

Attachment A
Project Description



Humboldt Bay Municipal Water District 12-kV Switchgear Relocation Project – Project Description

The Humboldt Bay Municipal Water District (HBMWD or District) is a Special Government District and water purveyor in Humboldt County, CA. HBMWD is a regional water wholesaler and is capable of delivering both potable water through its Domestic Water System and untreated surface water through its Industrial Water System. Via its Domestic Water System, HBMWD delivers potable water to seven municipalities, who in turn serve the residents, businesses, and industries in the greater Humboldt Bay region. The District also provides potable water to approximately 200 retail customers.

HBMWD owns and operates the R.W. Matthews Dam at Ruth Lake in Trinity County, approximately 75 miles away from its Essex Operations Center (Essex), located just northeast of Arcata, CA. At Essex, water is diverted and pumped to meet demand. Municipal water is pumped from an aquifer beneath the Mad River by four Ranney collector wells, situated within the riverbed at depths ranging from approximately 60 to 90 feet. Water is chlorinated at Essex and is pumped from there to HBMWD's Turbidity Reduction Facility (TRF) on Korblex Hill. Industrial water is diverted by a surface diversion facility at Essex and is pumped to the Samoa Peninsula via an Industrial Water System that is separate and distinct from the Domestic Water System.

The District owns storage tanks at the TRF and water transmission mains that tie into the water systems of the municipalities that are served. HBMWD also owns infrastructure on the Samoa Peninsula that includes transmission mains, a storage reservoir, and a booster pump station.

The District's main operations take place at Essex. District facilities at Essex include a control building, chlorination building and equipment, as well as system operations and maintenance buildings and equipment. The District's primary SCADA servers are housed in the Control Building. Also located at Essex is a 12-kV switchgear that provides all of the electrical supply to the Essex Control Facility, the surface water diversion facility, and the four Ranney collector wells that provide the raw water for the potable water system. Under this project, the aging, flood-vulnerable main switchgear that powers all of this equipment would be replaced with new switchgear that would be located outside of the flood and dam break inundation zone. The goal of this project is to protect essential services and avoid loss of potable water service, and associated wastewater and fire service, to 80,000 residents of Humboldt County due to flood and dam break hazards.

The 2001 W&K, R.W. Matthews Dam Failure, Inundation Mapping Study modeled the floodwave from Matthews Dam if it were to fail, and showed that the switchgear is located within the inundation zone and is anticipated to be flooded in the event of a major flood or dam break event (see Figures 2 & 3 in "Attachment C_Figures.pdf" for the extents of the dam break inundation zone). The modeling of the flood wave showed it would inundate the area around the existing switchgear with 7-9 ft of water. The FEMA FIRM map (see Figures 4-5 in "Attachment C_Figures.pdf") shows that the existing switchgear is near Zone A area of 100-year flood. There is anecdotal evidence that the area of the existing switchgear was nearly inundated during the 1964 flood, which is the flood of record for the Mad River, and is considered to be a 50-year flood by FEMA. Flooding of the switchgear would likely short out the switchgear, which would then render all of the electrical gear at the Control Facility, including all the source water pumps, inoperable. A 2015/16 Facilities Plan prepared by GHD (see "Attachment D_Facilities Report.pdf") looked at means to alleviate the flood risk

posed to the main switchgear and recommended that the switchgear be moved to the southeast, to an existing railroad grade that is approximately 2-4 feet above the modeled height of the flood wave. This report and the July 2009 W&K Essex High Voltage System Condition Assessment Report (see "Attachment E_Essex HV Assessment.pdf") were used to estimate the cost of replacing the existing switchgear with switchgear located at the higher elevation.

The proposed retrofit of the switchgear would consist of installing new switchgear approximately 80 ft to the southeast on an old railroad bed. This project would include the permitting, design, construction management, installation of a concrete slab, a new service drop from the existing 12-kV utility line, installation of new wire, conduit, and handholes for the electrical connections required to power the facility, installation of 15-kV cable terminations, and final testing and commissioning of the system.

The railroad grade is at an elevation of approximately 70 ft, which puts it well outside the dam break inundation zone. HBMWD currently has a right-of-way within the railroad alignment; however, this right-of-way agreement would likely need to be modified, or an encroachment permit obtained, from the North Coast Railroad Authority (NCRA) prior to the construction of the switchgear. Discussions have been initiated with the NCRA, and HBMWD anticipates that NCRA will support this project, although no final permit has been issued. The railroad has not been used since the 1970s and no longer has any railroad tracks or ties. It is felt that HBMWD will likely get permission from NCRA to construct on the railroad grade; however, if permission is not obtained, HBMWD will then move the new switchgear approximately 25-feet further to the south, off of NCRA property and back on to HBMWD property. The advantage of the railroad property is that it is already flat and would require a shorter power run. If the switchgear was moved further south onto HBMWD property, additional earthwork would be required to flatten the area for the switchgear. This additional cost has been included in the construction cost with this application. The alternative of locating the switchgear on the railroad property is shown as Alternative 1, and the alternative with the switchgear on HBMWD property is shown as Alternative 2 on Figures 2 & 3 in the attached "Attachment C_Figures.pdf".