

Eagle Ranch Construction Inc.

Dylan E. Luckey

Engineering & Building Contractors
Family Operated for 30 Years.

Lic. #903458 - A & B

H.P. Luckey

14721 Ager Beswick Rd. • Montague, CA 96064 • 530-459-3284 • Fax: 530-459-0135 • seveneagles@hughes.net

Cost Quote on "Deer Mountain Hydro Electric Project" for TJU/Earth Peoples United

Quoted by Eagle Ranch Construction, February 2010

The proposed Hydro Electric project at Deer Mountain will comprise of two hydro electric plants installed in two phases: Plant One will be fed from the Frame Creek weir, Plant Two will also be fed by Frame Creek but from the high ditch to the barn.

The following cost quote outlines the costs associated with **phase one and two only**:

Summary of Construction Quote:

(See attached proposal for breakdown of costs and estimated revenue for each phase):

Phase One - Plant One:

Material and Installation	\$ 165,547
Contingency (15% of installation costs \$165,547):	\$ 24,832
Total Plant One:	\$ 190,400

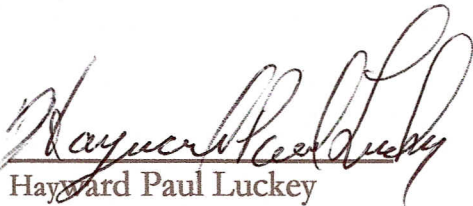
Phase Two - Plant Two:

Material and Installation:	\$ 136,825
Contingency (15% of installation costs \$136,825):	\$ 20,525
Total Plant Two:	\$ 157,350

Total Installation Costs Phase One and Two:

Phase One:	\$ 190,400
Phase Two	\$ 157,350
Engineering and Permits (10% of materials and installation):	\$ 34,800

Total Project Cost: \$ 382,500


Hayward Paul Luckey

2/21/2010
Date

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Hydroelectric Meeting with Paul Lucky Jan 18, 2010, 2 E

There is enormous potential for power on this property! We already have 3-4 CSF water rights for the purpose of producing power as well as for irrigation.

3 Different Hydroelectric Plants are recommended. First Phase would be to build Plant One and Plant Two as one unit, then build Plant Three in a later phase.

PLANT ONE:

Pipe the water from Frame Creek Springs weir (where our water rights initiate) to the high ditch (where the old hydro plant was). We will bring 3.0 CSF of water to the hydro plant, with the rest in the creek to flow naturally. (This is technically a spring that goes into a ditch, not a natural creek, so Fish and Game do not have to be involved.) After the water goes through the hydroelectric plant, then we will irrigate with it. Some of the water will stay in irrigating pastures, meadows, greenhouses during summer months. Plant One built on high ditch, all water would go through and then go to high ditch.

The power generated would go into power lines to the barn, where we will interface with Pacific Power and Light (PPL) - Pacific Power energy company in this area. Until that point we will have control of all the power we generate to use for our own needs. Build the line ourselves for 10 poles, \$30,000 versus if PPNL puts in the poles, it would be \$50-60,000.

This plant will be synchronous, meaning it can start on its own and does not need the grid to get it started. This will allow us to produce our own power for whatever we will need it for to power projects, buildings, and homes on the land. Synchronous plants are about \$10,000 more but give you the ability to be off the grid. Then whatever power is left can go down to the barn and be sold to PPNL.

Bypass load dumping capability and/or turn it down if the grid does down. Powerplant bypass adjustable valve needed, for synchronous generators will keep producing energy, so we need to do something about it. Should be able to get it down to 30 KB, but that energy must be used or it shuts itself down.

Construction Needs:

- ⇒ Starting from water source, we have to construct a concrete box with a trash rack to collect the water and keep the garbage out, as we need clean good water that will be put into a pipeline.
- ⇒ 2000' of pipeline PIP (pressure irrigated pipe).
 - That will become Penstock that feeds the generator, will transport the water from the weir directly to the generator.
 - 2000' of pipe buried at least 2' deep minimum,
- ⇒ Every 200' there will be a concrete thrust block/collar. Now we have gone 2000' to building

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- ⇒ There has to be a concrete raceway built
 - Raceway approx 2x2' wide.
 - All the water that goes through the generator gets discharged into a concrete raceway.
 - Will have three ends on it
 - one to irrigation high ditch
 - one that leads to next Penstock to lead to generator 2
 - one that allow some water to go back to the creek.
- ⇒ Need to build a generator house for generator and switch gear.
- ⇒ Need 6 transformers- 3 at the plant and 3 at the interface.
- ⇒ Will probably be required- needs an isolation bank.
- ⇒ Need to build a power line from the generator to the barn where it will be interfaced.
 - For an overhead transportation line need 10 power poles, 3000' total distance, no more than 300' between power poles.
 - Need 6000' of wire.
 - Should be able to put the power lines underground, but Paul will need to research the requirements and costs, as there will also be water lines underground, and this generates a lot of heat.
- ⇒ Suggested to put a telephone line in as well line on the poles when we bring them down to signal that the power is off if the grid goes down.

Estimated Costs for Plant One:

- ⇒ \$76,300 for synchronous generator (see attached estimates from Robert Prior from Dependable Turbines)
- ⇒ Power line: 3000', 3 transformers, 10 poles, cross-arms and wire, and \$4,000 for labor:
\$32,047.00
- ⇒ Pipeline: 2000' PIP plastic pipe: \$21,600, Labor: \$8,000 = \$29,600
- ⇒ Concrete work: \$6,600. Steel inside concrete: \$1,000 Labor: \$20,000. Total for building and concrete: \$27,600
- ⇒ \$89,247.00 + \$66,000 for equipment= **\$165,547 TOTAL for synchronous generator**

Estimated Income for Plant One:

If we only take 3.0 CSF of water to leave some to flow naturally on the land, then we would produce 38 KW/hr. 38 KW per hour at \$.08 per KW x 24 hrs a day x 365 days a year = **\$26,630 a year**

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PLANT TWO:

Build by barn, fed by Frame Creek Springs. In the winter when there is no need to irrigate, take same water that goes through 1st hydro plant into high ditch, and shut the ditch off, and put into a pipe and transport down to barn. Sell both the power that is generated by Plant One and Plant Two to PPNL, as separate contracts. This plant would be an induction plant, since it will be connected to the grid and primarily producing power as income, as Plant One will be generating power for buildings. When there is the need to irrigate, this plant will not be operating. (Thunderstorms can also come in late June/early July. Then you have 10 days without irrigating when you can use to create power). This plant will not require power poles or lines, as it will already be at the interface with PPNL.

An induction generator producing 46 KW can run 15-20 houses, greenhouses, and still needing ways to use the power. Power has to be used if the grid goes down. An easy way to discharge a lot of energy is to have heating coils that can heat water. A/C Power is considered "lightening in a bottle", as it must be used or generator can explode. The power is run through copper coils to control the energy. Induction has to be fed by the grid, tied into the grid. PPNL provides the negative charge, so if the power goes down, then the induction generator will go down.

Estimated Costs for Plant Two:

- ⇒ 3 more transformers @ \$1875 each = \$5625.00
- ⇒ Pipe: \$32,400.00 for 3,000' of pipeline
- ⇒ Concrete: \$7800
- ⇒ Labor will be intensive due to all the rock: High estimate: \$25,000
- ⇒ Induction generator: \$66,000 (see attached estimate from Robert Prior with Dependable Turbines)
- ⇒ **TOTAL: \$136,825**

Estimated Income from Plant Two:

45 KW production per hour at \$.08 per KW x 24 hrs a day x 365 days a year = **\$ 31,536 per year**

Total estimated costs for both power plants	\$302,500
Engineering and permitting are about 10% =	\$ 30,000
Contingency (15%) =	\$ 50,000

TOTAL for both power plants, engineering and permitting: \$ 382,500

Estimate 4-6 months for both power plants to complete the project (work on the land). What takes the longest is that everything needs to go through an engineer, needs permits. Water Quality Control, Water Resources Development, Fish and Game, Corps of Engineers, other agencies must sign off on it. Need signed contract with PPNL. **Sign contract first before doing anything or spending any money.**

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