**TERMS OF REFERENCE**

**For carrying out drilling and associated (construction of drilling sites, rehabilitation,**

**and construction of temporary roads) works in the Kumtor Concession area in 2021.**

1. **General**
* Customer: Kumtor Gold Company CJSC (KGC)
* The work area is the Kumtor Concession area.
* The work area is located in Jety-Oguz district of Issyk-Kul Province. The northwestern flank of the concession area (approximately 40% of its area) falls on the Kumtor intermountain basin filled with coarse Quaternary sediments. The opposite south-eastern flank of the area extends to the high altitude (up to 5,000 m) axial part of Akshyirak Ridge. The nearest railway station, Balykchy, is 230 km away, and Bishkek is 410 km away.
* Works are substantiated by the Concession Agreement between the Government of the Kyrgyz Republic and Kumtor Gold Company CJSC dated June 6, 2009.
* Estimated volumes and types of work are presented in Table 1

|  |  |  |
| --- | --- | --- |
| 1.1 | Drilling of holes of HQ diameter, rm | 12,000 |
| 1.2 | Drilling of holes of PQ diameter, rm | 6,000 |
| 1.3 | Preparation of drilling sites, units. | 60 |
| 1.4 | Preparation of access roads to drilling sites, cub. m. | 110,000 |

Works comprise core drilling.

Period of work performance: from August 2021 to December 2021.

1. **Main parameters of work performance:**

Drilling operations.

* Core drilling of holes 200-900 meters deep. Drilling angles are between (dip) 40 and 90º. Drilling diameter (main) – HQ. When drilling through waste rock dumps, modern moraine and fracture zones, PQ diameter hole drilling is provided for up to a depth of 200 meters. It is possible to switch to NQ-diameter drilling by agreement with the Customer.
* Down hole survey is carried out every 25 meters.
* Core recovery should not be less than 76% for host rocks, and at least 90% for ore zones. The core is placed in boxes by drill advances. Each drill advance is tagged and recorded in the drilling log.
* Contractor is to re-drill failed holes with core recovery below 76% for host rocks and below 90% for ore zones at no extra cost.
* The Customer shall be provided with the entire core of the failed hole.
1. **Preliminary scope of drilling work:**

60 holes to be drilled totaling about **18,000 rm**. Average hole depth is 300 m.

1. **Construction and rehabilitation of roads, construction of drilling sites:**

***Rehabilitation of roads***. Restore destroyed sections of the existing road for the passage of trucks and vehicles;

***Road construction***. The roadway width of the temporary road over ground shall be not less than 3.5 meters on solid bed, and 6 m on ice. The highest possible longitudinal slope of the road is 7 degrees (12.3%).

The total length of roads is about 5,000 rm with the earthworks volume of 60,000 cubic meters.

***Construction of drilling sites***. The parameters of the drilling site must meet the drilling safety requirements and be close to standard-compliant 13x20 meters. Sixty drilling sites with the earthworks volume of 50,000 cubic meters.

**The total preliminary volume of** earthworks will be about**110,000 cubic meters.**

The scope of work is not fixed and can be changed depending on the result.

1. **Basic requirements for the performance of work:**
* The work must be carried out in strict compliance with current safety rules for geological exploration.
* Representatives of the Customer conduct inspections to ensure that drilling operations are carried out in accordance with the safety rules when conducting exploration work.
1. **Work quality requirements:**

All works must be carried out continuously during the entire period of drilling operations.

Drilling technology and technical capacity:

* Contractor must provide a detailed description of the drilling technology and core sampling procedures it plans to use at the Kumtor Mine.
* Clearing and preparation of sites for drilling is performed by the Contractor.
* The Contractor shall independently and at its own expense provide all necessary equipment, including drilling rigs, auxiliary equipment, spare parts, tools, consumables, and any other equipment necessary to perform the terms of the contract in the prescribed manner.
* The performance of equipment used should ensure that the planned amount of work is completed in the required timescale.
* Contractor must always have drill rods and tools on site for core drilling to a depth of 0 to 900 meters on each drill rig.
* All equipment must be plant-manufactured, the use of hand-made equipment is prohibited.
* Equipment must not be modified, factory assembly parameters should not be simplified during operation. Maintenance and use of equipment should be carried out in accordance with the manufacturer's recommendations.
* Equipment must be permanently serviceable and maintained in a technically sound condition.
* Water for drilling shall be delivered by the Contractor from water intakes specified by the Customer.
* The Contractor shall remove and discharge the used drilling mud on its own to places specified by the Customer.
* The Contractor is responsible for the timely and safe transportation of core boxes to the Customer's core handling and logging area.

#### **Daily Drilling Progress Report**

The Contractor must prepare a daily drilling progress report in respect of each hole. This report must include complete information on the Contractor's activities on each hole, as well as contain the following information:

* Full names of the drilling crew members;
* Hole ID;
* Hole diameter;
* Drilling progress (meters per shift);
* Detailed information on drilling equipment, including rod/tool losses;
* Downtime with a detailed description of reasons;
* Incidents, emergencies, and other safety issues;
* Other problems related to hole drilling and substandard operations.

All shift and daily drilling reports must be submitted to the Customer by 7.30 a.m. every day and signed by the representatives of both the Customer and the Contractor. The original document remains with the Customer, and a copy is given to the Contractor for presentation of invoices.

The representative of the Customer checks the shift reports for the data reliability, and to highlight controversial points, which should be corrected with the view to get the complete report data.

#### **Drill chart and measuring the hole depths.**

* The design hole position (drill hole collars marking and surveying) is determined by the Customer's surveyors.
* Before drilling holes, the Contractor shall carefully set up the drilling rig at the location of the hole specified by the Customer.
* The drill hole collar must be arranged within 1.0 meter of the specified drilling point.
* The representative of the Customer controls the location of all holes, and the representative of the Contractor at the site is responsible for the compliance of the actual location of drilling points with the designed ones.
* If it is necessary to relocate the hole, a new hole location must be approved in writing by the Customer.
* The control measurements of hole depths upon completion of drilling must be carried out in presence of the Customer representative and recorded in the daily reports.
1. **Environmental requirements**
* The Contractor shall conduct conformance inspections and agree to follow the policies of the Customer applied for all production processes performed at the drill site.
* These policies include environmental, health and safety policies, as well as policies for hiring of personnel.
* The contractor should line the bottom of the sump with a tight impermeable film to prevent drilling mud from seeping into the ground.
* Upon completion of hole drilling, the sump should be cleaned of sludge, the film removed from the bottom of the sump, and the sump should be buried.
* Drilling operations must be conducted in a responsible manner to protect the environment as far as it relates to spills of fuel and drilling mud.
* The Contractor is responsible for all possible spills. All major spill incidents must be reported to the representative of the Customer.
* Washing tanks or rinsing containers on unprotected ground is prohibited, as well as washing vehicles and equipment in water bodies in the drill site area.
* Upon completion of holes drilling activities and a drilling program, the Contractor will be required to conduct an inspection of each drilling site. The Contractor shall collect and remove the waste to the area agreed upon with the Customer to satisfy the Customer's requirements.
* It is forbidden to dispose of any waste at the drill site.
1. **Support for exploration work:**

In carrying out drilling operations, the Contractor shall undertake the following measures:

* The Contractor shall independently carry out mobilization/demobilization of equipment to the work site;
* The Contractor shall independently provide accommodation for the Contractor's personnel at the place of work;
* The Contractor shall provide food for the Contractor's personnel on a stand-alone basis;
* The Contractor shall independently provide and maintain a presence of a bath and laundry facility for the Contractor's personnel;
* The Contractor shall independently provide the personnel with transportation and other technical means;
* The Contractor is responsible for provision of water supply: pumping and delivery of technical water to the site, as well as drinking water to the base camp;
* The Contractor shall provide on-site transportation for carriage of the Contractor's personnel, delivery of fuel and lubricants, drilling equipment supplies and consumables, as well as delivery of packaged and labeled core to the core logging area;
* The Contractor shall carry out service and maintenance of the Contractor's machinery and equipment, as well as provision with necessary spare parts to perform the works;
* The Contractor shall ensure transportation of its personnel to and from the work place during equipment mobilization/demobilization or shift change;
* Contractor provides standard size core boxes, 1.5 meter long 3-section boxes for HQ diameter core; 2-section for PQ diameter core; 4-section for NQ diameter core;
* Fuel is provided by the Contractor.