

CONTRACT SPECIFICATIONS

SCOPE OF WORK

The Department of Environmental Protection (“Department”), Bureau of Abandoned Mine Reclamation, requires a Contractor to conduct a subsurface conventional air-rotary drilling project (“Project”) within the delineated Project areas as indicated on the Attachment to this agreement entitled, “Plan.” The work to be performed under this Contract will require non-percussion or percussion air-rotary drilling at a series of hole locations within the Work Area. Contractor shall furnish all labor, technical assistance, equipment, tools and material necessary to perform the contract tasks.

Contractor shall perform the following items of work:

1	Mobilization and Demobilization	1 EACH
2A	Drilling Exploratory Pilot Hole (minimum 4.5’)	340 L.F.
2B	Drilling Rotary Borehole to Accommodate 18” Sch 40 Steel Casing Pipe	30 L.F.
2C	Drilling Rotary Borehole to Accommodate 14” Sch 40 PVC Casing Pipe	120 L.F.
2D	Drilling Rotary Borehole to Accommodate Eight-Inch SDR17 PVC Casing Pipe	200 L.F.
3A	Furnishing and Installing 18” Sch 40 Steel Casing Pipe	30 L.F.
3B	Furnishing and Installing 14” Sch 40 PVC Casing Pipe, including Tremie-Grouting	120 L.F.
3C	Furnishing and Installing Eight-Inch SDR17 PVC Casing Pipe, including Tremie-Grouting	320 L.F.
4	Eight-Inch PVC Sealing Cap	2 EACH
5	Pilot Borehole Abandonment	1 EACH
6	Stand-by Time	1 HOUR

When requested by the Department, Contractor shall provide a completely mobilized rotary drilling rig on the Project site within 30 days of being notified to proceed.

Contractor shall mobilize the drilling rig to the work site together with all necessary supporting equipment and provide air or water for drilling. Contractor shall perform work at the Project site including drilling rotary boreholes using tri-cone or percussion rotary for the purpose of obtaining continuous rock chip samples of bedrock and determining fracture zones and voids. Contractor shall direct and handle drilling water at the surface and shall drill cuttings to prevent any unwanted offsite influence.

Contractor shall furnish and install 18” nominal Schedule 40 Steel overburden casing pipe. Contractor shall furnish and install tremie-grout 14” Schedule 40 and eight-inch SDR17 PVC casing pipe in two holes as designated by the Department Representative within the Project site work area. Contractor may drill, install and grout, the 14” PVC casing at the two hole locations prior to commencing the rotary drilling to accommodate eight-inch casing. Contractor shall use the 18” casing if needed to allow for drilling of the 14” casing through loose unconsolidated material.

Once all work at the Project site is completed, Contractor shall remove all equipment from the Project site. Contractor shall ensure that the restoration of the surface is to a condition equal to or better than that existing prior to the start of Project work.

Due to the nature of the work, Contractor may be required to modify the tasks at the Project site while the work is being conducted. Such modifications may include: 1) relocation of boreholes and 2) variation of the depth of the holes proposed for this Project.

Any modifications must receive prior approval and directed by the Department Representative.

Contractor shall furnish all necessary labor, material and equipment and perform all the required work and labor in an expeditious, substantial and workman-like manner as determined by the Department.

Any questions regarding the Specifications must be directed to Art Crossman at 814.248.8949. Any questions concerning the contracting or bidding process must be directed to Angela Vermeulin at 814.472.1808.

SPECIFICATION NO. 1: MOBILIZATION AND DEMOBILIZATION

1.1 SCOPE

The work covered by this Specification consists of the delivery to the Project area of all equipment, material and supplies, acquisition of any permits, removal from the site of all equipment after the completion of work, delivery of records, restoration of the site and final inspection by the Department.

1.2 PROCEDURE

Contractor shall perform mobilization activities including the furnishing and delivery to the Project area of all equipment, material and supplies, the complete assembly in satisfactory working order of all equipment used for the Project, and the satisfactory storage at the Project site of all such equipment, materials, and supplies. Moving between boreholes and set-ups at borehole locations included under this Contract will be incidental to the other appropriate pay items and no separate payment will be made.

Contractor shall perform demobilization activities including the removal of all equipment from the Project site, the clean-up of the Project site, and the restoration of any damaged

areas to as good or better condition than that which existed prior to its commencement of work.

All equipment and methods to be used by the Contractor are subject to written approval by the Department. However, approval of the equipment will not be construed as approval of the Contractor's methods or performance of the required work. Contractor shall furnish any additional or "special" equipment necessary to obtain the desired end results.

Contractor, at its expense, shall obtain all permits, of whatever nature, necessary for the completion of this work. Contractor shall comply with all existing laws, ordinances, rules and regulations relating to its operations. The Department or its designated representative shall obtain any Consents for Right of Entry from property owners.

Contractor shall make every effort to minimize damage incidental to access and the drilling operations. Contractor shall make maximum use of existing roads and lanes for access. Where it is necessary to deviate from roads and lanes, Contractor shall deviate by one track, at a location causing the least damage.

Contractor is liable to the property owners for any damage to vegetation, crops or property, irrespective of whether the damage was caused by its negligence or was an unavoidable consequence of drilling operations. The Department shall consult with property owners prior to moving equipment to the drilling location.

1.3 DELIVERY OF RECORDS

Contractor shall furnish the following records for the Project area within the following time constraints:

- A. Two typed electronic copies (PDF or similar format) of each borehole log, shall be submitted to the Department for review no later than 21 days after completion of all of the boreholes. Each borehole log must provide the following information:
 - 1. Borehole number;
 - 2. Borehole completion date;
 - 3. Depth of unconsolidated material (top of bedrock);
 - 4. Air loss or loss of returns;
 - 5. Rock types (description of cuttings);
 - 6. Measured void or caved and broken zone;
 - 7. Depth to each water bearing zone; and
 - 8. Linear feet, size, type of casing.
- B. Copies of any other records kept by the Contractor, which in the opinion of the Department Representative, will aid in the interpretation of the borings. The Department may request these records at any time during the course of the Contract.

No additional payment will be made for delivery of records, since delivery is included in Contract Item, "Mobilization and Demobilization."

1.4 MEASUREMENT AND PAYMENT

Contractor shall conduct measurements, payment for which will be made on the basis of a complete unit, but only to the extent directed and approved by the Department.

The Department shall pay Contractor at the Contract Lump Sum Price bid for "Mobilization and Demobilization," which price and payment constitutes full compensation for furnishing all labor, material, equipment, supplies and all necessary incidentals required to satisfactorily complete this item of work.

The Department will pay for mobilization in the amount of 40% of the unit price bid following complete mobilization at the work site.

The Department will pay for demobilization in the amount of 60% of the unit price bid following complete demobilization from the work site.

SPECIFICATION NO. 2: DRILLING ROTARY BOREHOLES

2.1 SCOPE

The work covered by this Specification consists of furnishing all labor, material, equipment, supplies and all necessary incidentals required to drill boreholes at this site location. Work will include drilling two exploratory pilot holes into the abandoned Lower Kittanning Coal Mine. The projected depth of each pilot hole is approximately 170 feet. Once the pilot hole has intersected suitable conditions at mine elevation, Contractor shall reamend this hole to accept final casing sizes. Contractor shall perform the following: drilling to accept 18" nominal Schedule 40 Steel casing pipe, if loose unconsolidated overburden conditions warrant the use of the steel casing to facilitate drilling the 14" overburden casing; drilling to 60 feet to accommodate 14" Schedule 40 PVC casing pipe; installing the casing pipe and grouting the annulus to within 15 feet of the surface; drilling to accommodate eight-inch SDR17 PVC casing pipe, installing the casing pipe and stage-grouting the annulus to surface through 100 feet of rock, mined coal beds conditions to within ten feet of the mine roof. Contractor shall submit a stage-grouting plan for approval prior to commencing grouting. Total depths of the boreholes are between 165 and 175 feet below ground level.

2.2 PROCEDURE

Contractor shall perform all work under the direction of the Department. Contractor shall drill rotary boreholes according to the Technical Specifications for the Project area.

The depth of the individual boreholes is an estimate. The termination depth of all boreholes will be at the discretion of the Department.

Contractor shall drill all boreholes with non-percussion or percussion air-rotary drills at locations shown on the Project Drawings or as designated by the Department. Contractor may churn drills for installing and handling casing pipe or reopening boreholes, if required.

The Department shall designate the location and order of drilling of the holes. Contractor shall determine the location of all underground and overhead utilities such as, but not limited to telephone, cable, sewer, gas, water, and electric. Should the location of any utility prohibit the drilling of any borehole, Contractor shall advise the Department for possible relocation of said borehole. Contractor will not be paid for any borehole or part of any borehole that should punctures a utility.

Contractor shall equip rotary drills with complete dust control systems or mechanisms to collect dust produced in the process of drilling and prevent the discharge of dust into the atmosphere. The dust control systems will be of ample capacity to serve under all conditions. Drilling rigs will be of sufficient size and capacity to carry on drilling operations in an efficient manner.

Contractor shall drill plumb and stable boreholes. Contractor shall attach a stabilizer, not less than ten feet in length and one inch less in diameter than the diameter of the bit, to the cutting bit and stem.

Contractor shall drill boreholes through the rock strata with a drill bit sufficient in diameter to accommodate the specified borehole-casing pipe with a minimum 3.62 inches of annulus space for tremie-grout sealing to the requested target depth.

When an opening in a coal bed or other void is encountered, Contractor shall probe the opening or void to determine its depth and condition. Payment for such probing will be as drilling at the specified diameter and at the same price per linear foot listed in the Contract Unit Price.

Contractor shall keep and furnish to the Department Representative an accurate log of the completed boreholes, which must include, but is not limited to: the type and condition of the unconsolidated overburden (wash), rock strata and coal beds. A more detailed description of the information required for each borehole log is outlined in Contract Item, "Mobilization and Demobilization," Section 1.3 Delivery of Records.

In the event the walls of the boreholes begin to cave or barrel, Contractor shall either introduce Sodium Bentonite into the borehole or attempt any other method the Contractor deems suitable to stabilize the borehole wall, providing it meets with the prior approval of the Department Representative.

Contractor shall reopen or replace any borehole that may be lost or become unusable at its own expense. Contractor shall seal any borehole that is lost or becomes unusable at its own expense.

If additional boreholes are necessary, in the opinion of the Department, Contractor shall drill the additional boreholes at the price per linear foot listed in the Contract for similar size boreholes.

2.3 MEASUREMENT AND PAYMENT

Contractor shall perform measurements, when accepted and approved by the Department, for non-percussion or percussion rotary drilling of the diameter specified based on the

linear feet of holes drilled and accepted by the Department, but only to the extent directed by the Department.

Payment will be made at the Contract Unit Price bid per linear foot for Contract Items, 2A) Drilling Exploratory Pilot Hole (minimum 4.5”), 2B) Drilling Rotary Borehole to Accommodate 18” Sch 40 Steel Casing Pipe, 2C) Drilling Rotary Borehole to Accommodate 14” Sch 40 PVC Casing Pipe, 2D) Drilling Rotary Borehole to Accommodate Eight-Inch SDR17 PVC Casing Pipe (with minimum 3.62” annulus, which price and payment will constitute full compensation for furnishing all labor, material, equipment, supplies and all necessary incidentals required to satisfactorily complete this item of work.)

SPECIFICATION NO. 3: FURNISHING AND INSTALLING CASING PIPE

3.1 SCOPE

The work covered by this Specification consists of providing all labor, material, equipment and incidentals required to furnish and install 18” Schedule 40 Steel casing pipe. Contractor shall furnish and install tremie-grout 14” Schedule 40 PVC casing pipe and eight-inch SDR17 PVC casing pipe into the boreholes.

3.2 PROCEDURE

Contractor shall furnish and install new Schedule 40 Steel and PVC well casing pipe in all boreholes, which will be used for dewatering and monitoring purposes of a Designated Dangerous Impound. The Department Representative shall specify casing pipe size and type and shall approve all casing pipe before it is installed in the boreholes.

- A. Contractor shall install 18” nominal diameter Schedule 40 Steel casing pipe to 15 feet below ground level (BGL).
- B. Contractor shall install 14” diameter Schedule 40 PVC casing pipe to 60 feet below ground level (BGL). Contractor shall grout the annulus from the bottom to within 15 feet of ground level.
- C. Contractor shall install and securely anchor eight-inch diameter SDR17 PVC casing pipe in the boreholes from the surface to the designated depth. The annulus space must be stage grouted from the bottom of the casing to the ground surface (see Figure 2). Contractor shall submit a grouting plan for Department review and approval prior to starting the grouting process.

Contractor’s cost of grouting and of making a watertight seal will be incidental and included in the price per linear foot for the specified diameter borehole casing pipe as listed in the Contract Unit Price.

3.3 MEASUREMENT AND PAYMENT

Measurement for casing pipe, when directed and approved by the Department, will be made based on the linear feet of casing pipe of the diameter and type specified, furnished and installed.

The Department shall pay Contractor at the Contract Unit Price bid per linear foot for Contract Item, “3A Furnishing and Installing 18” Sch 40 Steel Casing Pipe,” “3B Furnishing and Installing 14” Sch 40 PVC Casing Pipe, including Tremie-Grouting,” “3C Furnishing and Installing Eight-Inch SDR17 PVC Casing Pipe, including Tremie-Grouting,” which price and payment will constitute full compensation for furnishing all labor, material, equipment, supplies and all necessary incidentals required to satisfactorily complete this item of work.

SPECIFICATION NO. 4: EIGHT-INCH PVC SEALING CAP

4.1 SCOPE

The work covered by this Specification consists of providing all labor, material, equipment and incidentals required to furnish and install eight-inch PVC sealing cap.

4.2 PROCEDURE

Contractor shall furnish and install new eight-inch PVC sealing cap, which must be secured and also must be removable.

4.3 MEASUREMENT AND PAYMENT

Measurement, when accepted and approved, for sealing cap will be made based on each sealing cap installed, but only to the extent directed by the Department.

The Department shall make payment to Contractor at the Contract Unit Price bid per each sealing cap for Contract Item, “Eight-Inch PVC Sealing Cap,” which price and payment shall constitute full compensation for furnishing all labor, material, equipment, supplies and all necessary incidentals required to satisfactorily complete this item of work.

SPECIFICATION NO. 5: PILOT BOREHOLE ABANDONMENT

5.1 SCOPE

The work covered by this Specification consists of furnishing all labor, material, equipment, supplies and all necessary incidentals required to satisfactorily seal unsuitable boreholes as defined under this work item.

5.2 **PROCEDURE**

If a borehole is considered unsuitable for future monitoring use as determined by the Department Representative, Contractor shall seal each borehole in the following manner:

- A. Upon completion of the borehole and acceptance by the Department Representative, Contractor shall insert a plug of its choice, which is acceptable to the Department Representative, in the borehole a minimum of ten feet above the Lower Kittanning Coal seam or to a point selected by the Department Representative. In the event that significant quantities of water are encountered, the Department may require Contractor to set the plug below the aquifer and build the seal from that elevation.
- B. Contractor shall inject cement concrete into the plug until the injected cement concrete comes to the surface. Contractor may use additives or accelerants to reduce the cement concrete set-time when approved in advance by the Department Representative.
- C. Contractor shall stem the hole within one foot of the surface with sand, gravel, 2B stone or drill cuttings.
- D. Contractor shall restore the surface to as good as or better than original condition.

Except with the permission of the Department Representative, Contractor shall not abandon nor complete any borehole, or remove any casing or drilling equipment, without first affording the Department Representative the opportunity to obtain the position and the depth of the borehole to abandonment or completion and any other information which the Department Representative may require. No payment will be made for any borehole which has been abandoned by the Contractor before reaching the depth, elevation or condition specified, and no payment will be made for the sealing of the borehole in accordance with the specifications, unless the Department Representative approves the borehole as being completed. The Department Representative may, at its option, accept a borehole which fails to reach the required depth due to unusual subsurface conditions which, in its opinion, could not reasonably have been anticipated.

5.3 **MEASUREMENT AND PAYMENT**

The item, "Pilot Borehole Abandonment," when accepted and approved for sealing boreholes, will be made on the basis of each borehole abandoned, but only to the extent directed and accepted by the Department Representative.

This item, "Pilot Borehole Abandonment," will be paid for at the Contract Unit Price bid per each. The price and payment will constitute full compensation for furnishing all labor, material, equipment, supplies and all necessary incidentals required to satisfactorily complete this item of work.

SPECIFICATION NO. 6: STAND-BY TIME

6.1 SCOPE

The work item covered by this Specification addresses any delays in drilling in which a drill rig and crew is ordered by the Department to stand idle.

6.2 PROCEDURE

When the Contractor is ordered by the Department to delay the drilling of any borehole, the Department shall reimburse the Contractor for any such delays providing the delays are the sole responsibility of the Department, and the delays are more than one-half hour in duration.

The Department may not use stand-by time for payment to the Contractor for delays caused by equipment breakdown and malfunctions or for delays caused by non-availability of necessary equipment and supplies. Contractor is responsible for these delays that are incidental to other items of work for which no additional compensation will be allowed. The Department shall not pay Contractor for any payment for stand-by time for items of equipment other than complete drill rig and crew in full operating condition.

Contractor shall ensure that a crew consists of a driller and helper. If any delay does occur, the Department shall record it daily with dates and times directed to be idle.

6.3 MEASUREMENT AND PAYMENT

Measurement, when accepted and approved, will be made on the basis of hours a drill rig and crew is ordered to stand idle, but only to the extent directed by the Department.

The Department shall make payment to Contractor at the Contract Unit Price bid per Hour for "Stand-by Time" and will be divided no finer than one-half hour increments, which price and payment constitutes full compensation for the delay of a drill rig and crew.

SPECIFICATION NO. 7: INSPECTIONS

Contractor shall furnish ample opportunity at all times to the Department Representative for inspecting the work. If any imperfect work is performed at any time, Contractor shall remedy the defects, at its expense, to the full satisfaction of the Department Representative. Contractor shall not perform any drilling, set-up, restoration, or field testing except in the presence of the inspector or Department Representative, unless specific permission has been granted to the contrary. The presence of an inspector, or the keeping of separate drilling records by the Department Representative, does not relieve the Contractor of the responsibility for work specified in the Contract.