# Allison Creek Hydropower. Coming In 2016 To An Outlet Near You

The Allison Creek Hydroelectric Project wrapped up its second construction season in October. This year's work plan focused around the building of the diversion structure, the installation of the penstock, and the inside work at the powerhouse.

The diversion structure, which backs up water enabling a smooth flow into the penstock, took shape this construction season. It requires a wall across the creek that is taller than 20 feet high if you include the portion of the wall that is below ground level.

The diversion structure does not store water but basically splits the water flow into two channels; one channel goes back into the creek and one channel goes into the penstock. Gates in the diversion structure allow CVEA to control the water going into the penstock. If there is too much water coming down the creek, that excess water flows right back into the creek over the spillway. CVEA will use 80 cubic feet per second (cfs) of water to run the powerhouse at maximum output.

The structure, which sits in the creek 1300 feet above sea level, surrounded by very rugged terrain and an extremely steep access road, received over 1000 cubic yards of concrete in 2015.

All the concrete had to be made at the diversion structure location due to the difficulty accessing the site. Despite the challenges of bringing all the materials to this location, testing after each pour has shown top quality concrete.

The diversion structure was 80 percent completed, and the remainder will be finished in 2016.

The pipe that carries water from the diversion structure to the powerhouse is known as the penstock. The penstock builds pressure in the water, as it stacks water molecules on top of other water molecules. There is so much pressure built up in our penstock that the pressure at the powerhouse is approximately 520 pounds per square inch. A stream of water from this pressure can turn a turbine to make electricity.

Once complete, the penstock will be comprised of 171 pieces (most of which are 40 feet long) that will stretch 1.25 miles through the mountains, from the diversion structure to the powerhouse.

The pipe will be buried the entire length of the penstock and will run through the construction tunnel. The upper penstock is 42 inches in diameter and the lower penstock is 36 inches. In 2015 approximately 120 pieces were installed; the remaining pieces, through the most difficult stretch of terrain, will be finished next year.

The powerhouse began this construction season as an empty building. One of the first efforts at the start of the season was installation of the bridge crane. This crane is design to pick up every piece of equipment installed in the powerhouse and to set it in its proper location. Once installed, the crane was used to set the main shutoff valve, the bifurcation valve, the turbine housing, the pelton wheel, the generator stator, the generator rotor, and all other heavy equipment items needing to be placed in the powerhouse.

In addition to the heavy equipment items, the dispatch office and restroom were built and all the heating and ventilation ducting has been installed.

One of the most complicated tasks in the powerhouse was electrical wiring. The building is not only wired for lighting but it was wired for production of power and communications to sensors, controls, cameras, transformers, and much more.

The powerhouse is now connected into the CVEA system and is receiving power through a 3.8-mile feeder line. This is the same line that will send power to CVEA when the plant becomes operational.

The Allison Creek Hydroelectric Project had a very successful 2015 construction season. It is still on target to begin producing commercial hydropower and delivering it to our members' outlets in 2016 when the creek allows a full commis-

sioning of the power plant.

Work on the project will resume next year as soon as weather and snow conditions allow.

Goals for 2016 include:

- Installation of remaining 36 pieces of penstock
- Construction of final 17 percent of diversion structure
- Completion of communications building at diversion structure
- Tie-in of electrical and communications from powerhouse to diversion structure
- Sending water to penstock for the first time
- Performing turbine and generator checks and tests
- Training CVEA Operators to run new power plant
- Generation of commercial power

For project information and up-to-date photos of construction activities, visit the award-winning Allison Creek website at **http://allisoncreekhydro.cveahydro.org** or visit cvea.org and click the Allison Creek logo. If you have questions please contact Sharon Crisp at 822-5506, 835-7005, or email crisp@cvea.org. ■

**Opposite, view of the diversion structure in Allison Creek**
**Top left, construction of the diversion structure, with a view of the Ogee Crest**
**Top right, the pelton wheel inside its casing at the powerhouse**
**Middle left, penstock installation outside of the tunnel along the upper access road**
**Middle right, a helicopter was needed for flying pieces of penstock to the upper reach areas for installation**
**Lower left, installed components inside the powerhouse**
**Lower right, installed penstock in a concrete slurry, prior to getting buried**

Photo courtesy McMillen Jacobs Associates and Sharon Crisp