



Peter R. Baye, Ph.D.
Botanist, Coastal Ecologist
P.O. Box 65
Annapolis, California 95412



(415) 310-5109

baye@earthlink.net

Allen Robertson
Deputy Director
California Department of Forestry and Fire Protection (CAL FIRE)
Sacramento, CA

July 28, 2009
via e-mail

SUBJECT: Artesa (Codorniu Napa) Fairfax Conversion Draft Environmental Impact Report (EIR) - comments

Dear Mr. Robertson:

I am submitting the following comments on the Draft EIR for the proposed Artesa Fairfax vineyard conversion project in Annapolis, Sonoma County, CA. I have previously submitted comments on the first (withdrawn) THP for the antecedent of this project from 2001, the (withdrawn) Mitigated Negative Declaration for the antecedent project, the Notice of Preparation (NOP) for the second (current) project description in September 2004. During the extraordinarily long delay between the NOP in 2004 and the DEIR release in April 2009, I submitted comments to you explaining objections to CEQA consequences of the extreme 4.5 year delay in DEIR release (August 14, 2008), and the unannounced pre-release of the DEIR as a supporting document of the new 2009 THP for the project (March 15, 2009), as well as e-mails inquiring about the missing DEIR and the consequences of a “stale” environmental baseline of 2004. Please include all these communications on the DEIR as part of the comment record.

My qualifications to provide technical comments on the CEQA document include a Ph.D. in Plant Sciences, 30 years of professional experience as an applied ecologist (emphasis on planning, restoration, and management of coastal habitats and vegetation), EIS/R and regulatory management as a staff biologist for the U.S. Army Corps of Engineers, endangered species recovery planning and regulation for the U.S. Fish and Wildlife Service. I have 25 years experience with study of California coastal vegetation, and I have been a full-time resident of Annapolis since 2002, where I have gained detailed first-hand knowledge of the terrestrial, wetland, and aquatic habitats of the region, in addition to direct observations of wildlife and vineyard installation and operation.

The extraordinary delay in the DEIR release remains unjustified. While some data were collected since 2004 (NOP date; one of a series of wet years) to address inevitable gaps in environmental analysis of potentially significant direct project “footprint” impacts (such as accurate plant species inventory and wildlife surveys), the DEIR failed to use the 4 year gap to prepare an adequate inventory of archaeological resources or study the unprecedented summer 2008 dewatering of the reach of Gualala River Wheatfield Fork where it normally flowed adjacent to the Annapolis vineyard district, an important event to which I alerted you in writing in August 2009. The failure to capture summer 2008 data relevant to analysis of cumulative impacts of vineyard hydrologic modifications in a drought year, while continuing to rely on tendentious comparative hydrologic data from the forested North Coast Caspar Creek CDF watershed study as a substitute for site-specific hydrologic impact analysis of Artesa’s Annapolis project, makes the 4 year delay particularly unacceptable. It appears that the four year delay has been used arbitrarily to collect data supportive of project authorization (biased towards support of “less than significant” impact determinations or determinations of adequacy for superficial mitigation measures linked to understated impacts), while ignoring data that would pose a challenge to authorization (e.g., comprehensive cultural resource inventory, drought effects on sensitive aquatic resources).

In addition, the applicant has submitted an entirely new (2009) Timber Harvest Plan (THP for 171 acres, containing all substantive technical detail of the Timber Conversion Plan) which is substantially larger than the original proposed THP (105 acres). CAL FIRE and the applicant have already withdrawn the previous Mitigated Negative Declaration. In content, size, and administrative record, the current (2009 THP and EIR) project is a new project, and a larger one that defeats the intent of CEQA to minimize and avoid environmental impacts. It also defeats the clear intent of the Sonoma County major vineyard conversion ordinance, from which the original (2001), smaller project was exempt because it was antecedent to the 2005 ordinance. There was an 8 year gap and period of prolonged (nearly 5 years) permit inactivity between the two THPs. The current project is not a “modification” of the original project, which was withdrawn; the gratuitous addition of over 60 acres of forest-to-vineyard conversion to the antecedent proposal was submitted as a request for authorization after the County ordinance went into effect in 2005.

Thus, the current (2009) expanded project is *not* as a whole exempt from the County’s conversion ordinance. The cumulative extent of Sonoma County jurisdiction over the project as a whole exceeds that of CAL FIRE. The profound defects in the DEIR and profound CAL FIRE confusion in coordination of CEQA and the THP review process (see my correspondence to you dated May 15, 2009, citing Santa Rosa CAL FIRE letter to the applicant that inquired to the applicant rather than your office how the THP and EIR would be coordinated!) justify a transfer of the CEQA lead agency status and EIR process to Sonoma County Permits and Resource Management. The EIR mitigation requirements for the non-exempt 2009 permit application covered by the EIR must comply with the requirements of the Sonoma County conversion ordinance. The current project based on the 2009 application for a larger project a new has no valid claim procedurally or otherwise to “coattail” on the exempt status of its long-withdrawn, smaller antecedent. The contrary conclusion would allow Artesa, in principle, to acquire and annex additional land and expand

vineyard conversions indefinitely under the exemption of the original 105 acre THP conversion proposal, which would be plainly unreasonable. The lapse of exempt status under the County ordinance is entirely due to the unwarranted, rapacious expansion of the conversion area proposed, and the extraordinary delay in project environmental review and permit process.

Cultural resources – The DEIR analysis of cultural resource impacts and mitigation fails to consider the Pomo village site complex as a whole, and its eligibility for status as an archaeological district and National Historic Register status. Please refer to conclusions of expert EIR comment letters submitted independently from Miley Holman and Prof. Peter Schmidt of the University of Florida. In “piecemealing” fashion, the DEIR inappropriately proposes incremental mitigation for impacts to individual artifact occurrences, and relies on inadequate non-methods of detecting undiscovered artifacts. The project will likely result in significant impacts to an entire archeological district composed of the village site and satellite camps, including the not only material artifacts but also the ethnobotanical setting (potentially significant remnants of economic aboriginal plant populations, relicts of prehistoric grassland and oak woodland fire management for food and fiber plants or oak plantings, game management, sun exposure, pest management)

According to Miley Holman’s expert review (July 2009) of past archeological surveys of the site, there is substantial doubt about the original adequacy of outdated Neri survey of 2001. This skepticism is reported to be shared independently by Prof. Peter Schmidt (archeologist) of the University of Florida. Archeological deposits are likely to be substantially larger than previously proposed. A comprehensive inventory of the archaeological resources of the whole project area is necessary and warranted, applying rigorous subsurface investigation techniques. The site as a whole should be reevaluated by qualified professional or academic archeologists as an archaeological district. The inadequate mitigation measures based on preconstruction detection of unidentified cultural resources by non-experts, in the absence of advance comprehensive inventory, must be replaced by “up-front mitigation” based on rigorous advance identification of the full scope of the site’s archaeological resources.

Alternatives analysis – The DEIR fails to justify a minimum economically viable size for a reduced project alternative, and fails to account for the evident economic feasibility of antecedent, adjacent vineyards with substantially smaller vineyard acreage and no reservoir development. The DEIR fails to account for the previous Artesa proposal to convert 105 acres of vineyard rather than 171 acres, indicating feasibility of a project of at least a 105 acre project that is arbitrarily rejected as economically infeasible in the current EIR, and at a time when economic viability of premier grape production is in severe decline (The Wall Street Journal, July 9, 2009: *Luxury Wine Market Reels from Downturn*, by Jim Carlton and David Kesmodel; Santa Rosa Press Democrat, July 9, 2009: *Grapes go unsold as economy takes toll on wine sales, growers find wineries aren't buying*, by Paul Payne).

The DEIR fails to consider commercial availability of other Pinot Noir-suitable sites currently undeveloped but proposed for other projects that expressly intend as part of their business plan to develop and sell individual parcels as vineyards (Preservation Ranch). The

DEIR fails to consider a reasonable “market area” or “service area” for alternative sites that could produce premier wine grapes in prior converted croplands and prior converted agricultural watersheds. The applicant arbitrarily and excessively narrows the project purpose to the specific varietal grapes and climate that recently have grown optimally in Annapolis, and without consideration of forecast climate change that is likely to shift the location of this microclimate. The alternatives analysis even appears to suggest that forest conversion *per se* is essentially part of the project purpose, rather than instrumental to its basic purpose, which is entirely unreasonable and contrary to the purpose of the analysis under CEQA. Finally, the DEIR fails to address contemporary (2009) and forecast adverse economic and market conditions for (overproduced) premier wine grapes when it considers economically feasible alternative project sizes.

The alternatives analysis is unacceptably flawed and biased as a rationalization of the project. It must be thoroughly revised to address current and forecast economic conditions, market conditions, land availability, objective assessment of minimum feasible local project size, and should be peer-reviewed by an independent expert agricultural economist.

Biological Resources

Facilitation of non-native predator invasion (bullfrog) of Gualala River by cumulative addition of vineyard reservoir (permanent pond habitat). The construction of yet another reservoir in Annapolis provides significant adverse additional habitat for non-native bullfrogs (*Rana catesbiana*, syn. *Lithobates catesbianus*), a harmful invasive predator that has spread rapidly along the Gualala River Wheatfield Fork in the vicinity of Annapolis vineyards in the past two years of low winter flows and expanded agricultural reservoir operation. This species has been listed as one of the top 100 of the world’s worst invasive species by the Global Invasive Species Database (<http://www.issg.org/database/species/ecology>), and is recognized as an extremely harmful invasive non-native predator by the California Department of Fish and Game. The tadpoles of this “pond frog” species generally require two years to metamorphose in deep, perennial stillwater (lentic) freshwater habitats provided by reservoirs. They are subject to mass mortality and local extirpation by high velocity winter river flows. The constellation of vineyard reservoirs in Annapolis provides this invasive species with potential permanent refuges and breeding habitats within dispersal distance to creek corridors and connections to the Gualala River, where they may prey on native amphibians, reptiles, fish, and any food item small enough to fit in their mouths. Potential indirect and cumulative impacts of additional reservoirs in the spread, abundance, and persistence of this invasive species are significant, and were not identified, assessed, or mitigated in the DEIR. DEIR identifies bullfrog predation as threat to native amphibians, but fails to disclose or quantify increase in abundance and distribution of bullfrogs in Gualala River Wheatfield Fork since 2004 DEIR scoping. No field surveys for bullfrogs in the project area or vicinity were cited in the EIR. The DEIR failed to quantify irrigation ponds in project vicinity, the distance of neighboring reservoirs or the proposed reservoir from potential riparian dispersal corridors or potential bullfrog- impacted habitats. I personally observed up to 45+ bullfrog tadpoles in one Wheatfield Fork channel pool in July 2009, and detected them downstream as far as Valley Crossing for the first time in 2009.

Unlike most of the last decade, bullfrogs are now (following 2 years of low winter river flows) frequent in pools and slow-flow channels throughout Wheatfield Fork reaches below Annapolis vineyards. Given their life-cycle intolerance of intermittent or seasonal wetland conditions, and the 2008 dewatering of the Wheatfield Fork below the Annapolis vineyard district, this indicates potential significant refugial habitat in artificial off-channel ponds such as vineyard reservoirs.

Indirect and cumulative impacts of fungicide, herbicide, pesticide transport and fate on native amphibians, fish, and prey base (aquatic invertebrates). Potentially significant cumulative and indirect impacts disregarded with no scientific evidence or argument. The DEIR lacks quantitative estimates of types of pesticides used in Sonoma County vineyards and amounts applied, and seasonal timing of application – data essential to biologically meaningful impact analysis. Table 3.8-2 merely identifies potential pesticide types, not quantities, relative application rates, or timing. The DEIR disregards most recent available UC Davis statewide database on pesticide use by crop and county (Sonoma County grapes; <http://www.ipm.ucdavis.edu/PUSE/2000/sn00-sp.02.html#grapes>) which quantifies following the insecticides, fungicides, herbicides, and soil fumigant/sterilants as the the most abundantly used pesticides applied to Sonoma County grapes in 2000, the most recent year for which data are available: dichloropropene, benomyl, cyprodinil, glyphosate, mancozeb, methyl bromide, oxyfluorfen, and petroleum distillates, many of which are known to have moderate to high ecotoxicity to fish, amphibians, and aquatic invertebrates (<http://extoxnet.orst.edu/>) and are known to disperse away from agricultural application areas (Gilliom et al. 2007).

The DEIR disregards scientific literature on transport and fate of agricultural pesticides in adjacent streams, and analysis of persistence, transport, fate of pesticides known to be used in vineyard conversion and operation. It retreats to speculative and nonscientific argument that compliance with pesticide labels by qualified personnel (all irrelevant to ecotoxicity from actual usage) eliminates ecotoxicity risk of pesticides, contrary to best available scientific evidence (USGS national study of pesticide and water quality, Gilliom et al. 2007). Strong evidence exists for ecotoxicity of surfactants (POEA used with glyphosate) and pesticide mixtures, especially fungicides used on Sonoma Co grapes. The impacts of drift or runoff from glyphosate formulations with POEA surfactants in non-target aquatic habitats can be severe for amphibians (Relyea 2005) and phytoplankton and periphyton communities at the base of the aquatic food webs (Perez et al. 2007). The DEIR fails to utilize the best available scientific evidence on this issue, available in the peer-reviewed scientific literature. It instead asserts an biologically unsubstantiated hypothesis (in fact contrary to published scientific evidence reviewed by USGS, Gilliom et al. 2007) that compliance with pesticide label use by “qualified” individuals will result in no significant impacts to nontarget aquatic habitats.

The DEIR fails to consider long-term changes in weed and pathogen challenges to Annapolis vineyards and pesticide responses. The cumulative impact of the project’s contribution to the pesticide load associated with spread of vineyards in the Wheatfield Fork watershed is not quantitatively analyzed or estimated. The DEIR fails to analyze wildlife ecotoxicity impacts of atypical pesticide treatment associated with “emergency” outbreaks of

new high threat pest species or range extensions of existing ones like glassy-winged sharpshooter, merely dismissing them, without evidence, as unlikely to occur, and failing to analyze the risk or impact of pesticide response to their potential invasion of the project vicinity.

Patchett Creek aquatic and amphibian species of concern (endemic Gualala Roach, western pond turtle, foothill yellow-legged frog). The DEIR underestimates the potential for potentially significant multiple cumulative impacts on fish and amphibians, and underestimates the likelihood of occurrence of special-status species. Pacific/northwest pond turtles occurred in the adjacent reaches of the Wheatfield Fork (basking adults) regularly during the last decade, and juveniles and adults have been detected in nearby tributaries Fuller Creek and Buckeye Creek (personal observation; unpublished data). Gualala roach occur consistently in all blue-line streams tributary to the lower Gualala River. The DEIR has identified foothill yellow-legged frogs in the study area, but failed to detect pond turtles, which require much more survey effort and time. The DEIR provided no adequate survey data (with sufficient survey effort for detection) despite nearly 5 yr since the NOP; the DEIR relies primarily on outdated records and database reports to infer weak evidence for likelihood of current species occurrence.

These species may be affected by winter/spring-season herbicide applications and transport, increased bullfrog invasion and predation pressure due to permanent irrigation pond habitat (see above), increased peak flow, and groundwater exploitation (reduction in baseflow) during critical drought years when reservoir supplies fail. DEIR states suitable persistent summer pool habitat exists. The DEIR disregards sensitivity of frogs to POEA (surfactant with high aquatic ecotoxicity) in herbicide formulations, bullfrogs as disease vectors and predation risk. The DEIR disregards future potential significant groundwater drawdown impacts on fish and amphibians due to redirection of designated “domestic” well use for replenishing unfilled reservoirs in multiple critical drought years. The DEIR provides no reason why proposed or future landowners would not redirect domestic well use towards supplemental filling of reservoirs during prolonged droughts.

Vegetation and setting – ethnobotanical (cultural) and regional significance of plant community above individual species level: The DEIR without evidence or analysis attributes the vegetation at the site to historic settlement land uses alone, and disregards the legacy of antecedent aboriginal vegetation management associated with the very extensive recorded village site. The DEIR disregards the anomalous and correlated concentration within and around the site of economically important plants to Kashaya (Pomo in general) including dominant oak stands (including species otherwise scarce in N Coast mixed coniferous forest), corresponding with concentrated distribution of an endemic manzanita and grassland containing valued textile plants (rhizomatous sedges, rushes) otherwise scarce in Annapolis. The integrity of the distinctive mature oak, grassland and manzanita scrub in the vicinity of the village site, which have either persisted or regenerated in modern conditions, would be subject to significant impacts due to agricultural conversion that permanently eliminates soil seed banks. The DEIR failed to assess impacts to the large-scale structure and integrity of

remnant vegetation patterns and composition that may reflect the prehistoric anthropogenic influence with archaeological significance.

Annapolis manzanita and thin-leaved horkelia mitigation: Both species are successional elements of grassland and scrub communities that must either be maintained by periodic grazing and burning (or equivalent removal of dominant forest trees), or suffer high risk of becoming displaced by Douglas fir and associated forest tree species. The fencing proposed for reserves will accelerate succession by excluding herbivores. The size of the reserves does not provide for population age-structure or recruitment and turnover over time; they are botanical gardens rather than biological reserves. The proposed mitigation will provide only short-term and nominal conservation of these special-status species. The protection design is counterproductive for the objectives, and thus the mitigation is inadequate.

Regionally rare species and community diversity detected, subject to significant impacts without mitigation: Plant surveys provide no information on distribution, frequency or abundance, and do not distinguish between isolated occurrences or patterns of locally elevated biodiversity (“hot spots”). The surveys provide merely a species list, with no information essential to assessment of impacts to biodiversity above the plant species level. Surveys report Phantom orchid, which is associated with mature forest communities and is rare south of Humboldt County. This is a significant occurrence, particularly if it is a viable population or associated with concentrations of other uncommon or rare plants and fungi.

Landscape-level habitat fragmentation impacts – cumulative impacts of Annapolis vineyard conversions. The DEIR narrowly assesses “wildlife corridors” while ignoring the larger-scale and more significant impact of forest habitat fragmentation due to existing, proposed vineyards, including the project and Preservation Ranch. The DEIR dismisses the significance of conversion to wildlife dispersal, without reference to evidence of large mammals with extensive home ranges as indicator species – notably mountain lion (present and controlled in Annapolis) and black bear. The DEIR thus fails to identify, assess, and mitigate habitat matrix fragmentation impacts to large mammals with large home ranges.

Wildlife impacts of bird netting over ripening grapes – The DEIR fails to identify, assess, or mitigate potentially significant direct and cumulative impacts of seasonal placement of bird netting over hundreds acres of vineyards during fruit ripening, an activity that has occurred annually at multiple vineyards in Annapolis. Bird netting poses a potential hazard to foraging migratory birds and avian predators (attracted to injured or trapped birds).

Northern spotted owl (NSO) – Despite scoping comments stressing and documenting the biological importance of indirect and cumulative impacts to the DEIR reduces impacts to the NSO due to habitat facilitation of non-native predator and competitor barred owls, the DEIR impact analysis persists in applying an arbitrarily narrow scope of direct “take” of individual birds (short-term timber harvest impact analysis) in the conversion footprint. The DEIR fails to address potentially significant long-term, indirect and cumulative impacts of landscape-level changes that facilitate invasion by non-native predator and competitor, barred owl, which has increased frequency in Annapolis. The DEIR

dismisses the suitability of habitat in the project area as important for NSO even for foraging, and dismisses the suitability of forested rural residential parcels to support NSO. I have observed two consecutive years of one to two NSO pairs holding apparent territories during the breeding season (repeated multiple call types over months) on my forested parcel in Annapolis, until barred owls appeared for the first time in 2008 as regular visitors or residents. The DEIR analysis is flawed because it ignores indirect and cumulative project impacts on long-term habitat suitability and maturation compared with the consequences of vineyard conversion. The DEIR does not even propose ongoing monitoring of the frequency of barred owls or spotted owls in the project vicinity to determine whether its assumptions are correct.

Wetland mitigation. The location of closely spaced seasonal wetlands adjacent to a potential drift source of fungicides and herbicides is likely to cause contamination of viable aquatic invertebrate and amphibian communities in constructed seasonal wetlands (artificial vernal pools), even if buffer zones are established (Battaglin et al. 2009). Battaglin et al. (2009) found evidence of harmful levels of 28 pesticides and their degradation products, including glyphosate, in buffered or otherwise “protected” vernal pools near herbicide treatment areas. The impacts of drift or runoff from glyphosate formulations with POEA surfactants in non-target seasonal wetlands can be severe for amphibians (Relyea 2005) and phytoplankton and periphyton communities at the base of the aquatic food webs (Perez et al. 2007). The proposed wetland compensatory mitigation ignores and grossly underestimates the feasibility constraints of locating seasonal wetlands next to agricultural pesticide treatment areas, and ignores current scientific literature on the risks of pesticides on seasonal wetland ecology.

The wetland mitigation proposal also fails to assess the likelihood of reestablishing native seasonal wetland species diversity in constructed seasonal wetlands that are subject to invasion by local dominant non-native pennyroyal (*Mentha pulegium*) from locally abundant seed sources and widespread native nutsedge species (*Cyperus* spp.).

Errata – The botanical surveys omitted *Cytisus scoparius*, an important noxious weed, or misidentified it with *Genista monspesulana* that also occurs on the site.

Additional EIR defects

Frost protection and water use assumptions. The DEIR underestimates impacts of frost protection measures by assuming that none are required for this location (DEIR p. 2-23). This is speculation inconsistent with observed practices of the nearest vineyards on slopes below Annapolis Road on similar slopes and elevation ranges (Putnam Vineyard): in April 2009, Putnam Vineyard ran propane fans during at least four late season April frosts from 10 p.m. to 9 a.m., despite cold air drainage to the Wheatfield Fork and adjacent tributaries. Late frosts (March-April) after grape bud break have been routine occurrences in the last decade in the project vicinity, and frost impacts are apparently concentrated on slopes below Annapolis Road (versus above the road). The DEIR appears to have failed in diligent assessment of frost protection by investigating practices

of existing neighboring vineyards at comparable topographic positions and elevation ranges, substituting speculation for investigation.

If the project does not propose installation of propane fans (with noise impacts), and is faced with frost impacts, it is reasonable to assume irrigation would be used to mitigate economically significant frost injury. Thus, the DEIR either underestimates noise impacts or water balance and associated hydrologic and aquatic ecological impacts.

Non-quantitative fertilizer and nutrient impact assessment: The DEIR addresses nitrogen and other nutrient loading of the environment by merely stating that fertilizer addition would be done ‘as needed’ (DEIR p. 2-25). The DEIR fails to estimate long-term individual project or cumulative watershed agricultural nitrogen loading of Patchett Creek or the Wheatfield Fork by analyzing fertilizer application data from comparable new or established vineyards on Goldridge soils in Annapolis or elsewhere in Sonoma County. The DEIR circumvents meaningful analytic assessment (and mitigation) of a potentially significant cumulative impact on water quality. Goldridge soils are transmissive sandy silts with high potential for leaching nitrates.

Global warming/Greenhouse gas (GHG) and carbon balance impacts (direct and cumulative) of proposed agricultural conversion of forestland: The DEIR inaccurately characterizes vineyards as net carbon-sequestering cropping systems (italicized for emphasis):

As discussed above, the project involves the implementation of cover crops and no-till practices. Furthermore, grape vines are a woody plant that would absorb carbon. At this time a numerical model for analyzing the carbon sequestration of vineyards is not available. However, the carbon sequestration rates for the vineyard area are likely to be on the higher side of the estimates shown in Table 4-3 because carbon sequestration in woody plants such as vines would be higher than in grasses. DEIR p. 4-13...sequestration]). Therefore, except for the low carbon sequestration estimate, the project site would continue to sequester more carbon dioxide than vineyard activities would emit. Under the worst-case scenario the project would result in net emissions of 83.6 metric tons of carbon dioxide equivalents. (DEIR p. 4-15).

This conclusion and analysis of Table 4-3 ignore the “hidden” net carbon costs of nitrogen fertilizer and release of nitrogenous greenhouse gases, as well as the fate of woody pruned biomass; they also ignore the best available comprehensive scientific models of California agricultural C sequestration from the Carnegie Institute and Stanford University (Kroodsma and Field 2006). The overall (net) carbon costs of California agriculture offset gains from C sequestration, and unless carbon in all wood pruned from vineyards is reincorporated in soil or converted to biofuel, even perennial agricultural systems in California will fail to realize their carbon sequestration potential and offset carbon and GHG emissions (Kroodsma and Field 2006). In any case, vineyard conversion from forestland (not annual cropland) will result in significant long-term net

loss of carbon sequestration potential *relative to vineyard-displaced north coast coniferous forest* with extremely high long-term biomass and soil carbon sequestration potential. The loss of carbon sequestration potential is not even nominally mitigated by a forest protection offset following Sonoma County vineyard conversion policies. The DEIRs conclusions are misleading and inaccurate regarding GHG and carbon sequestration potential, and they require rigorous scientific peer review to correct flawed or omitted assumptions in modeling.

Conclusions and recommendations

1. The DEIR contains multiple fundamental defects in CEQA compliance that necessitate recirculation. The egregious underestimation of cultural (archaeological) resource distribution, significance, sensitivity, and vulnerability is alone sufficient to trigger recirculation requirements. The DEIR's alternative analysis cannot be meaningful without a comprehensive inventory of the Pomo village site complex and evaluation of the site as a whole as an archaeological district with special protected status – a very different significance criterion than was evaluated.
2. The DEIR utilized a very arbitrary range of site-specific studies to address deficiencies in the antecedent Mitigated Negative Declaration. The recirculated DEIR should prepare site-specific studies to empirically test doubtful (comparative) conclusions about key hydrologic impacts, indirect and cumulative impacts on fish and other aquatic biological resources
3. The recirculated DEIR should propose either adequate mitigation for significant impacts that were not adequately assessed (or omitted entirely) in the DEIR, or propose basic project modifications to avoid impacts that cannot be adequately mitigated.
4. The alternatives analysis should be fundamentally revised to analyze reduced project alternatives based on actual feasible vineyard sizes (adjacent vineyard basis) and the original 2001 conversion proposal. In addition, the alternatives analysis should fully consider constraints (impact avoidance) of archaeological resources on the site not as incremental individual artifacts, but as a whole (district-level impact avoidance). The alternatives analysis should re-evaluate contemporary market, economic, and vineyard land availability conditions, given the precipitous change in these conditions since the 2004 NOP.

Respectfully submitted,



Peter R. Baye, Ph.D.

Literature Cited

- Battaglin William A., Karen C. Rice, Michael J. Focazio, Sue Salmons, Robert X. Barry. (2009) The occurrence of glyphosate, atrazine, and other pesticides in vernal pools and adjacent streams in Washington, DC, Maryland, Iowa, and Wyoming, 2005–2006. *Environmental Monitoring and Assessment* **155**:1-4, 281-307
- Battaglin, William A., Dana W. Kolpin, Elizabeth A. Scribner , Kathryn M. Kuivila, Mark W. Sandstrom. 2005. Glyphosate, other herbicides, and transformation products in Midwestern streams. Paper No. 04024 of the *Journal of the American Water Resources Association* (JAWRA) April 2005
- Robert J. Gilliom, Jack E. Barbash, Charles G. Crawford, Pixie A. Hamilton, Jeffrey D. Martin, Naomi Nakagaki, Lisa H. Nowell, Jonathan C. Scott, Paul E. Stackelberg, Gail P. Thelin, and David M. Wolock. 2007 (revised edition). **The Quality of Our Nation's Waters: Pesticides in the Nation's Streams and Ground Water, 1992–2001**. Circular 1291 U.S.
- Kroodsma, D.A. and C.B. Field. 2006. Carbon sequestration in California agriculture, 1980-2000. *Ecological Applications* 16:1975-1985
- McLaughlin, K, S. Hobbie, W.M. Post. 2006. Conversion from agriculture to grassland builds soil organic matter on decadal timescales. *Ecological Applications* 16:143-153.
- Relyea, R.A. 2005. The impact of insecticides and herbicides on the biodiversity and productivity of aquatic communities. *Ecological Applications* 15:618-627