

APPENDIX E

SPECIFICATION FOR GEOPHYSICAL LOGGING

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. The work to be performed under this Appendix includes the furnishing of all labor, materials, equipment, and all other facilities and incidentals necessary to geophysically log the borehole for the bedrock monitoring well. The following logs shall be run: spontaneous potential, 16-inch normal resistivity, 64-inch normal resistivity, and natural gamma radiation.
- B. This Appendix describes the geophysical logs to be run by a firm retained by the CONTRACTOR and approved by the ENGINEER. Geophysical logs will be run upon the completion of the bedrock borehole, but before installation of the monitoring well in the borehole.

1.02 SUBMITTALS

- A. CONTRACTOR shall submit the name and qualifications of the firm proposed to conduct the geophysical logs to the Engineer within 5 days of the Notice of Proceed.
- B. CONTRACTOR shall submit three field copies of the logs to the ENGINEER immediately after the logs are run. The CONTRACTOR shall submit five final copies of each log, one reproducible original and one floppy disk of the log at no additional cost within one week of completing the geophysical logging in the field.

1.03 MEASUREMENT AND PAYMENT

- A. Payment for the geophysical logs will be based on the lump sum bid for the item. Payment shall include full compensation for fluid circulation, removal of drill string, operation of the drilling rig and other equipment, furnishing and operating geophysical logging equipment as specified, and providing whatever assistance may be required to accomplish the geophysical logging.
- B. There will be no additional payment for rig time or idle time while geophysical logging is conducted. No standby time will be paid for the 24-hour period after the logs are run while the ENGINEER and OWNER interpret the logs.

PART 2 PRODUCTS

2.01 GEOPHYSICAL LOG

- A. The geophysical log shall consist of a spontaneous potential, 16-inch normal resistivity, 64-inch normal resistivity, and natural gamma radiation, unless otherwise specified by the ENGINEER. The horizontal scale for the plot of the spontaneous potential shall be 20 millivolts per inch, or as approved by the ENGINEER. The horizontal scale for the plot of the 16-inch normal, 64-inch normal, and point resistivity shall be 40 ohm-meter per inch, or as approved by the ENGINEER. The vertical scale for all logs shall be 10 feet per inch. The vertical adjustment

required to determine the true depth for each of the geophysical log curves shall be indicated on the plot. The logs shall be run on digital equipment with a minimum of one data point per vertical foot recorded. The data format should be ASCII provided on a 3-inch disk or as approved by ENGINEER. All equipment shall be properly calibrated and in good working order; evidence of calibration will be provided as requested by the ENGINEER.

PART 3 EXECUTION

3.01 WELL LOGGING

- A. Upon completion of drilling the borehole, the geophysical log shall be run. Before running geophysical logs, the CONTRACTOR shall cease drilling and circulate fluid for not less than 1 hour.
- B. Calibrate all geophysical logging instruments prior to and after completion of the log.
- C. The geophysical logs shall become the property of the ENGINEER at the time the logging is completed. The logs will be run in the presence of the ENGINEER. The CONTRACTOR shall provide three field copies of the logs to the ENGINEER for interpretation immediately upon completion. The geophysical logging firm shall provide the ENGINEER with five final copies of each log, one reproducible original, and one floppy disk of each log at no additional cost within 1 week of completing the field work.
- D. The logging speed for all logs shall not exceed 40 feet per minute, unless otherwise approved by the ENGINEER.
- E. The CONTRACTOR shall be required to provide whatever assistance may be necessary to accomplish the geophysical logs.
- F. The CONTRACTOR shall perform necessary measures after the geophysical logs are run to insure the stability and preservation of the borehole until the monitoring well has been completed.
- G. Any log that is not usable or is inaccurate because of equipment failure, reproduction quality or individual error shall be relogged at no additional expense to the OWNER.

3.02 LOSS OF TOOLS

- A. The CONTRACTOR shall take full responsibility for logging of the wells.
- B. The CONTRACTOR shall take full responsibility for the condition of the hole during and after logging. The CONTRACTOR shall hold harmless the OWNER and ENGINEER for loss of tools and collapse.
- C. The CONTRACTOR shall receive no payment for time and material for removal of lost tools and equipment and no compensation for replacement of equipment or loss of time.

- D. The OWNER may withhold a portion of payment due in order to compensate the ENGINEER for the additional cost of inspection associated with loss of tools and subsequent hole conditioning.

END OF APPENDIX E