



Covington Water District Pipeline Turbine Project

Today's Speakers

Tom Malphrus

Covington Water District
tom.malphrus@covington
water.com



Andrew Williamson

McKinstry
andrewwi@mckinstry.com



Mark Nieman, P.E., CEM

McKinstry
markn@mckinstry.com

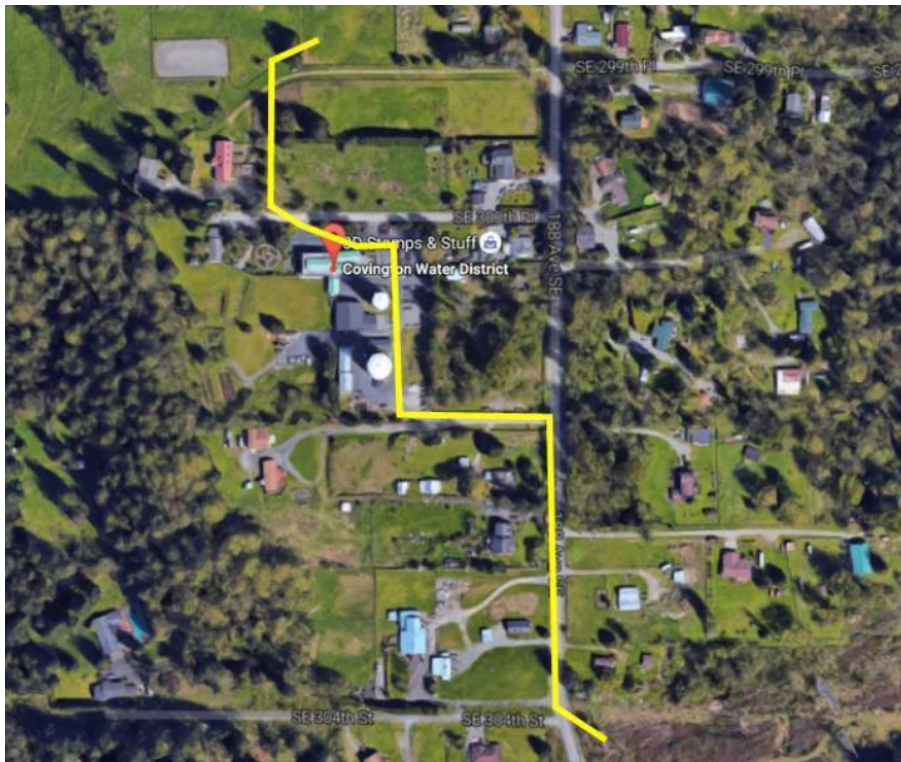


Covington Water District is Growing

- Regional Growth
- Population Growth
- Water Demand Growth
- Plans to meet growing population water demand
 - Planned main line addition
 - Planned infrastructure development



The Plan To Accommodate Growth



- Tacoma Water tap & CWD transmission line
- 16-inch DI line
- 1,425 linear feet
- Terminates at North Tank and serves 660 Zone and Storage Tank
- Turbine located near Administration Building

An Innovative Approach

- New Tacoma Water-Tie
 - 3rd feed into the Covington Water District
 - Originally planned for a PRV in a vault
 - Source water at the Howard Hanson Dam
 - Feeds the 660 Zone of CWD
- New pipeline planned through CWD property
- Future storage tank replacement planned for safety and growth



A Perfect Storm of Opportunity

- On-site net-metering shows up as reduced electric consumption from PSE (turbine next to demand)
- CWD operates uniquely with supply flowing in the pipe: 24/7 production
- Ability to offset cost due to larger project build (PRV vault offsets cost of turbine building)
- WA Commerce Energy Conservation Grant (energy and cost savings for the Admin. site; not available if selling power directly to the grid)



Other Types of Opportunity



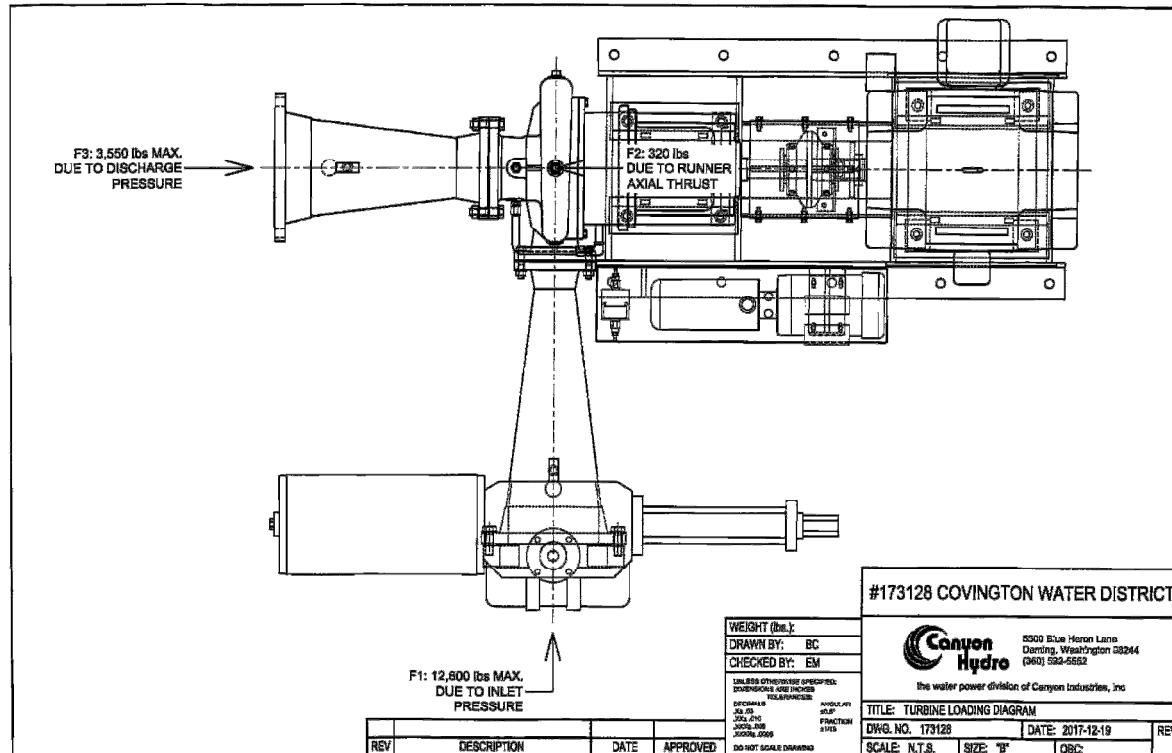
- Footprint of turbine building is small considering the rate of production
- Costs controlled and performance guaranteed through Washington ESCO program
- Using a turbine instead of a PRV could capture the losses as electricity generation

Site Details

- Turbine Building near the Administration Building
- Construction process and infrastructure buildout



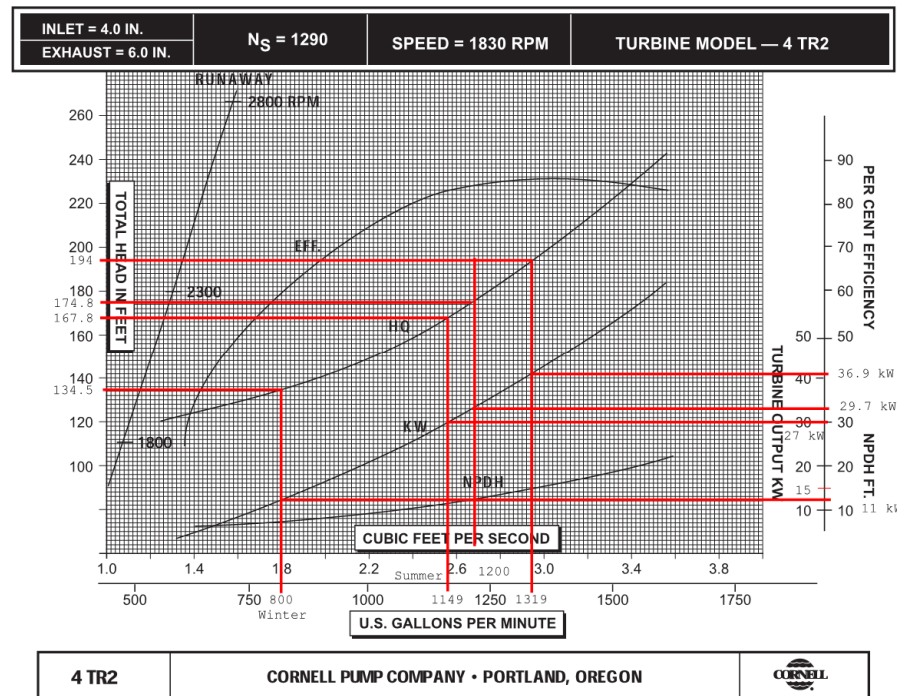
Turbine Details



Flow Profile

• Technical Specifications

- How the turbine works
 - Reverse pump
 - System sees it as an orifice plate
 - Acts as a PRV for the system
 - Generator is constant speed at 1800 RPM
 - 8-36 kW output power depending on flow
 - Requires grid-power to operate (induction generator)



Control Details

- Technical Specifications
 - Net-metering
 - Acts just like PV solar panel to grid
 - No inverter
 - Native 3 Phase AC power
 - PSE roles and thoughts
 - Reviewing safety interlocks and relays
 - Installation of net meter
 - Agreement for net meter rate
 - Utility side disconnect inclusion



Making The Utility Connection

- Why we chose this solution (versus other options)
 - Local turbine provider (all Washington-based)
 - Best technology for our specific application and size
 - 174,300 kWh/year with turbine vs. ~20,000 kWh with Solar PV
- Need for bypass/backup and maintenance option
- PRV provisions in line and in parallel



System Backup

- Bypass
- Pressure Relief Valve
- Hydraulic Actuator



Video Break/Intermission



Construction Progress



Expanding Project Scale Through Grants

- Awarded \$79,447 from WA State Department of Commerce in mid-2017
- Commerce Energy Efficiency Grant
- Grant covers nearly 25 percent of turbine installation costs
- Work must be completed in 2017-2019 biennium
- McKinstry handled all grant paperwork with the state



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Innovation is in our nature.



Project Financials

Facility Improvement Measures	Facility	Budget *	Annual Utility Savings	Commerce Grant	Net Customer Cost (with Incentives)	Simple Payback (SPB) (with Grant)
10.03-CWD Provide Water Turbine at New Intertie	Admin Gas and Electric	\$376,749	\$16,066	\$79,447	\$297,302	18.5
30.01-CWD Provide C-4 Intertie Pipeline	Admin Gas and Electric	\$1,926,453	\$0	\$0	\$1,926,453	Needs Based
Totals		\$2,303,202	\$16,066	\$79,447	\$2,223,755	

*Costs shown are inclusive of construction, engineering, project management, permits, fees, taxes, etc.

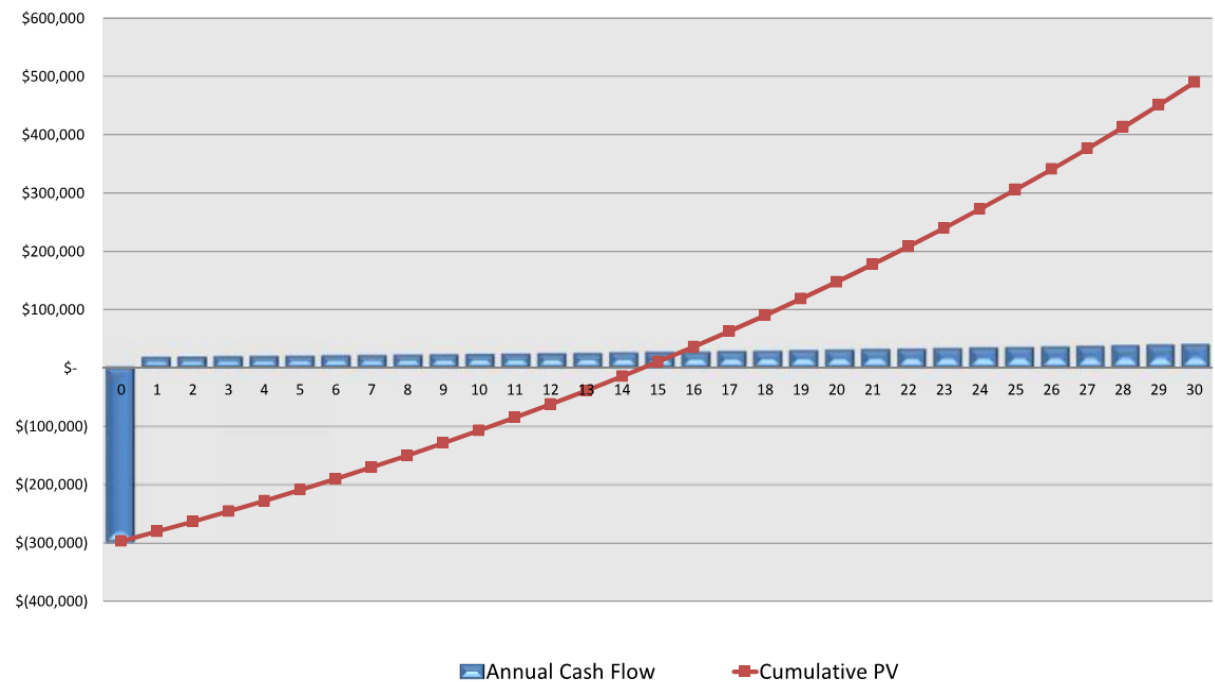
*Costs also include provisions for future turbine



Project Financials, Part 2

- Grant from WA State Department of Commerce
- Performance contract
 - WA DES Energy oversight
 - Guaranteed 174,342 kWh/year savings
 - Estimated \$16,066/year saved (2018 electric rates)
 - One-year M&V Period
 - \$376,749 Guaranteed Maximum Cost

Annual Cash Flow and Cumulative PV



Fiscally Conservative

- GMAX Project Cost: Turnkey delivery
- GMIN Energy Generation
- Payback information
 - Includes today's utility rates, no escalation
 - Includes today's loads – not future growth
 - Includes costs for turbine building
 - Includes costs for second turbine provisions

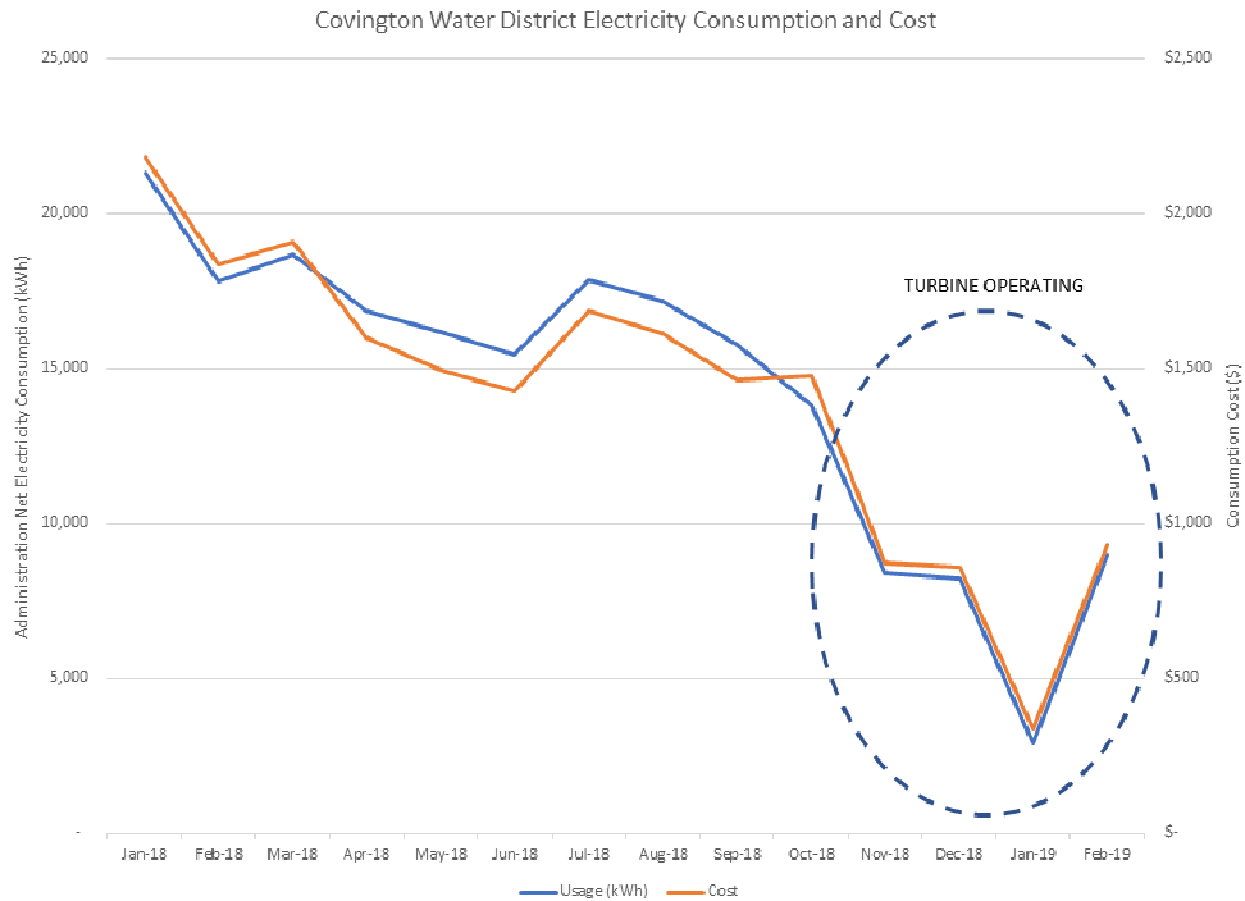


ESPC Advantages

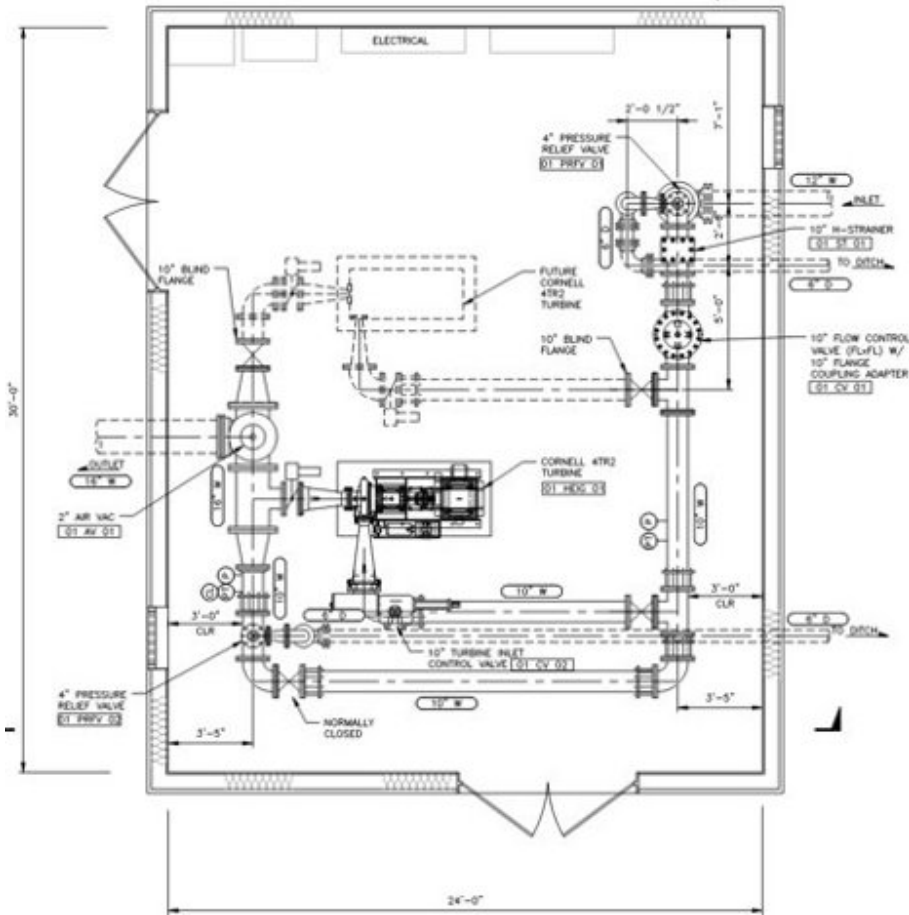
- Single point of accountability: the ESCO
- No requirement to use the lowest bid
- Owner participates in equipment and subcontractor selection
- Funding through energy and utility savings
- Verification of annual energy savings through a M&V program
- Guarantees:
 - Maximum Project Cost
 - Energy/Water Savings
 - Equipment Performance



Verified Performance



Planning for the Future



Finished Product Shots



Opportunities for Replication

Is a project like this right for you?

1. Net metering (turbine next to demand)
2. Does system flow profile support the turbine financials?
3. Are you able to offset cost due to larger project build (PRV vault offset cost of turbine)?
4. Any grant opportunities, etc.?



Project Partners



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Questions?

