

ANDERSON VALLEY PINOT NOIR



COMMITMENT TO STEWARDSHIP

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Goldeneye Winery's new production facility at Gowan Creek Vineyard, only 20 miles from the Mendocino Coast in the small town of Philo, CA, is the latest accomplishment for Duckhorn Wine Company. With an impressive portfolio of wineries, including Duckhorn Vineyards and Paraduxx in Napa Valley, and Goldeneye based in Anderson Valley, the new production facility addresses the Goldeneye brand's need for growth as its Anderson Valley Pinot Noir project comes of age.

Goldeneye gets its name from a small Northern Hemisphere sea duck with black and white plumage and bright yellow irises. "We are a family of ducks," Dan Duckhorn once stated.

In 1996, Duckhorn Wine Company established itself in Anderson Valley and began developing its first estate vineyard for Goldeneye. Today there are 220 acres of Pinot Noir planted on five estate vineyards, with 19 clones on 11 different rootstocks. This provides Goldeneye Winemaker Zach Rasmuson with a rich and diverse palette of fruit with which to compose the wines. Goldeneye's Pinot Noir program was designed to create estate wines using small-lot artisan winemaking techniques.

In turn, this winemaking style helped shape the function of the new winery structures. Throughout their operations, the winery owners have made a commitment to environmentally-conscious stewardship of the land.

Goldeneye began in the Anderson Valley by establishing hospitality facilities in a beautiful old farmhouse on the Confluence estate, which they converted into a tasting room in the late 1990s. In a century-old redwood barn at Gowan Creek, another estate property four miles down the road, they made their first vintages. As the vines matured, and both the estate program and production increased, it was apparent that it was time to build a new winemaking facility.

Designed in collaboration with Rasmuson, the new winery is a production-only building located next to an existing barn (which housed the old winery) and is capable of producing

Windows provide daylighting into fermentation room, with solar panels on cool roof.

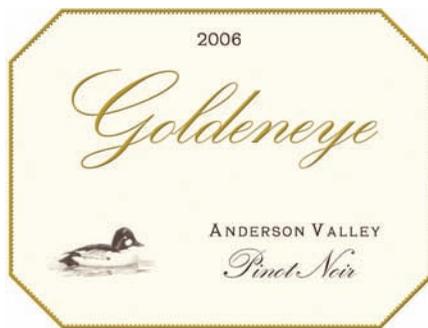
60,000 cases annually, although the 2009 harvest was far short of that. The owners wanted the new winery to blend in with the rural farmland setting, and much of its aesthetic inspiration comes from the adjacent barn.

The winery was designed with a 7,000-square-foot fermentation room that has removable catwalks, three overhead pneumatic punch-down devices, two basket presses, and six closed-top tanks to receive press wine. The fermentation room holds up to 100 movable 3-ton open-top fermentation tanks.

"We designed the winery to optimize open space and artisan techniques," says Rasmuson. "We can highlight our vineyard diversity by working with individual lots of fruit. About 20% of the fruit is cold-soaked between 24 and 96 hours at 55°F. A combination of a 15-ton glycol unit and nighttime cooling achieve the cold soak temperature. The desired maximum fermentation temperature is in the low 80°F, as the 3-ton fermentors do not produce too much heat."

Planning for LEED

LEED is Leadership in Energy and Environmental Design, a point-rating sys-





Each portable 3-ton fermenter from Custom Metalcraft holds 750 gallons and is designed with a 1:1 ratio. The rugged tank of 304-stainless steel construction has a sloped bottom and tri-clover fitting for discharge. When the tanks are not in use, they can be stacked and stored with a pallet jack or forklift.



tem established by the U.S. Green Building Council (USGBC) to determine how many sustainable features are designed into a building. The new winery was to reflect this desire for sustainability.

The design team's task was to go beyond a conventional design approach and find creative solutions and a more holistic approach. In order to achieve as many sustainable features as possible, they involved the entire engineering team from the early stages of design. Currently this project is being reviewed by the USGBC and a gold level rating is anticipated in summer 2010.

Sustainable building elements

The new facility is a rather modest production building, without showcase or hospitality features. It is highly energy-efficient, reasonably inexpensive, durable, and designed to maximize production.

The building is divided into four main zones: administration area in the southwest corner; fermentation area in the southeast corner; tank breezeway in the middle and north of fermentation; and barrel storage on the northern side, with storage and mechanical areas adjacent in the northeast corner. A mobile bottling truck will handle wine bottling.

Rainwater is collected in roof gutters and diverted to a sump, which is then pumped to a pond and later used for irrigation. A 32-kilowatt solar photovoltaic array on the south-facing roof of the fermentation room produces 39% of the winery's energy needs.

All mechanical units, including heating, cooling, ventilation, and refrigeration, were selected to exceed California energy standards, and the overall performance of the building complex was designed to significantly exceed a baseline industrial model.

Night-air cooling is employed to augment mechanical cooling of the barrel rooms and high efficiency lighting is installed — both key factors in LEED certification.

The use of concrete rather than asphalt paving significantly reduces heating of the yard slabs (called heat-island effect).

The winery has a steel frame system provided by Soule Building Systems



Smart Fog in each barrel room is programmed for 10-second dispersal every 30 seconds. System activates within 2% of setpoint (75% humidity).



Six blending tanks in breezeway between fermentation room and three barrel cellars.

(Cotati, CA), who also installed metal-clad insulated wall panels. Steel construction is very efficient for the long spans desired for wine production facilities. Numerous benefits include cost efficiency, minimal maintenance, and ease of construction. As an additional benefit, steel is a material that has 80% of its content recycled.

The fermentation room experiences a high volume of forklift and pallet-jack traffic with portable fermentors being moved in and out during harvest. Four-foot high concrete perimeter walls allows for durability, low maintenance, and easy hose-down for cleanliness.

Natural daylight eases task visibility while promoting comfort and well-being for workers. In winery design there is a delicate balance between the value of natural light and a reduction of heat gain, especially in the barrel rooms where a high thermal containment is necessary. At the new winery, the “cool

roof” feature reflects nearly as much heat as it absorbs, which lessens heat gain for the building.

All building materials were selected for the absence of toxic volatile compounds and to provide a careful balance of industrial utility with energy economy. In addition to all the sustainable features of the new winery, 98% of all construction waste from the project was recycled during construction.

Energy efficiency

To qualify for a LEED rating, a building has to meet or exceed several standards. The building energy analysis of the new winery consisted of looking at the three main building components comprising most of the building’s energy usage: the building’s envelope, lighting systems, and mechanical systems.

“Winery projects are a mix of commercial and industrial uses,” explains Kevin Gilleran of Gilleran Energy

Management (Santa Rosa, CA). “The USGBC LEED program requires that all energy used at a new facility be included in the energy analysis process.”

The analysis of the Goldeneye Winery found its annual energy use includes the following areas:

- Office/lab area (covered by state energy code): 21%
- Lighting in barrel and fermentation areas (covered by state energy code): 39%
- Process energy use — fermentation cooling, barrel building refrigeration, lighting in work areas (not covered by code): 40%

“Process energy use in the Goldeneye project accounts for at least 40% of the anticipated annual energy use and is not allowed to be part of the energy savings program, according to the USGBC, primarily because there is no recognizable standard against which energy savings can be compared,” adds Gilleran. “This



Fermented Pinot Noir grapes discharged from fermentor into basket for pressing.

may change soon because the California Energy Commission is now regulating refrigerated buildings.

"The barrel building has an integrated night cooling system supplemented by an air-cooled direct expansion refrigeration system. This is an innovative way to cool buildings that operate in a temperature zone that can be cooled by night air. The barrel building will be maintained between 55° to 65°F year-round. Night-air cooling is a perfect match for this need.

"Energy savings, according to the USGBC, can only be taken in the areas covered by an energy code, either California's State Code or the ASHRAE 90.1 standard. Energy savings for this project came from the following areas: high efficiency lighting, lighting controls (occupancy sensors and daylighting controls), a well-insulated envelope, high-performance glass, and high-performance air-cooled mechanical systems.

"The energy savings for the high-efficiency measures accounted for about 8% of the total project energy usage. In anticipation of this issue, the project installed a solar photovoltaic renewable energy system that offsets an additional 39% of the annual energy usage.

"A winery with none of the above energy efficiency measures or renew-

able energy would have about \$22,000 in annual energy costs. Goldeneye Winery's annual energy costs, after implementation of the above measures, is anticipated to be about \$11,609, for a reduction of about 47.4% in annual energy usage."

Goldeneye received a rebate from the federal government for installing the solar electric system. The rebate came from the 2009 American Recovery and Reinvestment Act that gave back 30% of the total cost of the system (cash rebate came from the California Solar Initiative, for a total 42% offset for the cost of the system.

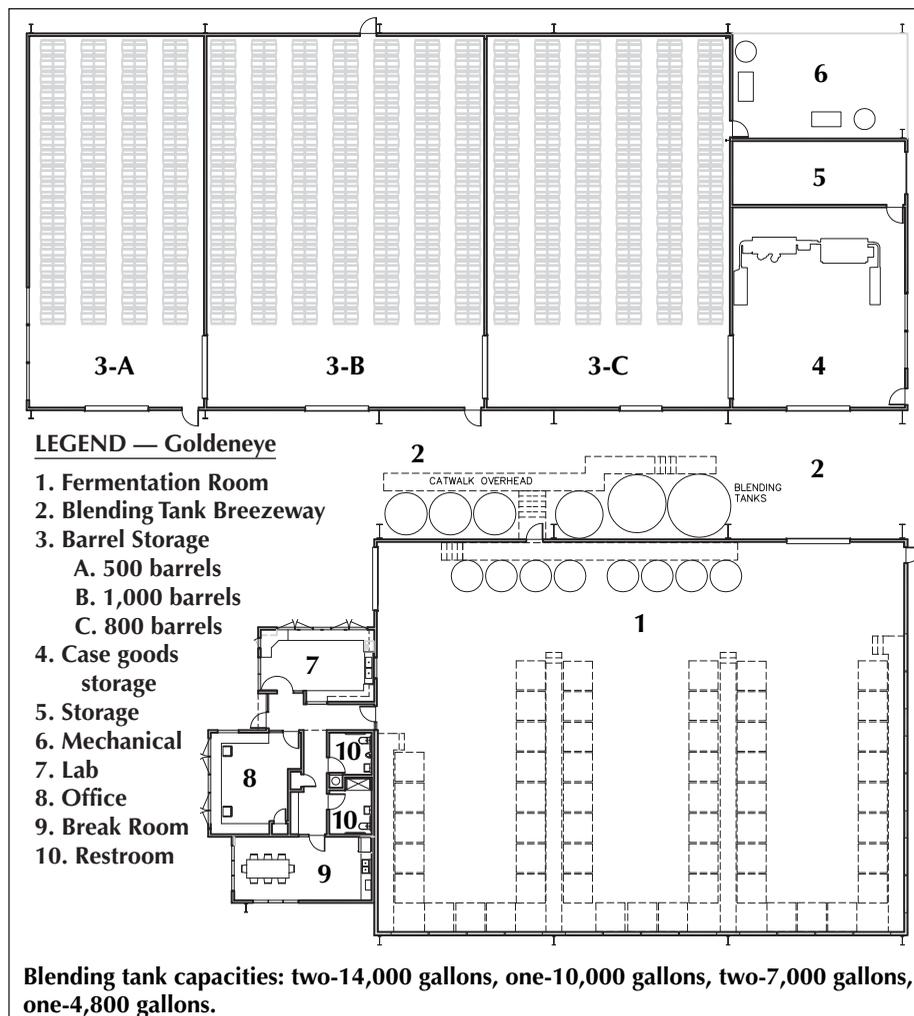
The building's envelope refers to the type of construction and insulation levels for the walls and roof, and type of construction of windows and doors, including any high-performance glazing.

Project employs high levels of insulation:

- a. Barrel Rooms, panelized walls: R-37
- b. Barrel Rooms, panelized roof: R-35.8
- c. Fermentation Room panelized walls: R-18.8
- d. Fermentation Room panelized roof: R-24
- e. Office Area framed metal walls: R-21
- f. Office Area panelized roof: R-24
- g. Windows and doors: Metal-framed system with double-pane low-e PPG Solarban 60 glazing

Lighting systems included the following measures:

- h. High performance T-8 or T-5 light fixtures with electronic ballasts
- i. Controls that will automatically turn off some of or all lighting when the space is not in use. The system typically uses an occupancy sensor and, as needed, a photocell sensor to turn off lighting during the day when daylight is available and adequate.



Heating, cooling, ventilation, and refrigeration systems:

j. High-efficiency split-system heat pumps for the office and lab areas.

k. Split system cooling-only refrigeration systems for barrel rooms. This area only uses the refrigeration when needed to backup the integrated night cooling system.

Analysis of the building indicates that the project meets and exceeds national and local codes by at least 14%. As noted above, the solar electric system, 32 kW DC power, is predicted to produce about 39% of the annual energy usage.

FSC-certified wood

Much of Goldeneye Winery's aesthetic inspiration comes from the adjacent historic barn that was the original winery. One of the earliest barns in Anderson Valley, it is made entirely of old-growth redwood, milled from trees harvested not far from where it has sat for over a century.

Goldeneye wanted the new winery to complement the original barn and blend into its rural farmland setting. The redwood siding is certified by the Forest Stewardship Council (FSC) and was harvested from estate land owned by Goldeneye. The trees were locally milled, stickered, and cured four years prior to construction.

Exterior siding materials were chosen to complement one another in a beautiful, earth-friendly, and utilitarian way. By using redwood board and batten siding adjacent to corrugated metal, interesting shapes and contrasts were created. The objective was not to

allow one material to overwhelm another, but rather to have them complement each other in combinations — natural with manufactured, warm with cool, and random with controlled.

Mechanical systems

Reliability, minimal maintenance, efficiency, low noise, and good aesthetics were prime criteria to achieve approximately 75% humidity in the barrel rooms. The "Smart Fog" system (www.smartfog.com) was selected because it is virtually silent, does not need concurrent fan operation, and will be virtually drip-free (if maintained per factory specifications). Dry fog uses reverse osmosis (RO)-treated water (the system is furnished with an RO-generator and storage tank) at line pressure, and compressed air to pulse a cool fog from the distribution nozzles. The compressed air provides the motive force for fog distribution.

"Cooling of the barrel rooms is accomplished via single-zone air-cooled condensing units and unit coolers (a direct expansion or cooling system)," explains Rob Main of TEP Engineering (Santa Rosa, CA). "Each barrel room has two unit coolers and one condensing unit. The condensing units have an option for recovering heat for a future hot water pre-heating system.

A comparison of the operating efficiency, reliability, and performance of the direct expansion cooling system to a glycol system determined that the direct expansion system was superior in all categories.

"The barrel rooms have night-air cooling and CO₂ exhaust systems. The

night-air cooling (NAC) system takes advantage of the cool nighttime ambient conditions to provide 'free' cooling to the barrel rooms. Typical fall conditions will allow passive NAC to 58°F. The CO₂ exhaust system evacuates CO₂ produced during fermentation."

"Malolactic fermentation occurs in barrel," adds Rasmuson. "We aim for 68°F and utilize passive warming by manually turning on the intake fans during the warmest part of the day. We do not rack any Pinot Noir in barrel until bottling. We top the barrels monthly."

The office and lab are heated and cooled via split system heat pumps. The heat pumps were used to take advantage of the site-generated power via the solar electric system.

Conclusion

Will a LEED winery somehow improve wine quality? "The short answer to this question, in my opinion, is yes," replies Mike Lucia, assistant winemaker. "It is not just the new 'toys' or equipment which are great, that give us a remarkable degree of responsiveness and flexibility — though the fundamentals of our wine-making style remain unchanged. The overall morale of the production team has increased dramatically because we feel we are a part of something very special.

"The new winery has given us a sense of awareness in our environment and a greater connection to our Gowan Creek Winery. What I am witnessing now is an increased level of personal ownership from everybody on our crew. In turn, that individual connection is affecting and touching the wine on a more harmonious level." ■

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