Attachment 2

Temporary Permit for Groundwater Monitoring
Well Inspection and Groundwater Monitoring Plan

Well Monitoring and Sampling Activities and Protocols

This Well Inspection and Groundwater Monitoring Plan describes the proposed well inspection, groundwater monitoring, and sampling activities and protocols to be conducted at wells participating in the water level monitoring program related to the Klamath River Renewal Project.

Well Inspection

Prior to commencing water level monitoring activities, AECOM (or its sub-contractor), as technical representative for the Klamath River Renewal Corporation, will visit with each well owner to obtain critical well information such as: well depth, screen interval, current depth to water, well casing size, pump size, and any historical well issues such as water quality and quantity. AECOM will then conduct a well inspection to determine access to the wellhead, location and size of measurement and sampling ports, logistics for placement of long-term water level measurement equipment, and well security.

During the well inspection, AECOM will also collect an initial water level measurement in the well to determine the depth placement for the long-term water level measurement equipment. The initial water level will be measured using a standard water level meter that consists of a stainless-steel water level probe attached to a tape measure with marked intervals of 0.01 foot, such as the Solinst 101 P7 Water Level Meter, or equivalent. If possible, the well pump should be turned off prior to water level measurement. The probe and tape will be cleaned with biodegradable soap and potable water immediately before use and phthalate-free gloves will be used during water level measurement to ensure sanitary conditions.

The well cap or measurement port will be opened and the surveyor's reference point will be recorded. If the well has not been surveyed or no reference point is visible, one will be established and recorded. The probe will be lowered into the well until an audible tone and light indicates that the probe has made contact with water. The tape measure will be held against the reference point and the water level depth recorded at the reference point. The probe will then be lowered until the bottom of the well is reached and the total depth of the well will be recorded at the reference point. The probe will then be removed from the well and the well cap replaced. The initial water level will be collected in accordance with the following standard procedures included in Attachment 3:

- California Department of Water Resources Groundwater Elevation Monitoring Guidelines, December 2010
- U.S. Environmental Protection Agency (EPA) Standard Operating Procedure (SOP) No 2043, Groundwater Level Measurement, May 2013

Well Monitoring

Long-term water levels will be monitored for a minimum of one year prior to dam removal, during reservoir drawdown, and for a minimum of one year following dam removal. Long-term water levels will be monitored using a standard pressure transducer such as the Solinst Model 3001 Levellogger, or equivalent. Prior to deploying the transducer in the well, AECOM will program the unit and determine the deployment depth based on the static water level and pump location. The pressure transducer will be cleaned with biodegradable soap and rinsed with potable water immediately prior to installation and phthalate-free gloves will be used during deployment and removal of the pressure transducer to ensure sanitary conditions.

The well cap will be opened and the probe and cable lowered to the pre-determined depth using a wireline. The transducer shall not be set near the bottom of the well. The unit will be secured at the surface with the wireline and the well cap will be replaced. Upon completion of the monitoring program, the transducer will be removed from the well. The pressure transducer will be deployed and operated in accordance with the following standard procedures included in Attachment 3:

- California Department of Water Resources Groundwater Elevation Monitoring Guidelines, December 2010
- U.S. EPA SOP No. 2073, Submersible Pressure Transducers, May 2015

AECOM will inspect the transducer and download data to a handheld device on a monthly basis. AECOM may collect water level data remotely using a telemetry system that uses wireless cellular technology connected to a central database or collected with a Bluetooth device in the general proximity of the well.

Groundwater Quality Sampling

AECOM will collect groundwater samples from the well before and after placement of the pressure transducer. An initial water sample will be collected prior to monitoring activities to determine baseline water quality in the well. A second sample will be collected after transducer installation for comparison with the initial sample results to confirm that the well water quality has not been compromised. If available, groundwater samples will be collected from a tap or spigot located near the well head prior to any treatment system.

If sampling from a tap or spigot, the system will be purged (i.e. water will be run) for 15 minutes to avoid sampling stagnant water. After the purge period, sample containers will be filled directly from the tap. Phthalate-free gloves will be worn when handling samples to ensure sanitary conditions.

If sampling from a tap is not possible, then a pre-cleaned stainless steel or sterilized polyethylene disposable bailer will be used to collect the sample. At least one well volume will be removed with the bailer to avoid sampling stagnant water. The well cap will be opened and the bailer lowered below the water level with a secure wireline or rope. Once the bailer has filled with water, it will be raised to the surface. Sample containers will be filled directly from the bailer. The well cap will be replaced upon completion of sampling activities.

Groundwater samples will be placed in ziplock bags and placed on ice in a cooler. The sample cooler will be secured and transported to the laboratory along with a completed chain of custody form. Groundwater samples will be collected, packed, and shipped in accordance with the following standard procedures included in Attachment 3:

- U.S. EPA SOP No. 305, Potable Well Sampling, May 2013
- U.S. EPA SOP No. 2003, Sample Packing and Shipping, June 2015

Laboratory analyses will be consistent with the California State Water Resources Control Board's list of chemicals and elements monitored for potable water supplies. Samples will be sent for analysis at a California Environmental Laboratory Accreditation Program (ELAP) certified laboratory. Acceptable results are those that meet California Drinking Water Standards (SWRCB 2018).

References

California Department of Water Resources (DWR). 2010. Groundwater Elevation Guidelines. December.

California State Water Resources Control Board (SWRCB). 2018. Maximum Contaminant Levels for Regulated Drinking Water Contaminants. January 10.

Federal Energy Regulatory Commission (FERC). 2010. Klamath Hydroelectric Settlement Agreement. Amended March 15, 2016.

Klamath River Renewal Corporation (KRRC). 2018. Definite Plan for the Lower Klamath Project. June.