where possible



Quality Assurance

- The Contractor shall operate a documented quality control system.
- Inspection and testing plans shall be submitted.
- All major components shall be tested prior to commissioning.

Warranty and Defects Liability

- The Contractor shall provide a minimum **Defects Liability Period of 12 months** from date of commissioning
- During this period, the Contractor shall:
 - o Rectify all defects at no additional cost
 - o Replace faulty equipment
- Extended manufacturer warranties shall be provided for key components:
 - o PV modules
 - o Inverters
 - o Generator

9. PROGRAMME, METHODOLOGY, AND RISK MANAGEMENT

Programme

- A preliminary programme shall be submitted showing:
 - o Design
 - o Procurement
 - o Installation
 - o Testing and commissioning
- Key milestones shall be clearly identified.
- The Contractor shall propose a realistic delivery timeline.
- Indicative target project duration: **to be proposed by Contractor** but shall reflect the remote nature of the site and logistics constraints.

Methodology

- Description of construction and installation approach.
- Logistics and access strategy.
- Strategy for working in a remote environment.

Risk Management

- Identification of key risks (technical, logistics, environmental).
- Proposed mitigation measures.
- Allowance for weather and access constraints.



10. PRICING AND BASIS OF PAYMENT

10.1 Detailed Pricing Breakdown (Bill of Quantities Basis)

- The Contractor shall submit a **fully detailed and itemised Bill of Quantities (BOQ)** covering all electrical works described in this RFQ.
- Pricing shall be **measurement-based**, with rates entered against each BOQ item.
- BOQ rates shall include, unless otherwise stated:
 - Design development
 - Supply and delivery to site
 - Installation and construction
 - All associated civil and structural works
 - Testing, commissioning, training, and handover
- The BOQ shall be sufficiently detailed to allow transparent commercial evaluation and future valuation of variations.
- The priced BOQ shall be deemed to include all works, materials, labour, plant, supervision, transport, temporary works, protection, and compliance with:
 - Specifications
 - Drawings
 - Applicable standards and regulations
 - Good electrical engineering practice
- No additional payment shall be made for any item, work, or service not expressly measured in the BOQ, but which is reasonably required for the safe, complete, and operable delivery of the electrical systems.

As a minimum, the BOQ shall be structured to clearly identify pricing for the following indicative categories:

- Mobilisation, preliminaries, site establishment, and demobilisation
- Detailed electrical design development and coordination
- Solar PV generation systems (modules, structures, DC systems)
- Inverters systems, and control panels
- Diesel generator supply, installation, and integration
- Power transmission lines, cabling, and terminations
- Motor control, protection systems, and electrical interlocks
- Earthing, lightning protection, and surge protection systems
- Electrical civil and structural works (plinths, foundations, trenches, supports)
- Environmental, Health & Safety (EHS) compliance measures
- Testing, commissioning, performance verification, and operator training
- Documentation, as-built drawings, and handover requirements
- Overheads, profit, and applicable taxes (if any), clearly identifiable within rates

10.2 Pricing Responsibilities

- The Contractor shall be deemed to have:
 - Examined the Site conditions
 - Understood the Scope of Works
 - Reviewed all information provided in the RFQ
- The Contractor shall allow in the BOQ for all conditions reasonably foreseeable at the Site, including access, logistics, environmental exposure, and operational constraints.
- Errors, omissions, or misinterpretations in the BOQ pricing shall **not** entitle the Contractor to additional payment.
- BOQ rates shall be **firm and fixed** for the duration of the Contract and shall not be subject to adjustment due to:
 - Changes in quantities
 - Construction methodology
 - Sequencing
 - Market price fluctuations
except where expressly provided for under the Contract as a formal
 - variation.

10.3 Measurement and Payment

- Payment shall be made based on **measured quantities of work executed**, valued using the **rates provided in the accepted BOQ**.
- Interim payments shall be certified based on:
 - Verified completion of measurable BOQ items, or
 - Agreed percentages of completed BOQ quantities.
- The Engineer shall be responsible for measurement, verification, and certification of completed works.
- The BOQ shall form the basis for:
 - Interim valuations
 - Variations
 - Final account assessment.

Payment Milestones

- Contractors shall submit a **proposed payment schedule** linked to measurable progress, such as:
 - Completion of design and approvals
 - Delivery of major electrical equipment to site
 - Installation of solar PV systems
 - Completion of power transmission works
 - Completion of generator installation and integration
 - Successful testing and commissioning
- Each milestone shall clearly reference the relevant BOQ items.
- Final payment shall be conditional upon:



- Successful commissioning of all electrical systems
- Submission of complete as-built documentation
- Formal acceptance of the Works by the Employer.

11. SUBMISSION REQUIREMENTS

Contractors shall submit a complete quotation covering all technical and commercial aspects of the Electrical Works. Submissions must be clear, detailed, and fully compliant with this Electrical RFQ.

All quotations shall be submitted electronically to: **ba@ani-nigeria.org**

Submission shall include:

Technical Information

- Company profile and relevant experience in electrical, solar PV, generator, and pumping infrastructure projects
- Proposed methodology and execution plan for design, supply, installation, testing, and commissioning of the electrical systems
- Design approach confirming compliance with the specifications, standards, and performance requirements stated in this RFQ
- Electrical single line diagrams and system architecture for each power system
- Datasheets for key electrical equipment including solar PV modules, inverter systems, diesel generator, motor control panels, protection devices, and cabling
- Project programme and delivery timeline indicating key milestones
- Risk assessment identifying technical, logistical, and environmental risks, with proposed mitigation measures
- Health, Safety, Environment (HSE) and quality control approach applicable to electrical works
- Detailed electrical load calculations and system sizing basis
- Voltage drops calculations for transmission system
- Control philosophy and system operation description
- Solar energy yield estimate justification

Commercial Information

- Total tender price derived from the priced Bill of Quantities (clearly stating currency)
- Fully completed and priced Bill of Quantities (BOQ), with rates entered against all items
- Cost summary by major electrical work components (power generation systems, transmission works, control systems, civil works, testing and commissioning)
- Proposed payment schedule linked to measurable progress and BOQ items
- Clearly stated assumptions and exclusions
- Quotation validity period (minimum 90 days)
- Warranty details for all major equipment

Other Requirements

- Confirmation that a site visit and detailed site assessment has been completed by the Contractor
- Compliance statement confirming adherence to the requirements of this Electrical RFQ, with any deviations clearly identified
- Confirmation that the Contractor has reviewed and understood the site conditions and project constraints
- Confirmation of compliance with **solar performance targets**.
- Submission format: one (1) signed electronic copy in PDF format