LS Power Grid California, LLC

Data Request #4

5/23/25

RE: DR-10: Alternative 230kV Submarine Segment - Partial HDD Installation

Horizontal Directional Drilling:

Horizontal Directional Drilling (HDD) is a boring technique that may be used to complete the proposed LSPGC 230 kV Submarine Segment's approach to the utility vault located on the southern and northern shore of the Sacramento River. HDD involves drilling along a horizontal arc that would pass beneath the resource or infrastructure to be avoided. The HDD technology uses a hydraulically powered horizontal drilling rig supported by a drilling mud tank and a power unit for the hydraulic pumps and mud pumps. A variable-angle drilling unit would initially be adjusted to the proper design angle for the drill. LSPGC has reviewed the maximum extent of distance from the shoreline that the HDD could reach and has determined that distances of up to 1,500 feet waterward are feasible. The first step would be to drill a pilot hole. The first and smallest of the cutting heads would begin the pilot hole at the surveyed entry point in the entry pit. Once the pilot hole is completed, a succession of larger cutting heads and reamers would be pulled and pushed through the bore hole until it is the appropriate size for the cable. Once the drill hole reaches the correct diameter, a high-density polyethylene (HDPE) casing would be installed to keep the bore hole open for the cable installation. A workspace for the length of the HDPE casing would be required for both shorelines. The HDPE may be floated into the riverway and pulled from the river to the shoreline. Then a pulling head would be attached to the end of the cable section, and the cable would be pulled through the drill hole until it surfaces on the other side. Once the cable was installed, the space between the HDPE casing and the cable would be backfilled with thermal grout using a tremie pipe. The completed, drilled crossing would then be connected, as appropriate, and the entry and exit pits would be backfilled

Drilling Fluids:

Drilling fluid containing water, bentonite clay, and additives (referred to as "drilling mud") would be used to aid the drilling, coat the walls of the bore hole, and maintain the opening. During the bore, drilling fluid would be pumped under high pressure through the drill stem to the rotating cutting head and would return the soil cuttings to a pit at the surface entry point. No additives that are considered hazardous, according to federal and state laws, would be used during the HDD process. In water, the exit location would consist of a gravity cell method to contain fluids. A gravity cell is a trench box that is submerged in the riverbed where

the drills exit location will be. Dredging would be required to excavate the gravity cell, which would cause sediments to become dispersed within the water column and may cause impacts on water quality and aquatic resources. Since the drilling fluid is heavier than water it will naturally settle into the gravity cell and can be pumped out to the support barge. These fluid containment locations would be monitored full time from barges and support vessels to ensure the drilling fluid is contained and removed properly. The drilling fluid would be received at borehole entry and exit points in a gravity cell measuring approximately 125 feet by 25 feet. Fluids at the gravity cell may become dispersed within the river column, creating impacts on water quality and aquatic resources. The drilling mud would be pumped out of the apparatus and stored on a barge until it can be properly disposed of. The drilling fluid would be filtered/cleaned, conditioned, and reused to the extent feasible. Excess drilling fluid is anticipated to be hauled off site after construction for disposal at an approved facility. If a frac-out occurs, the boring operation would be assessed to determine whether the bentonite needs to be contained.

Once the bore hole is installed and ready, the jet sled, with the submarine cable, would be positioned outside of the gravity cell. The submarine cable would then be attached to a shore mounted winch line which would pull the submarine cable through the HDPE casing in the bore hole. Once the submarine cable is on shore and anchored to the shoreline, the jet sled begins installation across the river. A similar approach would occur on the northern side of the river.

Timing:

The use of HDD would require LSPGC to install six submarine transmission cables, rather than the proposed four submarine transmission cables, due to ampacity issues arising from the deeper installation of an HDD. Due to the additional cables, and addition of installing bore holes, two seasons of the in-river work window (July 1 to October 31), would be required to install all cables. Currently, the Proposed Project fits within one season's in-river work window; however, there is no float to accommodate the additional time to install the HDD bore holes, pulling cable on shore, and installing an additional two cables. This process would take two full seasons to install, without any room for contingency. The first season would be used to install the six bore holes on the north and south shorelines. The second season would be used to hydroplow all six submarine transmission cables. The seasons would have no schedule contingency. If due to unsuitable weather conditions, navigation difficulties or unforeseen circumstances, all six cables are unable to be installed within one season, and additional season would be required, bringing the total seasons required to three. This third season would not allow the Collinsville Substation to be in-service by CAISO's required date of June 1, 2028.