2. REVISIONS TO THE DEIR TEXT

2 REVISIONS TO THE DEIR TEXT

2.0 INTRODUCTION

Chapter 2 presents all of the revisions made to the Draft Environmental Impact Report (DEIR) in response to comments received or minor staff edits. It should be noted that the following revisions do not change the intent or content of the analysis or effectiveness of the mitigation measures presented in the DEIR.

2.1 DESCRIPTION OF CHANGES

New text is double "underlined", and deleted text is ~~"struck through"~~. Text changes are presented in the page order in which they appear within the DEIR.

1.0 INTRODUCTION, SCOPE, AND SUMMARY OF EIR

Chapter 1 of the DEIR is hereby revised on page 1-12 for clarification purposes, as follows:

> **Chapter ~~5~~6 – Alternatives Analysis**
> Describes the alternatives to the proposed project, their respective environmental effects, and a determination of the environmentally superior alternative.
>
> **Summary of the Project Alternatives**
>
> CEQA Guidelines §15126.6 directs that an EIR shall describe a range of reasonable alternatives to the proposed project, or to the location of the proposed project, which would feasibly attain most of the basic objectives of the project while avoiding or substantially reducing any of the significant effects of the project. This analysis must also evaluate the comparative merits of the alternatives. The following summarizes the alternatives which are evaluated in this EIR. A complete analysis of alternatives is provided in Chapter ~~5~~6.

The modification is for clarification purposes only and does not change the conclusions of the DEIR.

2.0 PROJECT DESCRIPTION

As discussed in the Introduction chapter to this Final EIR, since the release of the DEIR for public review on May 29, 2009, the Applicant, in coordination with CAL FIRE, has revised the description of the project for which approval is being sought. These changes were carefully made by the project team primarily as a result of the input on the project by members of the community as well as responsible agencies. As is demonstrated in the revised section of the

Project Description chapter of the DEIR, the carefully selected changes to the Vineyard Plan serve to further refine the design of the overall project, resulting in an even greater level of protection of natural resources, though the project's impacts to natural resources, including biological, cultural, and hydrological resources, were adequately determined to be less-than-significant in the Fairfax Conversion DEIR with implementation of all identified mitigation measures. In no instance, have the changes resulted in the identification of new significant environmental impacts, or a substantial increase in the severity of an environmental impact, which are the clear grounds for recirculation of the EIR.

Page 2-8 of Chapter 2, *Project Description*, of the DEIR is hereby revised to reflect the changes in the Vineyard Plan since the release of the DEIR. In addition, Figures 2-6 through 2-11 of the Project Description are hereby deleted and replaced with the following updated Vineyard Plan exhibit:

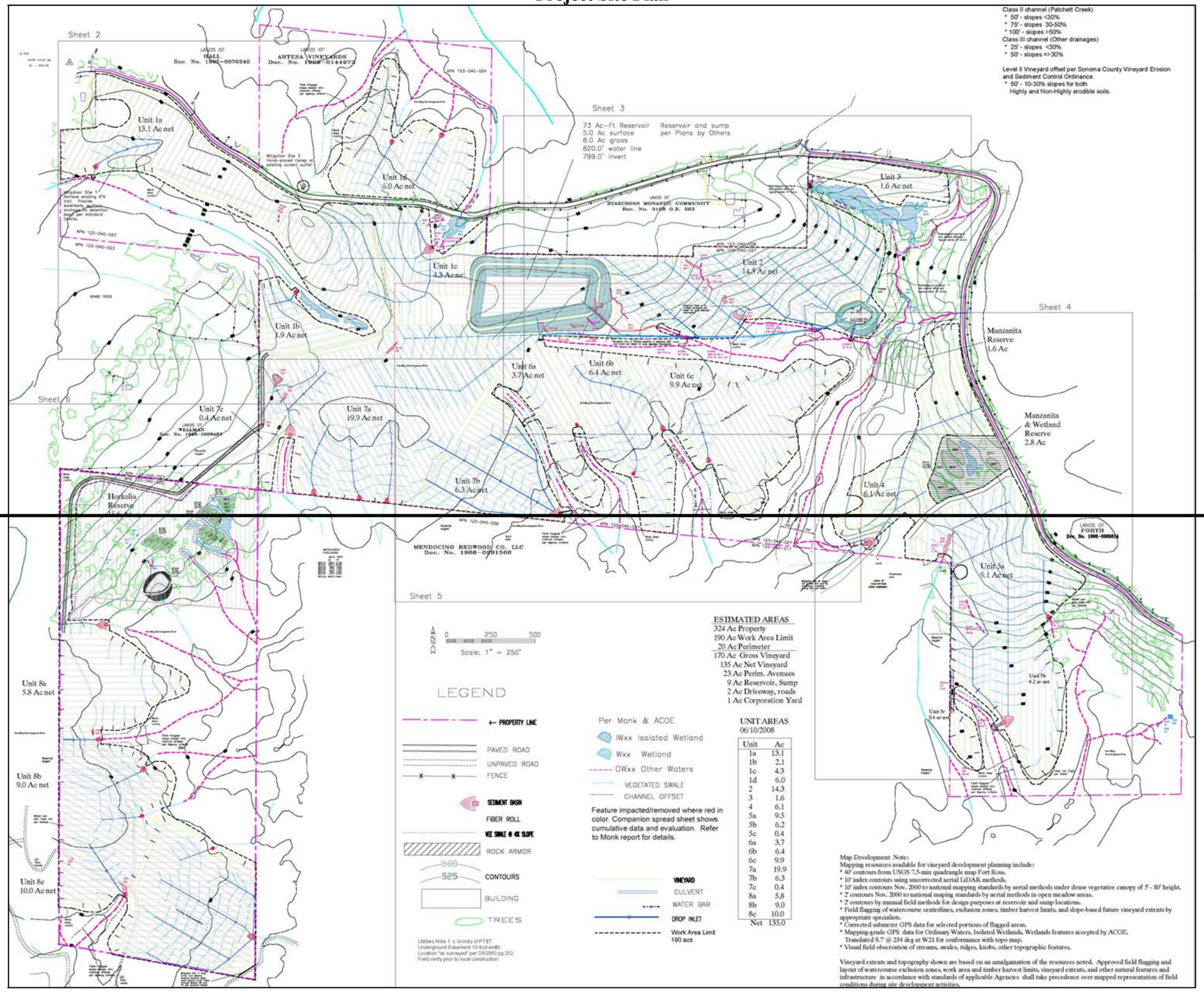
Project Description

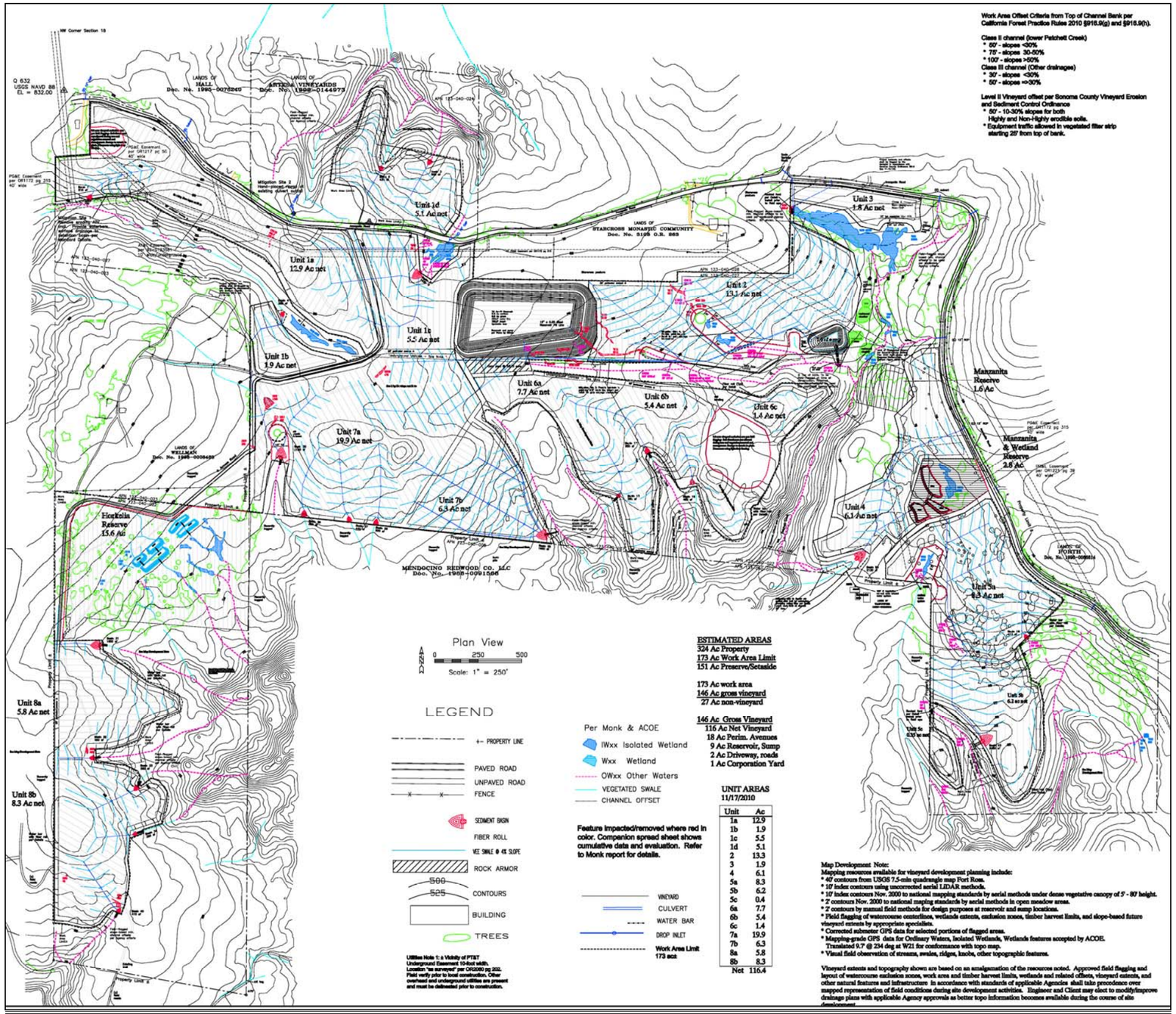
The project, as currently proposed, includes the issuance of a Timberland Conversion Permit (TCP), which would exempt ~~171~~154 acres of a 324-acre property from Forest Practice Act tree stocking (tree planting) requirements, in order to facilitate the development of a ~~170~~146-acre vineyard site (See Figure 2-6, Project Site Plan~~. Please note that due to the size of the proposed project the details of Figure 2-6 are somewhat difficult to read; Figure 2-6 has been provided to show the entire project. Details may be more easily read and identified in Figures 2-7 through 2-11.~~) In addition, as part of the vineyard development, 19 acres would be converted from meadow/orchard to vineyard uses; the rest of the project site is existing timberland. The total developed area would be ~~190~~173 acres.

The ~~135~~116 net acres of vineyard would be composed of eight units, which are composed of up to four sub-units (See Table 2-1 and Figure~~s~~ 2-6 ~~through 2-11~~). In addition, five protected areas that would be protected from conversion activities are located within the project boundaries. The protected areas include: the 15.6-acre Horkelia Reserve; the 2.8-acre Manzanita – Wetland Reserve; and the 1.6-acre Manzanita Reserve; as well as protected archaeological sites. As indicated by the names, the various sites are intended to protect sensitive archeological, wetland, and biological resources sites.

In addition, as illustrated on the Vineyard Plan (See Figure 2-6), the applicant would set aside approximately 151 forested acres via deed restrictions on the site, part of which would preserve a wildlife corridor running the length of Patchett Creek on the property. In summary, approximately 46 percent or nearly one-half of the project site will be preserved permanently to protect biological resources. It should be noted that the permanent deed restriction will prohibit timber harvesting within the restricted areas and these areas will be fenced and retained as open space and wildlife habitat. The only operations proposed within the deed-

Figure 2-6
Project Site Plan




Work Area Offset Criteria from Top of Channel Bank per California Forest Practice Rules 2010 §916.9(g) and §916.9(h).
Class II channel (lower Patchett Creek)
* 50' - slopes <30%
* 75' - slopes 30-50%
* 100' - slopes >50%
Class III channel (Other drainages)
* 30' - slopes <30%
* 50' - slopes =>30%
Level II Vineyard offset per Sonoma County Vineyard Erosion and Sediment Control Ordinance
* 50' - 10-30% slopes for both Highly and Non-Highly erodible soils.
* Equipment traffic allowed in vegetated filter strip starting 20' from top of bank.
Unit 1a 12.9 Ac net
Unit 1b 1.9 Ac net
Unit 1c 5.5 Ac net
Unit 1d 5.1 Ac net
Unit 2 13.3 Ac net
Unit 3 1.9 Ac net
Unit 4 6.1 Ac net
Unit 5a 8.3 Ac net
Unit 5b 6.2 Ac net
Unit 5c 0.4 Ac net
Unit 6a 7.7 Ac net
Unit 6b 5.4 Ac net
Unit 6c 1.4 Ac net
Unit 7a 19.9 Ac net
Unit 7b 6.3 Ac net
Unit 8a 5.8 Ac net
Unit 8b 8.3 Ac net
Manzanita Reserve 1.6 Ac
Manzanita & Wetland Reserve 2.8 Ac
Hopkins Reserve 15.6 Ac
Plan View
Scale: 1" = 250'
LEGEND
PROPERTY LINE
PAVED ROAD
UNPAVED ROAD
FENCE
SEDIMENT BASIN
FIBER ROLL
VEE SWALE @ 4% SLOPE
ROCK ARMOR
CONTOURS
BUILDING
TREES
Per Monk & ACOE
IWxx Isolated Wetland
Wxx Wetland
OWxx Other Waters
VEGETATED SWALE
CHANNEL OFFSET
Feature impacted/removed where red in color. Companion spread sheet shows cumulative data and evaluation. Refer to Monk report for details.
VINEYARD
CULVERT
WATER BAR
DROP INLET
Work Area Limit 173 ac±
ESTIMATED AREAS
324 Ac Property
173 Ac Work Area Limit
151 Ac Preserve/Setaside
173 Ac work area
146 Ac gross vineyard
27 Ac non-vineyard
146 Ac Gross Vineyard
116 Ac Net Vineyard
18 Ac Perim. Avenues
9 Ac Reservoir, Sump
2 Ac Driveway, roads
1 Ac Corporation Yard
UNIT AREAS 11/17/2010
Unit Ac
1a 12.9
1b 1.9
1c 5.5
1d 5.1
2 13.3
3 1.9
4 6.1
5a 8.3
5b 6.2
5c 0.4
6a 7.7
6b 5.4
6c 1.4
7a 19.9
7b 6.3
8a 5.8
8b 8.3
Net 116.4
Map Development Note:
Mapping resources available for vineyard development planning include:
* 40' contours from USGS 7.5-min quadrangle map Fort Ross.
* 10' index contours using uncorrected aerial LIDAR methods.
* 10' index contours Nov. 2000 to national mapping standards by aerial methods under dense vegetative canopy of 5' - 80' height.
* 2' contours Nov. 2000 to national mapping standards by aerial methods in open meadow areas.
* 2' contours by manual field methods for design purposes at reservoir and sump locations.
* Field flagging of watercourse centerlines, wetlands extents, exclusion zones, timber harvest limits, and slope-based future vineyard extents by appropriate specialists.
* Corrected submeter GPS data for selected portions of flagged areas.
* Mapping-grade GPS data for Ordinary Waters, Isolated Wetlands, Wetlands features accepted by ACOE. Translated 9.7' @ 234 deg at W21 for conformance with topo map.
* Visual field observation of streams, swales, ridges, knobs, other topographic features.
Vineyard extents and topography shown are based on an amalgamation of the resources noted. Approved field flagging and layout of watercourse exclusion zones, work area and timber harvest limits, wetlands and related offsets, vineyard extents, and other natural features and infrastructure in accordance with standards of applicable Agencies shall take precedence over mapped representation of field conditions during site development activities. Engineer and Client may elect to modify/improve drainage plans with applicable Agency approvals as better topo information becomes available during the course of site development.

restricted areas will be the construction of mitigation wetlands, planting of riparian habitat and placement of large woody debris following the timber harvest on the conversion areas.

In addition, Table 2-1, Vineyard Unit Areas, on page 2-16 of the Project Description chapter is hereby revised as follows to reflect the latest Vineyard Plan (see Figure 1-1 of this Final EIR).

Table 2-1
Vineyard Unit Areas

Unit	Acres
1a	~~13.1~~12.9
1b	~~2.1~~1.9
1c	~~4.3~~5.5
1d	~~6.0~~5.1
2	~~14.3~~13.3
3	1.~~6~~1.9
4	6.1
5a	~~9.5~~8.3
5b	6.2
5c	0.4
6a	~~3.7~~7.7
6b	~~6.4~~5.4
6c	~~9.9~~1.4
7a	19.9
7b	6.3
~~7e~~	~~0.4~~
8a	5.8
8b	~~9.0~~8.3
~~8e~~	~~10.0~~
Net Vineyard Area	**~~135~~116.4 Ac**
Corporation Yard	1Ac
Reservoir and Sump	9 Ac
Perimeter Avenues	~~23~~18 Ac
Driveway and Roads	2 Ac
Perimeter Grading, Internal Avenues, Basins, Edges	~~20~~27 Ac
Total Project Area	**~~190~~173* Ac**
CONSERVATION ~~EASEMENT~~AREA Horkelia, manzanita, wetland preserves	**20.0**
Other forest/riparian reserve acreage	**131**
TOTAL Reserve Area	**151**
*** Total does not equal 173.4 because corp yard is now actually less than 1 acre. It has been rounded up in this table.**	

The list and description of erosion mitigation sites on pages 2-9 and 2-18 of the *Project Description* chapter and illustrated in Figure 2-12 of said chapter are hereby revised given the field observations made by project team and agency staff during the pre-harvest inspection (PHI) on-site. Specifically, erosion mitigation site 7 was determined to be located on an adjacent parcel and not in the project area during the PHI; therefore, the originally proposed seventh erosion mitigation site is not available for the proposed project. In addition, the temporary truck crossings reflected at Points 8 and 9 of Figure 2-12 have been removed from the plan, as also reflected in the updated THP attached to this Final EIR as Appendix C, due to archaeological observations made during the pre-harvest inspection. As a result, the seventh erosion mitigation site is hereby deleted from pages 2-9, as well as Figure 2-12, of the *Project Description* chapter of the DEIR, as follows:

> The proposed project would mitigate ~~seven~~ <u>six</u> existing sedimentation sites that have been identified on the project site. The sediment yield under project conditions would be reduced owing to design mitigations and other mitigations to repair and prevent gully erosion on the project site. The erosion control measures incorporated into the proposed project include:
>
> 1. Elimination of a degraded ATV trail under power lines caused by unauthorized site users. The trail would be redeveloped as vineyard and drainage within Unit 1.
> 2. Installation of a rock armored outfall on an Annapolis Road culvert outside the vineyard. Hand placed rock armor will mitigate and prevent further enlargement of a small channel scour area in an area with negligible tributary area from roadside drainage.
> 3. Seepage control in abandoned skid road that has eroded and formed a semi-naturalized channel. A subsurface intercept drain will be placed in or near the perimeter vineyard avenue to minimize saturation-based gully enlargement below the reservoir site.
> 4. Groundwater and seepage control in an existing gully. A subsurface intercept drain will be placed in or near the perimeter vineyard avenue to minimize saturation-based gully enlargement downslope in a normally dry Ordinary Water reach below Unit 2.
> 5. Groundwater and seepage control in a second existing gully. A subsurface intercept drain will be placed in or near the perimeter vineyard avenue to minimize saturation-based gully enlargement downslope in a normally dry Ordinary Water reach below Unit 2.
> 6. An abandoned skid trail would be repaired below Unit 5. An overgrown and gullied skid trail would be shaped and outsloped. Surface water would be diverted from entering the site by shaping and periodic rolling dips or water bars installed to prevent accumulation of surface runoff on the trail.
> 7. ~~Roadside ditch dewatering and armoring. Surface runoff from the southeast corner of Unit 8 would be routed through detention basins to a more appropriate swale location. An existing roadside ditch would be armored.~~

In addition, Comment Points 8 and 9 are hereby deleted from page 2-18, as well as Figure 2-12, of the *Project Description* chapter of the DEIR, as follows:

> Comment points labeled "1"through "~~7~~6" in Figure 2-12, below, indicate the location of areas of erosion where water draining from the open meadows and old orchard area enters a Class III watercourse. Previous operations have altered the natural drainage patterns of the area resulting in the erosion that is occurring. The erosion areas will be improved through the implementation of the Erosion Control Plan, which details measures that will disperse runoff from the area. Temporary erosion control measures would be utilized around the work areas, and timber harvesting or vineyard clearing operations would not occur on slopes over 30 percent or on other unstable areas. Timber harvesting access would be provided primarily via the existing seasonal roads; these roads would require minimal grading for maintenance purposes during timber hauling operations. The installation of three temporary roads would be required for timber harvesting operations. The roads would be constructed on stable slopes of less than 15 percent, and would require a minimal amount of excavation. The roads would not be located either wholly or partially within any WLPZ. ~~It should also be noted that two temporary truck road crossings exist on Class III watercourses within the project area; these are shown in Figure 2-12 at the points labeled "8" and "9." These crossings were used during previous operations and soil/fill material was left in the watercourse channel. A temporary truck road will cross at these points and the watercourse crossings will be removed as a part of timber operations. Fill material that exists in the watercourse channel will be removed to form a channel that is as close as feasible to the natural watercourse grade and orientation, and is wider than the existing channel in compliance with Forest Practice Rule 14 CCR 923.3(d)(1) such that stormwater velocities and potentially resulting erosion is reduced. The excavated material and any resulting cut bank will be sloped back from the channel and stabilized to prevent slumping and to minimize soil erosion. The disturbed soil on the approaches to the crossing will be seeded and mulched. The operations will be completed prior to October 15th of the first timber operations season.~~ With the exception of the two permanent roads indicated on Figure 2-12, which provide access to neighboring residences, all existing seasonal roads, tractor roads, and landings located within the project area would be abandoned following completion of timber harvest operations. Vehicle access to the vineyard units will be via encroachments at the existing permanent roads that access the vineyard units and then along "vineyard avenues" within the vineyard units. Finally, two ephemeral channels would be modified to allow for an all-season ford stream crossing; these are shown in Figure 2-12 at the points labeled "10" and "11." While rock would be used to construct these crossings, it would be installed in contour with the channel, assuring that the original flow capacity in the channel is not restricted in any manner or fashion.

~~Figure 2-12~~
~~Timberland Conversion Operations Map~~

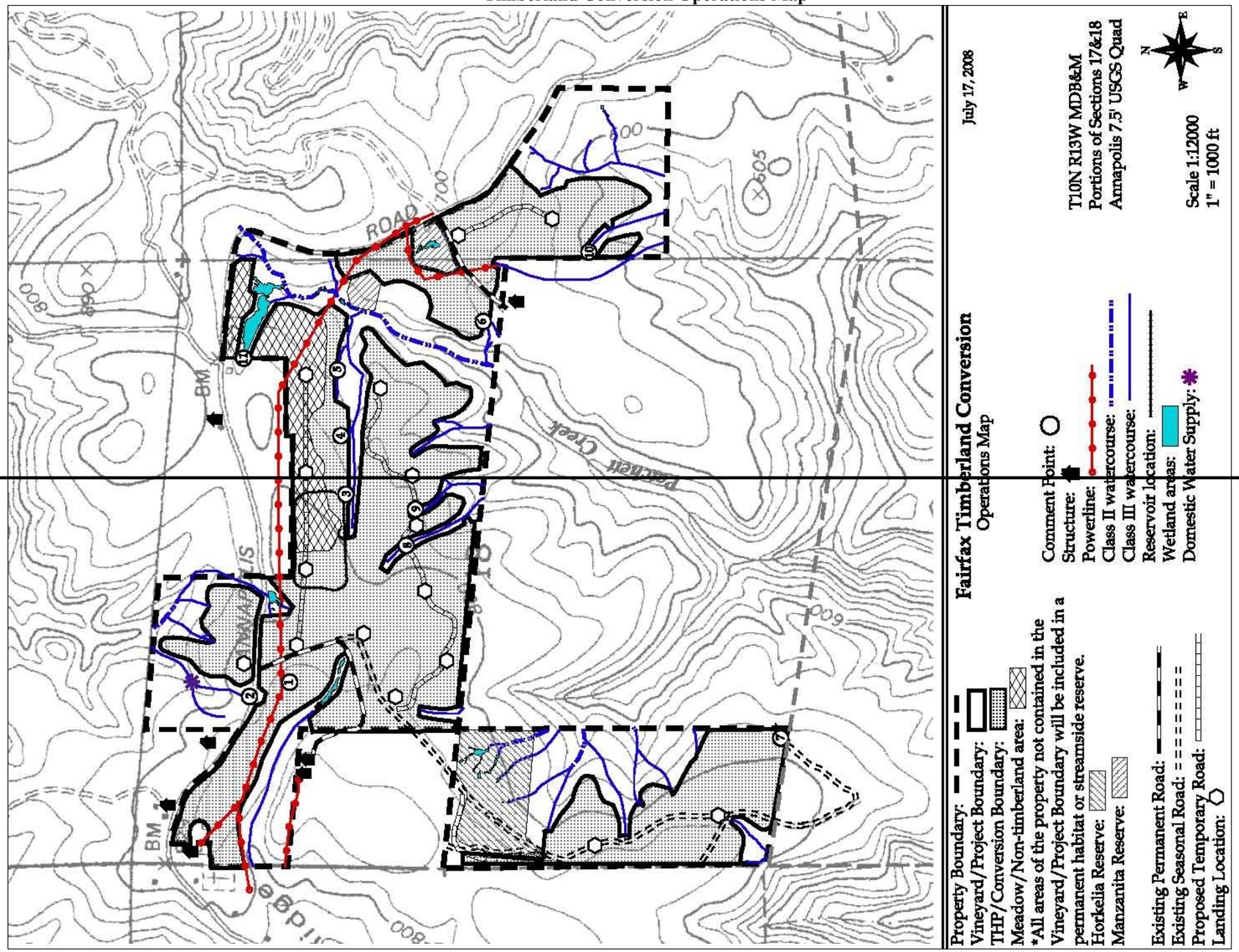
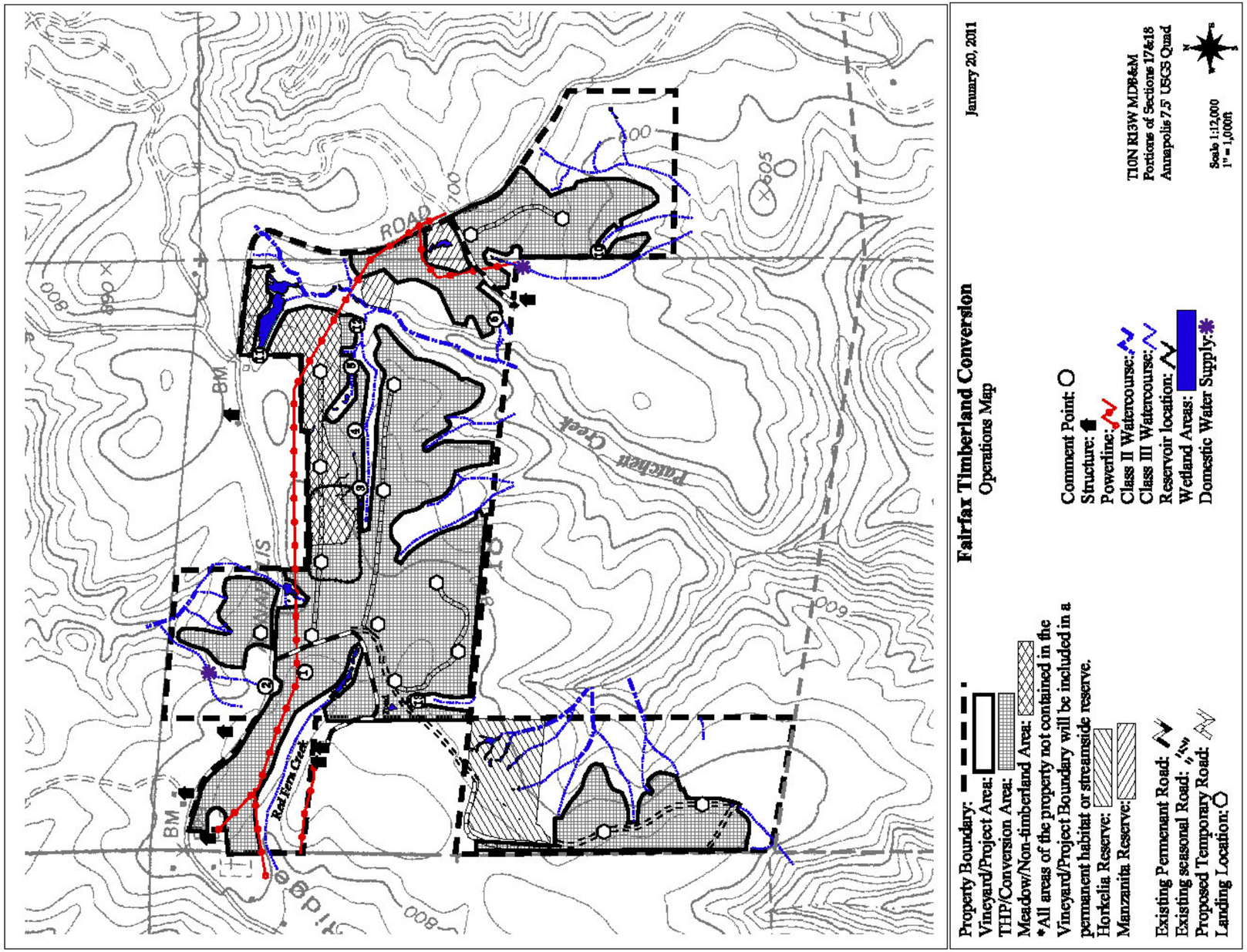


Figure 2-12
Timberland Conversion Operations Map



It is important to note that the removal of erosion mitigation site 7 has now been accounted for in the updated Erosion Analysis for the Fairfax Conversion project, dated February 2011, and attached to this Final EIR as Appendix A. The changes to the Erosion Analysis as a result of the removal of the seventh erosion mitigation site, as well as the reduction in the vineyard net acreage, as described above, are presented below in this Errata chapter in Section 3.7, *Hydrology and Water Quality*.

Page 2-19 of the DEIR is hereby revised to add the following text at the end of "Phase III – Reservoir Installation" (see Response to Comment 10-7):

> Site development subject to ministerial County Grading and Drainage permitting will be undertaken for construction of the reservoir, sump, vineyard drain lines, drainage basins, and related incidental aspects of the Erosion and Sediment Control Plan. Balanced cuts and fills will be used on site, with no import or export of material. Estimated earthwork volumes are +-74,000 cy for the reservoir, +-3,500 cy for the sump, and a few hundred cubic yards over approximately 30 additional sites for the detention basins.

The above adds grading details which do not change the analysis or conclusions of the DEIR.

Pages 2-26 and 2-27 in Chapter 2, *Project Description*, of the DEIR are hereby clarified as follows (see Response to Comment 4-29):

> Sonoma County
>
> - ~~Ministerial – Erosion Control Plan~~
> - Ministerial – Grading Drainage, and Erosion Control Plan ~~Permit~~
> - ~~Ministerial – Erosion Prevention and Dust Control Plan~~
> - ~~Ministerial – Conservation Easement Management Plan~~
> - ~~Ministerial – Paleontological and Archaeological Resource Preservation Plan~~
> - ~~Ministerial – Post-Construction Monitoring Plan~~
> - ~~Ministerial – Channel Erosion and Sedimentation Basin Monitoring Plan~~
> - ~~Ministerial – Agricultural Chemical Use and Storage Contingency Plan~~
> - ~~Ministerial – Construction Traffic Management Plan~~
> - Ministerial – Vineyard and Orchard Erosion Control Plan
> - Ministerial – Agricultural Building Exemption/Permit (if building constructed)
> - Ministerial – Well installation permit
> - Ministerial – Driveway encroachment permit

The above changes are for clarification purposes only and do not change the conclusions in the DEIR.

3.0 ENVIRONMENTAL SETTING, IMPACTS, AND MITIGATION

3.2 Land Use

For clarification purposes, the standards of significance on page 3.2-19 of the DEIR are hereby revised as follows (see Response to Comment 4-4):

Standards of Significance

A land use impact may be considered significant if any potential effects of the following conditions, or potential thereof, would result with the proposed project's implementation:

- Results in a land use which is inconsistent with existing State, County, or other applicable plans and policies; or
- Results in substantial potential for conflict as a result of incompatible land uses.

The above changes are for clarification purposes only and do not change the conclusions in the DEIR.

For clarification purposes, Impact Statement 3.2-1 has been revised as follows (see Response to Comment 4-18):

3.2-1 Compatibility with surrounding land uses.

~~The Sonoma County Right-to-Farm Ordinance was established to facilitate agricultural operations on agricultural lands by limiting the circumstances in which farming activities can be deemed a nuisance. Growing and harvesting of vine crops is an allowed use under the project site's existing zoning designation. Therefore, as the proposed project site is zoned for agricultural use, the Right-to-Farm Ordinance applies to farming activities that would take place on the project site under the proposed vineyard.~~

Because the Fairfax Conversion project is agricultural in nature, the proposed project is consistent with the General Plan land use and zoning designations for the project site. In addition, the Sonoma County General Plan emphasizes the need to conserve natural and agricultural resources in the County, and to encourage commercial development that does not include intensive urban development, which requires extensive infrastructure. As a result, because the surrounding uses are natural resource-related, the addition of approximately ~~135~~116 net acres of vineyards to the vicinity would be compatible with the surrounding General Plan land use designations, which are also Resources and Rural Development.

Even though the proposed uses are compatible with the site's General Plan designation ~~and is sanctioned by the Sonoma County Right-to-Farm Ordinance~~, the possibility exists that incompatibilities with adjacent uses could occur. The determination of compatibility of land uses typically relies on a general discussion of the types of adjacent uses to a proposed project and whether any sensitive receptors exist either on the adjacent properties or associated with the proposed project. Incompatibilities typically exist when uses such as residences, parks, churches, and schools are located adjacent to more disruptive uses such as heavy industrial, major transportation corridors, and regional commercial centers where noise and traffic levels may be high. The identification of incompatible uses occurs if one land use is anticipated to be disruptive of the existing or planned use of an adjacent property. The project site was utilized as an apple orchard and for sheep farming, but has remained fallow since approximately 1964. One vineyard is located adjacent to the project site's northeast border, and the general vicinity surrounding the project site includes areas that are in the process of being converted into vineyards.

The area southwest of the site is currently being used for timber production, while the area north of Annapolis Road is the site for the Starcross Monastic Community. Immediately west of the project property boundary is a rural residence, and southeast of the project site is a waste disposal site. The proposed project would generate air pollutants in both the construction and operations phases. Impacts to air quality are discussed in Chapter 3.3 of this DEIR, and all impacts are reduced to a less-than-significant level through the application of the required mitigation. The proposed project would primarily utilize Integrated Pest Management practices to control pests; however, when necessary, pesticides may be used. Impacts related to the use of pesticides are evaluated in Chapter 3.8 of this DEIR, and were found to be less-than-significant with implementation of mitigation measures. The proposed project would result in increases in truck traffic during the logging operations and during the harvest season. Impacts to traffic are discussed in Chapter 3.9 of this DEIR, and all impacts were found to be less-than-significant with implementation of mitigation measures. Logging and vineyard operations would increase the noise level beyond what is currently generated by the project site. Impacts related to noise are assessed in Chapter 3.10; all impacts related to noise were found to be less-than-significant with implementation of mitigation measures. During vineyard operations early morning harvesting activities could potentially generate light. Impacts to aesthetics are evaluated in Chapter 3.11 of the DEIR, and all impacts were found to be less-than-significant with implementation of mitigation measures. The DEIR contains extensive mitigation to ensure that the proposed project does not have a significant impact on adjacent land uses.

The proposed project use is consistent with the General Plan~~, is sanctioned by the Sonoma County Right-to-Farm Ordinance,~~ and all potential land uses compatibility impacts related to implementation of the proposed project would be mitigated to a less-than-significant level as demonstrated throughout the remaining technical chapters of the EIR. Consequently, the proposed project would result in ***less-than-significant*** impacts regarding conflicts with surrounding land uses.

Mitigation Measure(s)
None required.

The above changes to the DEIR do not alter the conclusions of the original analysis, which sufficiently determined that the project would not create incompatibilities with surrounding land uses once all mitigation measures are implemented.

3.3 Air Quality

Since the release of the DEIR for public review, CAL FIRE has identified the need for the following clarification to Mitigation Measure 3.3-1, so as to make the mitigation measure consistent with the language in the Project Description Chapter of the DEIR, which states that burning of slash will not be conducted on-site. As a result, Mitigation Measure 3.3-1 on page 3.3-12 of the DEIR has been revised as follows:

3.3-1 Prior to the issuance of a grading permit, the project contractor shall prepare an Erosion Prevention and Dust Control Plan. The plan shall be followed by the project's grading contractor and submitted for review and approval by the County Permit and Resource Management Department, which will be responsible for field verification of the plan during construction. The plan shall include the following control measures necessary for the proposed project:

- *Water all active and disturbed areas at least twice daily and more often during windy periods. Active areas adjacent to existing land uses shall be kept damp at all times, or shall be treated with non-toxic stabilizers or dust palliatives.*
- *Apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas.*
- *Limit traffic speeds on unpaved areas and roads to 15 mph.*
- ~~*Burning of cleared vegetation shall be conducted according to Regulation II – Open Burning, of the Northern Sonoma County APCD.*~~

The above change is for clarification purposes and does not change the conclusions of the DEIR.

3.4 Biological Resources

The boundaries on Figure 3.4-4 of the DEIR were inadvertently shifted to the north. Several other figures in the DEIR include the correct boundaries, such as Figures 3.2-1 and 3.4-1. A revised figure has been included in the Final EIR to include the correct project boundaries. The new figure does not change the analysis contained in the DEIR, which was based on the correct boundaries in all cases. As a result, Figure 3.4-4 of the DEIR is hereby corrected as shown on the following pages (see Response to Comment 4-16):

However, it is important to note that the actual preserve areas on the Fairfax Conversion project site have changed since the release of the DEIR as a result of various minor adjustments made in response to agency comments on the THP. The latest preserve areas are shown in Figure 1-1 of this Final EIR.

Table 3.4-3, *Special-Status Wildlife Species Potentially Occurring on the Project Site*, starting on page 3.4-31 of Chapter 3.4, *Biological Resources*, of the DEIR is hereby revised to provide more locational specifics for the Gualala roach (see Response to Comment 12-10).

Species	Status	Habitat	Closest Locations	Potential for Occurrence
Gualala roach *Lavinia symmetricus parvipinnus*	Fed: State: CSC Other:	Found only in the Gualala River.	Record for this species located ~~3.3 miles west of the project site (Occurrence No. 1).~~ Approximately 2 miles below the project site in the Upper Wheatfield Fork of the Gualala River (KRIS Gualala Database).	**None**. No suitable habitat for this species is present in Patchett Creek. This species was not detected during appropriately-timed surveys.

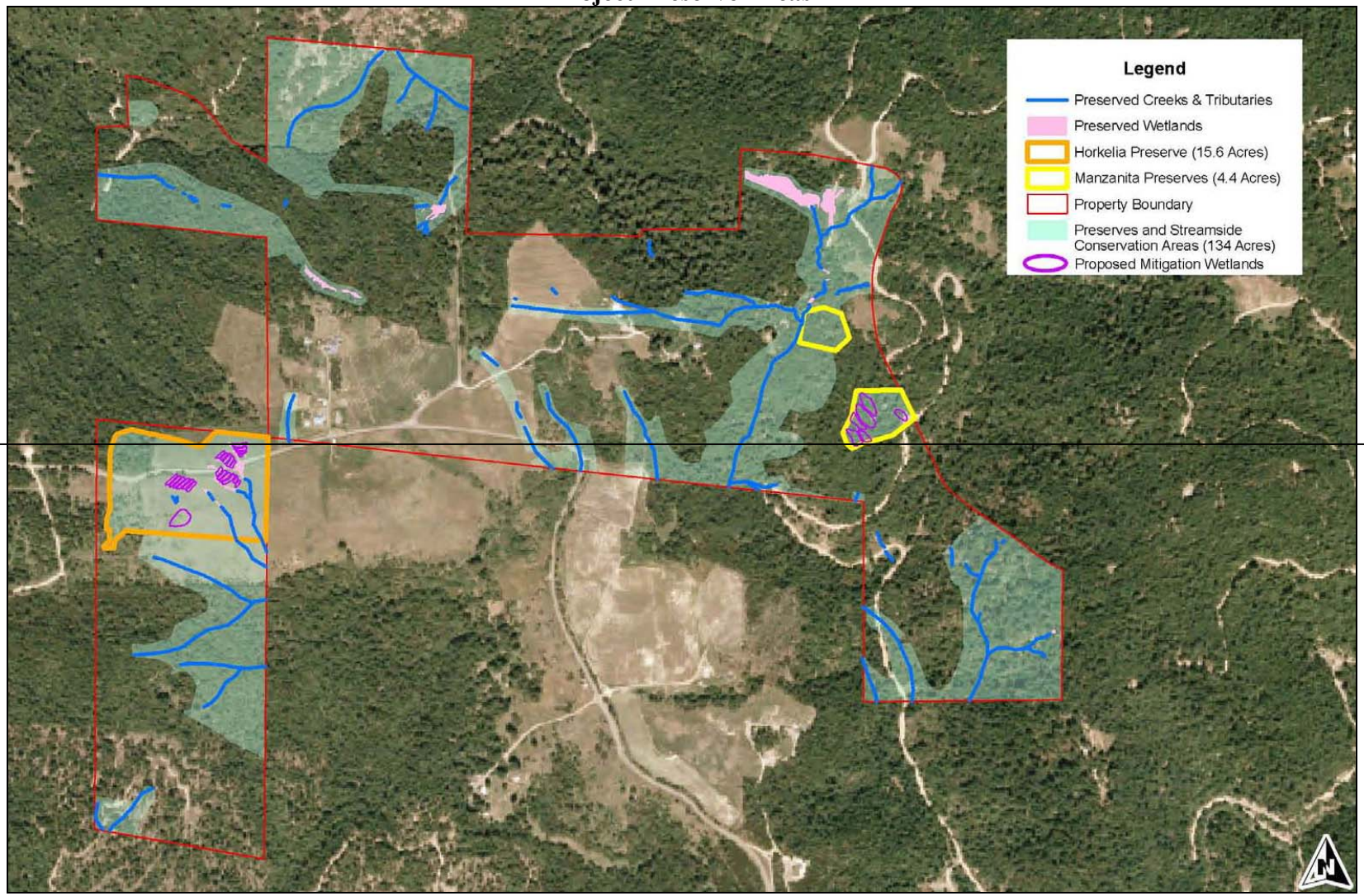
The above is for clarification purposes and does not change the conclusions of the DEIR.

Page 3.4-40 of the DEIR is hereby revised to clarify locational data for the Gualala roach:

> The closest known record for Gualala roach is located approximately ~~3.3~~ 2 miles ~~southwest of~~ below the project site~~, and 6.2 miles downstream from the project site.~~ in the Upper Wheatfield Fork of the Gualala River (KRIS Gualala Database). ~~This record is at the confluence of the South fork and the Wheatfield fork of the Gualala River, along Annapolis Road in wide and fast water.~~ The project site does not provide suitable habitat for Gualala roach, because the tributaries onsite do not provide suitable flows or water depths for fish. Careful surveys were conducted in all aquatic habitats on the project site for amphibian larvae. Fish were not observed in pools in Patchett Creek or anywhere else on the project site. Patchett Creek is only partially perennial on the project site. In the summer, it dries down to just a few pools that persist in heavily shaded habitats. Records of fish on the project site do not exist.

The above is for clarification purposes only and does not change the conclusions of the DEIR.

Figure 3.4-4
Project Preserve Areas



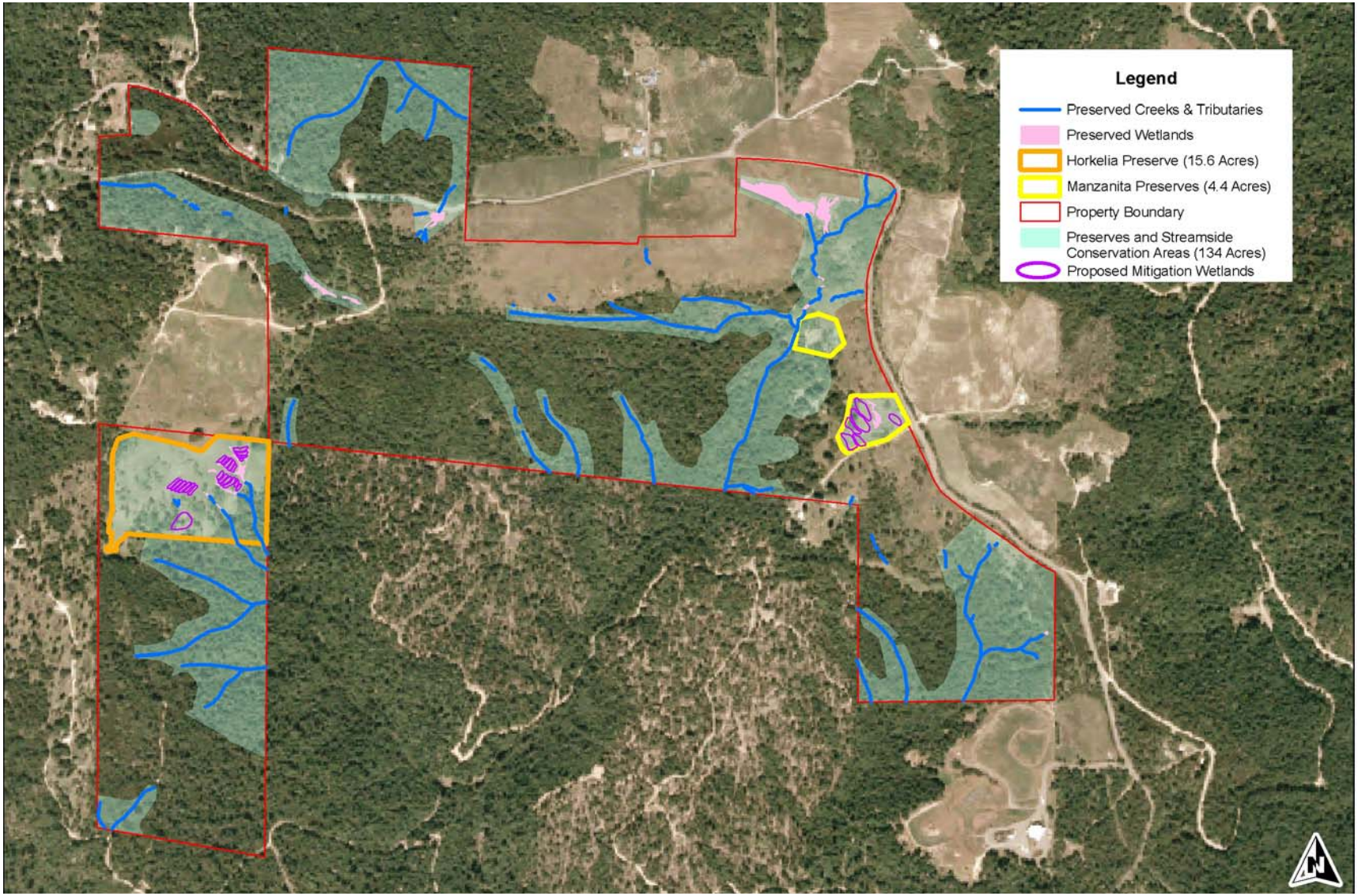

Legend
Preserved Creeks & Tributaries
Preserved Wetlands
Horkelia Preserve (15.6 Acres)
Manzanita Preserves (4.4 Acres)
Property Boundary
Preserves and Streamside Conservation Areas (134 Acres)
Proposed Mitigation Wetlands
N

Table 3.4-3, *Special-Status Wildlife Species Potentially Occurring on the Project Site*, starting on page 3.4-31 of Chapter 3.4, *Biological Resources*, of the DEIR is hereby revised on the following page to modify the discussion related to Steelhead – Northern California ESU (see Response to Comment 12-9).

Species	Status	Habitat	Closest Locations	Potential for Occurrence
Steelhead – Northern California ESU *Oncorhynchus mykiss*	Fed: FT State: Other:	Coastal basins from Redwood Creek south to the Gualala River, inclusive. Does not include summer-run steelhead.	~~No records within 10 miles of the project site.~~ According to the North Coast Regional Water Quality Control Board (NCRWQCB), steelhead are found in the lower (Class I) reaches of Patchett Creek commencing about 4,800 feet downstream of the project area. Steelhead are not able to migrate above this point, as there is an impassable area to further upstream reaches.	**None.** No suitable habitat present on project site. Water is intermittent and too warm in summer months to support fry. Downstream diversions and blockages stop anadromous fish from reaching the project site. Largest tributary on site (Patchett Creek) dries over most of its reach on the project site in the summer months, with perennial pools remaining in some locations. Not suitable rearing habitat for anadromous fish.

The above change serves to correct an inadvertent omission in the DEIR. This change does not present significant new information as the reported presence of steelhead in the lower (Class I) reaches of Patchett Creek commencing about 4,800 feet downstream of the project was clearly stated and evaluated as such in Impact 3.4-11 of the DEIR, Sedimentation impacts to special-status salmonids, which determined that through project design and implementation of the rigorous erosion control measures included in Chapter 3.7 of the DEIR, impacts to steelhead would be less-than-significant.

Table 3.4-3, *Special-Status Wildlife Species Potentially Occurring on the Project Site*, on page 3.4-32 of Chapter 3.4, *Biological Resources*, of the DEIR, is hereby further revised as follows (see Response to Comment 12-16):

Species	Status	Habitat	Closest Locations	Potential for Occurrence
Pacific Lamprey *Entosphenus tridentatus*	Fed: State: CSC Other:	Coastal basins along the Pacific west coast	Upper Wheatfield Fork	**None**. No suitable habitat on the project site. Patchett Creek dries over most of its reach on the project site in the summer months.

The above changes serve to clarify the fact that Pacific lamprey were considered in the fisheries analysis completed for the proposed project as clearly evidenced on page 3.4-56 of Chapter 3.4, *Biological Resources*, of the DEIR, as well as page 2 of Appendix J to the DEIR, *Fisheries Assessment for the Fairfax Conversion Project*. This change does not present significant new information as the DEIR determined that sedimentation impacts would not occur to special-status

salmonids because of the project design and implementation of the rigorous erosion control measures included in Chapter 3.7 of the DEIR. These conclusions for anadromous salmonids would also apply to anadromous lamprey.

The first two full paragraphs on page 3.4-79 in Chapter 3.4, *Biological Resources*, of the DEIR are hereby revised as follows (see Response to Comment 12-30):

> The applicant will develop a Storm Water Pollution Prevention Plan (SWPPP) as part of the project. That document, coupled with the Erosion Control components of the vineyard and reservoir plans, will ensure that a comprehensive set of Best Management Practices are applied during all phases of site development, to minimize risk of soil disturbance and sediment mobilization. These measures will ensure that siltation of hydrologic resources including but not limited to on-site tributaries, downstream tributaries, and wetlands are protected from inadvertent impacts caused by the proposed project.~~The applicant will implement a SWPPP prior to grading the site for the proposed project. These measures will ensure that siltation of onsite and downstream tributaries are minimized to an imperceptible degree. Similarly, all preserved tributaries and wetlands will be protected from inadvertent impacts from the proposed project.~~
>
> The project also includes post-vineyard construction BMPs including desilting catch basins at the lower ends of all drainage points discharging stormwater from the project site. First flushes from the project site will be captured in these basins ~~and "treated." These basins will ensure that any silt leaving the project in stormwater flows will undergo "stilling" and desilting prior to flowing off the site. As this is an agricultural project, and as vineyard rows are colonized by the natural vegetation growing in the region of the project site, all stormwater flows from the project site will be filtered through vegetation and vegetated collection ditches constructed in native soils prior to flowing into the desilting basins~~. The basins will ensure that runoff conveyed to the vineyard edge will be subjected to a discharge delay and storage residence time at very low velocity flows. Under such conditions, settlable solids per RWQCB Basin Plan definition are expected to be captured and retained on-site.
>
> ~~This treatment far exceeds standards now imposed on the development industry for development projects that create extensive impervious surfaces. Treatment basins will also function to decrease erosive flow potential from the project site by collecting stormwater and metering releases through controlled discharge points. All discharges will be further released into vegetated swales that constitute additional treatment prior to the time that stormwaters enter downstream receiving waters.~~
>
> Use of stilling basins on this project is completely discretionary, is above and beyond normal vineyard industry Best Management Practice standards, and demonstrates the project applicant's interest in developing a high quality vineyard design, even at additional expense and in vineyard acreage reduction. The

combination of upstream permanent vegetation, temporary mulch, low slope vee ditches, and detention basins at drop inlets will minimize or eliminate sediment mobilization within the vineyard setting. The stilling basins will provide backup insurance for on-site sediment retention in the unlikely event that any sediment is mobilized. The basins are designed to create a flow condition of long residence time and low velocity, resulting in deposition of any sand and cobble present in the runoff. Under high-flow conditions, fine silt and clay may remain in suspension. Under the more common low-flow situation and associated long residence times, much clearer runoff will exit the basin to an armored channel section below via an outlet and pipe sized at a minimum for the 100-year storm. Conservatively designed hydraulic structures will prevent overtopping flows from the basins. The armored section will reduce water velocity and spread flows to recreate pre-construction drainage flow conditions within the receiving channel. Annual inspection and dry season cleanout-maintenance, if required, will ensure that the individual basins retain sediment detention capacity.

Basin failure potential is considered extremely low, as construction to County standards will utilize local soil as engineered fill and the hydraulic components will be sized for the 100-year storm event. In the highly unlikely event of substandard basin performance, the low embankment height and very small storage volume would limit impacts to a short duration and to the immediate surroundings.

The above changes are for clarification purposes only and do not change the conclusions of the DEIR.

Methods for monitoring and reporting requirements for thin-lobed horkelia and Annapolis manzanita are presented in the revised Mitigation Measures 3.4-1 and 3.4-2 on page 3.4-127 of the DEIR (see Response to Comment 1-23):

3.4-1 *Prior to ~~the issuance of a grading permit~~ initiation of timber harvest operations, the applicant shall establish a 15.65-acre preserve on lands that ~~has~~ have been designated on the west side of the project site that will protect the largest population of thin-lobed horkelia from the proposed project impacts (Figure 3.4-4). This preserve will be dedicated in a permanent deed restriction recorded on the title of the property that shall run with the land in perpetuity.* ~~*A wetland mitigation plan proposes the creation of wetlands in the thin-lobed horkelia preserve and in an Annapolis manzanita preserve (see below). Wetland creation will occur in portions of the preserve that do not currently support thin-lobed horkelia. Regardless, a very small number of these plants could be impacted within the preserve from implementation of a wetland mitigation compensation plan. This plan shall be subject to the review and approval of the CAL FIRE and the Sonoma County Permit and Resource Management Department.*~~

The thin-lobed horkelia preserve shall be fenced prior to initiation of timber harvest operations according to the Fencing Plan prepared by Erickson Engineering. Wildlife-friendly fencing shall be installed along the northern and western perimeter of the preserve, with one gate at the northern road entrance. Wildlife-friendly fencing shall include a metal post and wire fence that would allow wildlife access to the preserves. No fencing will be necessary along the southern preserve boundary, as the preserve will be contiguous with a protected Streamside Conservation Area. Likewise, no fencing will be required along the eastern preserve boundary, as the adjoining forested lands are steep and undevelopable.

~~*In addition, the vineyard has been designed to ensure that agricultural runoff does not enter the preserve. Following completion of vineyard development activities, the applicant shall ensure that any herbicide applications which may take place in the nearby vineyard unit(s) do not affect or enter the thin-lobed horkelia reserve.*~~

~~*The plan shall be subject to the review and approval of the Department of Forestry and the Sonoma County Permit and Resource Management Department.*~~

Tree saplings shall be cleared on a yearly basis to prevent forest succession within the preserve. In addition, the vineyard has been designed to ensure that agricultural runoff does not enter the preserve. Following completion of vineyard development activities, the applicant shall ensure that any herbicide applications which may take place in the nearby vineyard unit(s) do not affect or enter the thin-lobed horkelia reserve.

Road access into the thin-lobed horkelia preserve shall be limited to vehicles for the purpose of wetland creation, preserve management, maintenance, and scientific study. Timber harvest operations vehicles will use the new road that will be constructed north and west of the thin-lobed horkelia preserve to access the area south of the preserve as indicated on the revised Vineyard Plan dated May 24, 2010.

Weed-free mulch, native slash or clean straw shall be used for erosion control throughout the project site. All cover crops and erosion control seed mixes will use either native grasses derived from genetic stock from the region of the project site, or the sterile wheat/tall wheat hybrid, Regreen©. Within the horkelia preserve, erosion control shall be used on existing and temporary roads in

areas where the potential exists for excessive sediment delivery to preserves and existing wetlands. All necessary erosion and sediment controls will be in place during activity associated with the construction of the access road west of the thin-lobed horkelia preserve.

In accordance with CDFG Guidelines for Conservation of Sensitive Plant Resources Within the Timber Harvest Review Process and During Timber Harvesting Operations [1], a five-year mitigation monitoring plan for the thin-lobed horkelia preserve shall be implemented as follows. The mitigation monitoring plan will ensure that timber operations are conducted consistent with the mitigation measures specified in the EIR.

To determine if the thin-lobed horkelia preserve is successfully supporting thin-lobed horkelia, the applicant shall have a qualified biologist conduct five years of plant monitoring. Annual spring sampling will be conducted when thin-lobed horkelia is in flower. Generally this species is in flower throughout its range between the months of May, June, and July. In 2009, thin-lobed horkelia was in full bloom in the proposed thin-lobed horkelia preserve in mid-June.

Monitoring shall include establishing fixed line sampling transects. In this fashion, trends in the plant communities can be ascertained. Sampling along fixed transects shall occur using a point intercept method derived from Bonham[2] to demonstrate and quantify the extent of cover of the monitored species. The systematic point-intercept sampling method will be used to determine the frequency of plant species or group of plant species in the community.

Plant cover data for the monitored species shall be arrayed each year and compared. Because of normal stochastic fluctuations in all plant populations, only precipitous drops in cover of the monitored species shall be cause for further investigation. Plant cover data shall be arrayed over the five year monitoring period to determine population trends for the monitored plants. If the trend is significantly down, the annual monitoring report shall include an assessment of the possible reasons for population declines and recommendations for remedial actions that could reverse trends. Weather conditions such as drought and acts of God such as fire

[1] *CDFG 2005. Guidelines for Conservation of Sensitive Plant Resources Within the Timber Harvest Review* Process and During Timber Harvesting Operations. Sacramento: California Department of Fish and Game, Habitat Conservation and Planning Branch.9p. https://r1.dfg.ca.gov/portal/Portals/12/THPBotanicalGuidelinesJuly2005.pdf.

[2] Bonham, C.D. 1989. Measurements For Terrestrial Vegetation. John Wiley & Sons. New York. 338 pp.

that cause precipitous population declines shall not constitute sufficient reason to take remedial actions. Any proposed remedial actions shall be discussed with CDFG in advance of the implementation of such measures.

At the end of each monitoring year, a monitoring report shall be submitted to the CDFG and CAL FIRE. At the end of the five-year monitoring period, CDFG shall be invited to examine the plant preserves to further go over conclusions presented in the final five-year monitoring report. At the end of the five-year monitoring period, provided the preserve is supporting a stable thin-lobed horkelia population, all monitoring requirements shall terminate.

3.4-2 *Prior to ~~issuance of a grading permit~~ initiation of timber harvest operations, the applicant shall set aside an area totaling approximately 4.4 acres on the east side of the project site (see Figure 3.4-4) for the preservation of Annapolis manzanita identified on the Artesa property. The preserve shall be dedicated in perpetuity through a permanent deed restriction recorded on the title of the property. The preserve area shall not be developed. Timber operations in the areas adjacent to the preserve shall use directional falling so that timber marked for removal falls away from the reserve area. Heavy equipment and vehicles shall be excluded from the preserve area during timber harvest operations and project development and operation~~s~~.*

The manzanitas within the~~se~~ preserve~~s~~ will be protected by fencing that will be installed prior to initiation of timber harvest operations and maintained by the owner ~~also~~ in perpetuity. The preserve shall be fenced according to the Fencing Plan prepared by Erickson Engineering. Wildlife-friendly fencing shall include a metal post and wire fence that would allow wildlife access to the preserve. The preserve will be protected by vineyard fencing where it abuts with Vineyard Unit 4. Vineyard fencing will consist of standard vineyard deer fencing. Wildlife-friendly fencing will protect the east and south side of the preserve where it abuts with Annapolis Road and a dirt access road, respectively. Gates accessing the preserve shall remain locked at all times. It should be noted that extra care has been taken to ensure that there is a cohesive wildlife corridor planning element in the vineyard plan. All tributary and other preserves are only fenced with vineyard fencing where vineyards abut these protected features. Otherwise all remain open to larger contiguous blocks of unfenced lands.

~~Fencing specifications shall be as recommended by CDFG, but at a minimum would include a metal post and wire fence that would~~

~~*allow wildlife access to the preserves.*~~ *Tree saplings shall be cleared on a yearly basis to prevent forest succession within the preserve. The vineyard has been designed to ensure that agricultural runoff does not enter the preserve. Following completion of vineyard development activities, the applicant shall ensure that any herbicide applications which may take place in the nearby vineyard unit(s) do not affect or enter the Annapolis manzanita reserve.*

Weed-free mulch, native slash or clean straw shall be used for erosion control throughout the project site. All cover crops and erosion control seed mixes will use either native grasses derived from genetic stock from the region of the project site, or the sterile wheat/tall wheat hybrid, Regreen©. Within the horkelia preserve, erosion control shall be used on existing and temporary roads in areas where the potential exists for excessive sediment delivery to preserves and existing wetlands. All necessary erosion and sediment controls will be in place during activity associated with the construction of the access road west of the thin-lobed horkelia preserve.

A five-year mitigation monitoring plan for the Annapolis manzanita preserve shall be implemented that includes the following measures. Monitoring shall include measuring the area occupied by Annapolis manzanita. As Annapolis manzanita is a woody perennial plant, it can be monitored at any time of the year, so surveys that are conducted concurrently with thin-lobed horkelia monitoring are acceptable. Aerial coverage of Annapolis manzanita shall be measured by GPS mapping with submeter accuracy. In this fashion, trends in the plant communities can be ascertained. It is expected that over a five year monitoring period the area occupied by Annapolis manzanita will remain fairly consistent. In the event that aerial coverage by Annapolis manzanita drops significantly over the five year monitoring period, the reasons for decline shall be investigated.

Remedial actions shall include replanting and other measures necessary to reverse trends. Weather conditions such as drought and acts of God such as fire that cause precipitous population declines shall not constitute sufficient reason to take remedial actions. Any proposed remedial actions shall be discussed with CDFG in advance of the implementation of such measures.

At the end of each monitoring year, a monitoring report shall be submitted to the CDFG and CAL FIRE. At the end of the five-year monitoring period, CDFG shall be invited to examine the plant

preserves to further go over conclusions presented in the final five-year monitoring report. All monitoring requirements shall terminate at the end of the five-year monitoring period, provided the preserves are supporting a stable Annapolis manzanita population.~~The plan shall be subject to the review and approval of the Department of Forestry and the Sonoma County Permit and Resource Management Department.~~

The above changes serve to provide additional methodological details to existing DEIR Mitigation Measures 3.4-1 and 3.4-2, which already ensure that the project's impacts to thin-lobed horkelia and Annapolis manzanita are less-than-significant.

On February 23, 2010, the USFWS published a revised northern spotted owl survey protocol titled "Draft 2010 Protocol For Surveying Management Activities That May Impact Northern Spotted Owls." Because Spot Check surveys are a requirement of the 2010 protocol, they were not identified in the Draft EIR circulated in 2009. Spot Check Surveys pursuant to the 2010 protocol are included in this Final EIR, and Mitigation Measure 3.4-4 is updated as follows on pages 3.4-132ff:

Mitigation Measure(s)
Implementation of the following mitigation measures will ensure that the proposed project would not result in take of the northern spotted owl. Accordingly, implementation of the measures below would reduce impacts to the northern spotted owl to levels regarded as *less-than-significant*.

3.4-4(a) *While a single year of survey can be conducted pursuant to the USFWS's 1992 survey protocol (USFWS 1992a), in this protocol the USFWS encourages completion of a two-year survey "to provide a higher likelihood of accurately determining presence or absence of spotted owls." No northern spotted owls were detected during the two-year ~~survey~~ protocol survey conducted on the project site in 2006 and 2007 pursuant to the USFWS' 1992 survey protocol. Pursuant to ~~the USFWS~~' this survey protocol ~~(USFWS 1992a)~~, completion of a two-year survey with negative results ~~indicates that the project site does not have to be surveyed again for two more years~~ remains a valid finding for two years after the survey is completed. Thus, if timber harvesting ~~begins~~ had begun prior to 2010, no further surveys ~~are~~ would have been necessary pursuant to the 1992 protocol. However, ~~as the northern spotted owl is a mobile species, out of an abundance of precaution, if timber harvesting or site grading commences before 2010, a pre-disturbance northern spotted owl survey shall be completed in the 30 day period prior to site disturbance. If timber harvesting commences in 2010 or in later years, a second set of full protocol-level surveys shall be required prior to the commencement of site disturbance.~~ because timber harvesting will commence in 2012 or*

in later years, a second set of full protocol-level surveys was conducted pursuant to the Draft 2010 Northern Spotted Owl Survey Protocol in 2010 and in accordance with the final revised 2011 Northern Spotted Owl Survey Protocol in 2011. No northern spotted owls were found on the project site in 2010 or 2011. Pursuant to the 2011 Northern Spotted Owl Survey Protocol, and consistent with the recommendations of the USFWS in this protocol, "Spot Check Surveys" shall be conducted in survey years 3 (2012) and 4 (2013) in order for the negative survey findings to remain valid in years 2012 and 2013. Survey results shall be submitted to CAL FIRE. Spot Check Surveys are defined in the USFWS' 2011 protocol as 3 nighttime surveys within a 0.25 mile radius of the project area. Negative survey findings from the 2010 and 2011 surveys that were conducted pursuant to the 2011 Northern Spotted Owl Survey Protocol, with spot check surveys in years 3 and 4 that are also negative, will validate negative survey findings through 2013. Should timber harvesting commence in 2014 or in later years, a second set of full protocol-level surveys will be conducted pursuant to the 2011 Northern Spotted Owl Survey Protocol or any revision to this protocol in place after 2013.

3.4-4(b) *Current survey information indicates that at this time there are no impacts that are expected to occur to the northern spotted owl. Regardless, as required to comply with the Forest Practices Act as detailed at 14 CCR § 919.9, the following habitat protection measures shall be established to protect the northern spotted owl if in subsequent years ~~any~~ northern spotted owls ~~is detected during subsequent surveys.~~ establish an activity center closer than 0.7 mile of the project site.*

(It should be noted that the remainder of Mitigation Measure 3.4-4(b) is not included here as no changes to this portion of the measure have been made). The above mitigation measure changes serve to provide updated methodological details to existing DEIR mitigation measures which already ensure that the project's impacts are less-than-significant. Please see the *Introduction* chapter of this Final EIR for additional discussion regarding northern spotted owl and these mitigation measures.

Mitigation Measure 3.4-5 concerning nesting raptors on pages 3.4-136 and -137 is hereby revised as follows (See Response to Comment 1-17):

Mitigation Measure(s)
Implementation of the following mitigation measures will ensure that the proposed project would not result in take of the nesting raptors. Accordingly, implementation of the measures below would reduce impacts to the nesting raptors to levels regarded as *less-than-significant*.

3.4-5 *Raptor ~~N~~nesting surveys shall be conducted no earlier than 30 days prior to commencing with any tree/brush removal or any earth-moving activity if this work would commence between February 1st and September 1st. The raptor nesting surveys shall include examination of all trees on the project site and, if possible owing to land access issues, within ~~500~~1,000 feet of the entire project site~~, if possible, and not just trees slated for removal~~. All stick nests and all tree cavities shall be examined for evidence of nesting raptors. Raptor nesting survey results shall be submitted to CAL FIRE.*

If an active raptor nesting site is identified, then non-disturbance buffers will be established per CDFG recommendations. That is, nest buffers will be a minimum of 500 feet for Accipiters and 1,000 feet for Buteos. These nest buffers will be maintained until the nest site(s) are vacated by the nesting raptors, typically after young fledge and disperse. Any modification in the size of nest buffers will be discussed with CDFG prior to harvesting timber or clearing vegetation any closer than 1,000 feet from identified active nests. ~~If nesting raptors are identified during the surveys a 300-foot radius around the nest tree must be demarcated with a double stand of bright orange flagging tape tied 5 to 8 feet above the ground. If the tree is adjacent to the project site then the buffer shall be demarcated per above where the buffer occurs on the project site. The size of the buffer may be altered if a qualified raptor biologist conducts behavioral observations and determines the nesting raptors are well acclimated to disturbance. If this occurs, the raptor biologist shall prescribe a modified buffer that allows sufficient room to prevent undue disturbance/harassment to the nesting raptors. Any buffer that is established that is less than 150 feet shall require behavioral monitoring by a qualified raptor biologist until such time that the young fledge. In the event the smaller buffer is not sufficient to protect the nesting birds the monitoring biologist shall have the right to re-establish a larger buffer up to a 300 foot buffer. No tree or brush removal, earth-moving activities, or human intrusion (except by biologists or individuals accompanied by a qualified raptor biologist) shall occur within the established buffer until it is determined by a qualified raptor biologist that the young have fledged (that is, left the nest) and have attained sufficient flight skills to avoid project construction zones. This typically occurs by August 1. This date may be earlier than August 1, or later, and would have to be determined by a qualified raptor biologist.~~

The above changes serve to provide additional methodological details to existing DEIR Mitigation Measures which already ensure that the project's impacts are less-than-significant.

Since the release of the DEIR CAL FIRE has identified the need to make the following minor clarification to the first paragraph of Mitigation Measure 3.4-6 on page 3.4-135 of the DEIR:

3.4-6 *The Migratory Bird Treaty Act and California Fish and Game Code Sections 3503, 3513, and 3800 prohibit the direct take of birds and their eggs and/or young. While birds in general can fly out of harm's way, bird's nests are vulnerable to destruction and disturbance that causes nest abandonment and concomitant loss of eggs and/or young. The project shall not impact nesting birds. Accordingly, if harvesting/conversion/land clearing and/or grading would occur between February 1st and September 1st, qualified biologists shall be required to conduct systematic, intensive preconstruction nesting bird surveys to ensure that there is no direct take of nesting birds, their eggs or young. Surveys should be in focused areas that consist of 100' x 100' plots of land and shall commence no sooner than two weeks in advance of timber harvesting/land conversion. Survey results shall be submitted to CAL FIRE.*

The above change is for clarification purposes and does not change the conclusions of the DEIR.

Since the release of the DEIR CAL FIRE has identified the need to make the following minor clarification to the first paragraph of Mitigation Measure 3.4-7 on page 3.4-136 of the DEIR:

3.4-7 *To ensure that no construction-related impacts occur to nesting yellow warblers on the project site, preconstruction surveys for yellow warblers should be conducted no more than two weeks (14 days) prior to ground disturbance and/or clearing of brush and/or timber. Survey results shall be submitted to CAL FIRE. If nesting yellow warblers are identified nesting on or adjacent to the project site, a suitable temporary buffer area should be fenced around the nest tree. The size of the nesting buffer would need to be determined in the field by a qualified ornithologist, but should be, at a minimum, no less than 100 feet between the nest site and the construction area.*

The above change is for clarification purposes and does not change the conclusions of the DEIR.

Since the release of the DEIR CAL FIRE has identified the need to make the following minor clarifications to Mitigation Measure 3.4-9 on page 3.4-138 of the DEIR:

3.4-9 *In order to avoid impacting Patchett Creek and the foothill yellow-legged frogs that reside in this creek, a minimum 100-foot protective buffer will be ~~maintained~~ established prior to timber harvest operations between Patchett Creek top-of-banks and any timber harvest operations, and subsequently, project site development (Figure 3.4-4). This buffer will ensure that the*

existing shade and sunlight regimes present today in Patchett Creek are maintained except as modified by natural succession. In addition, a project site preconstruction SWPPP will be implemented prior to ~~implementation of grading~~ initiation of timber harvest activities to ensure that Patchett Creek, and indeed most tributaries on the project site (with rare exception), are protected from siltation and/or other project-related downstream impacts. Similarly, a post-project BMPs plan will also be implemented to ensure that there are no impacts to the water quality in Patchett Creek or other downstream receiving waters after implementation of the project. In addition, there is no significant potential for contamination of Patchett Creek by the use of fertilizer, herbicide, insecticide, or other agricultural chemicals in the proposed vineyard. Qualified, properly certified vineyard managers will use only State-approved fertilizers, herbicides, insecticides or other agricultural chemicals in accordance with the label instructions and any applicable usage guidelines in the event that any of these are determined necessary. Implementation of the SWPPP and the post project BMPs plan, and the establishment of protective buffers along Patchett Creek will ensure that impacts to the foothill yellow-legged frog are avoided. These measures are refined in Mitigation Measure(s) 3.7-2(a-h), 3.7-3(a and b) and 3.7-4.

The above changes are for clarification purposes and do not change the conclusions of the DEIR.

Since the release of the DEIR CAL FIRE has identified the need to make the following minor clarifications to Mitigation Measure 3.4-10(a) on pages 3.4-140 and -141 of the DEIR:

3.4-10(a) *A qualified 10(a)(1)(A) biologist authorized to work with the California red-legged frog shall conduct protocol-level surveys for California red-legged frog prior to initiation of timber harvest operations based on the field methods presented in the U.S. Fish and Wildlife Service's (USFWS) Revised Guidance on site assessment and field surveys for California red-legged frogs (dated August 2005). The USFWS Guidance recommends a total of eight (8) surveys to determine the presence of California red-legged frog at or near a project site. Two (2) day surveys and four (4) night surveys are recommended during the breeding season (January 1 to June 30); one (1) day and one (1) night survey are recommended during the non-breeding season (July 1 and September 30). Each survey must take place at least seven (7) days apart, although you can pair a diurnal and a nocturnal survey during a 24 hour period. At least one diurnal and one nocturnal survey must be conducted after July 1st and before August 15th. The survey period must be over a minimum period of 6 weeks (i.e.,*

> *the time between the first and last survey must be at least 6 weeks). The survey results shall be submitted to CAL FIRE. If no California red-legged frogs are found within the project area during these surveys, no further regard for the California red-legged frog would be necessary. No additional mitigation measures would be required and impacts would be regarded as less than significant pursuant to the CEQA. If red-legged frogs are identified at any time during the course of surveys, no additional surveys will be conducted in the area, unless the surveying effort is part of a Service-approved project to determine the distribution of frogs at a site.*

The above changes are for clarification purposes and do not change the conclusions of the DEIR.

The following paragraphs and figure have been added for clarification purposes before the last paragraph of Impact 3.4-14, Impacts to special-status salmonids from project-related decreases in instream base flows, on page 3.4-147 of Chapter 3.4, *Biological Resources*, of the DEIR (see Response to Comment 12-5):

> For the Artesa Fairfax conversion, the diversion of runoff to the irrigation reservoir will reduce stream flow during some periods of storm runoff. However, this will occur only during peak flow periods during the winter when the reduced flow will be negligible downstream. This is in accordance with CDFG/NOAA Marine Fisheries (2002) guidelines for cumulative diversions less than 5 percent during winter peak flow conditions when stream flows are generally high and when water withdrawals would be least likely to adversely affect fisheries resources. The diversion of this runoff will tend to offset predicted increases in runoff from the project area.
>
> Vineyard irrigation water will be obtained by capture of seasonal surface runoff from normally dry upland areas. There are no existing or proposed tile drains or groundwater capture systems in the vineyard water development plan. Groundwater will therefore not be impacted by irrigation water collection and storage.
>
> Upland vineyard surface runoff will occur in the form of non-jurisdictional diffuse sheet flow. Runoff will be captured by a system of low-slope vegetated vee ditches draining to surface drainage collection and erosion control pipes. Vee ditches will be spaced approximately 60 feet on center to eliminate the long pre-construction sheet flow runoff paths presently conducive to rill and gully erosion. Collected sheet flow will be routed to an off-channel sump where it will be pumped to the remote upland storage reservoir.
>
> Per USDA-SCS Sonoma County Soil Survey, the local Goldridge soils have a moderately high available water holding capacity of about 0.15 inches of water per inch of soil depth, and moderately high surface soil permeability of 0.6 – 2

inches/hour. Assuming a 36-inch rooting depth soil profile, this implies that the first 5-inch or so of rainfall will not run off, but will soak in to saturate the soil profile. Depending on the timing, duration, and frequency of subsequent rainfall events, some portion of the incremental rainfall will be expected to infiltrate and the remainder to be expressed as sheet flow runoff.

Sonoma County Water Agency design criteria assume about 40% of annual precipitation occurs as runoff and by inference about 60% goes into the profile as deep percolation. Some unknown percentage of the latter would be lost to the atmosphere due to evaporation and transpiration. For an average annual rainfall of 70 – 75 inches per Sonoma County Water Agency design criteria, about 28-30 inches would be expected as sheet flow runoff and about 42 – 45 inches less evapotranspiration would be expected as deep percolation for groundwater recharge. Using the more conservative NOAA precipitation data of about 58 inches average annual rainfall, about 23.2 inches would be expected as sheet flow runoff and the remaining 35 inches less evapotranspiration would be expected as deep percolation for groundwater recharge.

A supplemental graphic has been prepared as an aid to evaluating project impacts on groundwater recharge and on surface runoff at various points in the Patchett Creek Watershed. The reservoir and sump surface (5.5 ac) and sheet flow collection system (33.5 ac) encompass only about 39 acres of the 324-acre property. The 39-acre sheet flow collection area is limited to partial uplands of Patchett Creek. The point of confluence of the sheet flow discharge area with Patchett Creek (Node 1) is less than 200 feet downstream of it being considered "designated" by Sonoma County and showing as a blueline on the quad map. At that point the total watershed is 39+70 = 109 acres, with the collection area representing 35.8% of the total. At Node 2, 4,800 feet downstream where the last project-related drainage enters Patchett Creek, the tributary area has grown to about 460 acres, with the catchment representing 8.5% of the total. At a point 9,400 feet downstream, Patchett Creek enters the Wheatfield Fork of the Gualala River with a tributary area of about 1,080 acres, with the catchment area representing 3.6% of the total.

Node	Channel Length, Ft	Total Ac	39 = % of Total area	Water-shed yield Ac-ft	75 ac-ft = % of runoff	% remaining annual runoff	Deep percolation ac-ft
0	0	39	100.0	91	83	17	30
1	180	109	35.8	214	35	65	85
2	4380	460	8.5	893	8	92	359
3	9580	1080	3.6	2091	3.6	96	842

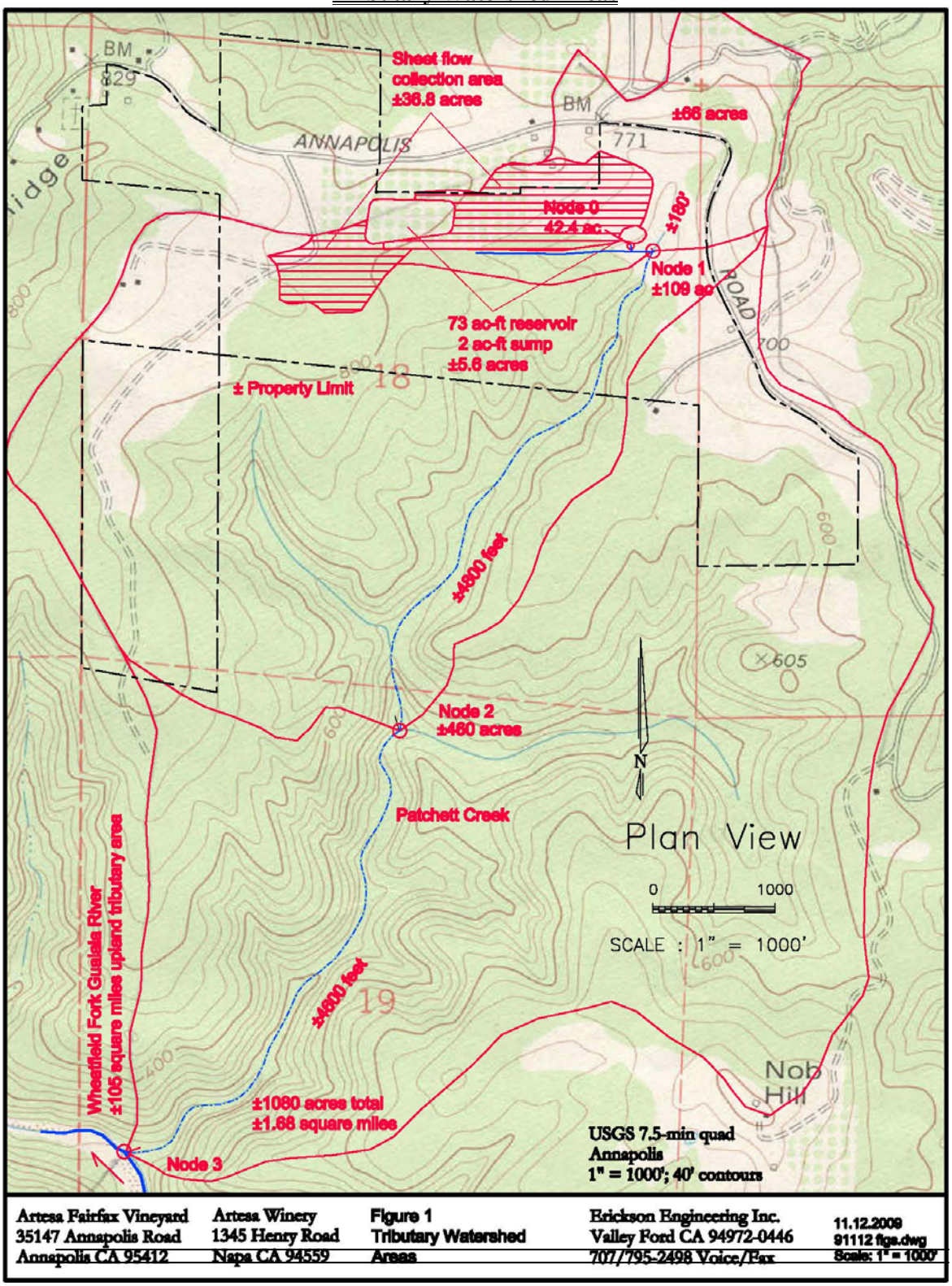
Table notes and assumptions:

- Project sheet flow capture area = 39 acres.
- Average year rainfall 70" per Sonoma County Water Agency data. And +-58" per NOAA data . The lower value was used for a more conservative analysis.
- Project capture 0 – 75 ac-ft max; Reservoir at 73 ac-ft, sump at 1.6 ac-ft.
- Watershed yield: (58"/yr /12"/ft)*0.4 runoff* A acres =>1.93 ac-ft/ac (58*.4 = 23.2")
- From an average year watershed yield standpoint, assume 58" (4.83') rainfall, C = 1.0 for the impoundments and C = 0.4 for uplands. Then yield is Rainfall*Runoff factor*Area = 4.83*1*5.5 + 4.83 *0.4*33.5 = 90.3 ac-ft. This is sufficient to fill the reservoir and sump from bone dry conditions with average year rainfall. Once operational, residual carry-over would be expected on an annual basis, so less than 73+1.6 = 74.6 ac-ft would be needed to recharge the system.
- Evaporation, transpiration – assumed at .10"/day x 180 days (May 15-Nov15) = 18" and 0.04"/day x 185 days (Nov 15-May 15) = 7.4", total 25.4"): 2.1 ac-ft/ac
- Deep percolation: Remainder: 58 – 23.2 – 25.4 = 9.4" project area and non project area 0.78 ac-ft/ac.

Total sheet flow capture watershed area at Node 0, at sump outfall, is about 39 acres. Of the 83-acre-feet of average year runoff expected, about 91% (75 ac-feet) will be captured during the first year bone-dry startup conditions. In subsequent years with residual water storage, this value may be considerably reduced. The runoff retained during the winter runoff season would otherwise eventually be lost to beneficial use by discharge to the ocean. Within the vineyard, about 30-acre-feet will not be captured or lost to evapotranspiration, and will be available for groundwater recharge. This is equivalent to the volume needed to serve about 30 single-family residences for a year.

Node 1 is located where project overflow first enters Patchett Creek, about 180 feet downstream of where the creek is first considered "designated," according to County statutes and per blue-line rendering on the Annapolis Quadrangle map. At this point, vineyard impacts to surface runoff are already reduced to 35% of the total, and groundwater recharge due to deep percolation is about 85-acre-feet. Patchett Creek in the non-designated reach above Node 1 will have nearly 100% of pre-project runoff at all times. Below Node 1 Patchett Creek will have a minimum annual runoff at 65% of pre-project conditions, including first flush runoff from non-vineyard areas. Runoff timing is therefore not affected by project implementation. Between Nodes 1 and 2 the ratio of pre- and post-project runoff will rapidly increase from 65% to 92%

Figure 3.4-8
Tributary Watershed Areas



Node 2 is the last point on Patchett Creek potentially impacted by upland vineyard development. At that point there will be about 842-acre-feet of deep percolation theoretically available for late season recharge and residual flows within the creek. Surface runoff impacts are reduced to 8% of the total and annual runoff will be about 92% of pre-project conditions. Because annual flows vary by more than 7%, the inherent background noise in runoff data would make it scientifically difficult to measure project impacts on channel flows at this point.

Node 3 is the confluence of Patchett Creek with the Wheatfield Fork of the Gualala River. At this location, some 1.8 miles below the project discharge location, watershed yield is over 2,080-acre-feet, and project sheet flow capture is about 3.6% of the total. Again, with 96% of pre-project runoff present, project impacts would be imperceptible in terms of measurements relative to inherent variability in background data. Also, about 842-acre-feet of deep percolation is expected, some fraction of which would be expressed as residual flows throughout the dry season.

Per O'Connor's work, the Wheatfield Fork tributary area above the confluence with Patchett Creek is about 105 square miles. The 1.68 square mile Patchett Creek drainage thus comprises about 1.6% of the Wheatfield Fork drainage below the confluence. Hydrologic impacts to the lower drainage due to project implementation are extremely small and immeasurable at 1.6% of 3.6%, equivalent to about 1 part in 1,740.

This simplified evaluation is a worst-case scenario that neglects expected increases in runoff associated with forest conversion and still demonstrates negligible impacts to groundwater resources. All the Caspar Creek research cited by O'Connor in Appendix M to the DEIR indicates increases in both peak flow and annual yield, which would increase values noted for runoff and groundwater recharge.

The above changes are for clarification purposes and do not alter the conclusions of the DEIR.

Since the release of the DEIR for public review, the following clarifications have been deemed necessary for Mitigation Measures 3.4-15(a) and (b) on page 3.4-149 of the Biological Resources chapter of the DEIR.

3.4-15(a) *Prior to ~~the issuance of grading permits~~ initiation of timber harvest operations, the project applicant shall obtain a 404 permit (CWA) from the Corps. ~~If~~Upon acquiring a 404 permit ~~is obtained~~, the applicant must also obtain a water quality certification from RWQCB under Section 401 of the CWA, an NOI from the SWRCB and a Streambed Alteration Agreement from CDFG.*

3.4-15(b) *~~Prior to the issuance of grading permits~~ Simultaneous with any impacts to waters of the U.S. and/or State ("wetlands"), the*

project applicant shall compensate for the loss of wetland habitat to ensure no net loss of habitat functions and values. To mitigate for the direct loss of 0.414 acres of jurisdictional wetlands, the applicant shall create/restore wetlands at a ratio of 2:1 (2 acres created/restored for every acre lost) on the project site. Created features shall generally be in-kind for seasonal wetlands lost.

A detailed wetland mitigation plan shall be required that includes a five-year monitoring program and reporting requirements, responsibilities, performance success criteria, and contingency requirements. At the end of each monitoring year, an annual report shall be submitted to the Corps, RWQCB, ~~and~~ Sonoma County, and CAL FIRE. The report shall document the hydrological and vegetative conditions of the mitigation wetlands, and shall recommend remedial measures as necessary to correct deficiencies. Mitigation lands would be subject to a ~~conservation easement~~ deed restriction and an agency approved long-term management plan.

The ~~conservation easement~~ deed restriction would ensure that the wetlands are protected in perpetuity. The wetland mitigation plan would require approval by the Corps and the RWQCB.

The above changes are for clarification purposes and do not alter the conclusions of the DEIR as the on-site wetlands would be afforded to same level of protection.

Since the release of the DEIR CAL FIRE has identified the need to make the following minor clarification to the first paragraph of Mitigation Measure 3.4-16(a) on page 3.4-152 of the DEIR:

3.4-16~~(a)~~ *A habitat management plan shall be prepared and implemented for all streamside conservation areas and designated preserves prior to initiation of timber harvest operations. Maintenance as required to restore drainages would be one of the only allowable uses. The following uses and practices, at a minimum, may be permitted in the streamside conservation areas:*

The above changes are for clarification purposes and do not change the conclusions of the DEIR.

3.5 Cultural Resources

As a result of the additional extensive field surveys completed since the release of the DEIR in June 2009 and November 2010, the Methods of Analysis section of the DEIR, starting on page 3.5-17 is hereby amplified as follows (see Response to Comment 13-5):

Method of Analysis

Paleontology

Paleontologist James R. Allen conducted a literature study and paleontological site investigation for the Fairfax Conversion/THP project. The site investigation took place on January 25, 2001. The results of the study and investigation are contained in the Paleontological Sensitivity and Monitoring Report dated March 25, 2001. The document addresses the paleontological sensitivity of the area proposed for conversion to vineyards.

Cultural Resources

A Cultural Resources Assessment for the project site was conducted by NCRM Consulting Archaeologist Maximillian Neri and is described in the "Confidential Addendum for Timber Operations on Non-federal Lands in California," dated April 16, 2001, and revised June 19, 2001; December 17, 2001; and March 11, 2004. Prior to fieldwork, Mr. Neri conducted a literature review for the project area and requested a cultural resources records search by the Northwest Information Center (NWIC) at Sonoma State University. Mr. Neri provided written notification of the proposed project to Native American individuals and/or groups included on the Sonoma County portions of the California Department of Forestry and Fire Protection Native American Contact List on June 30, 2000 and May 25, 2001. Mr. Neri also contacted the Annapolis Historical Society regarding historical land uses on the project site, and received from them letters dated August 12, 2000 and October 4, 2000. Additionally, Mr. Neri met with local landowner and historical society member Gary Craig to discuss the presence of the two sawmills described in the historical record.

NCRM staff archaeologist Max Neri searched the project site for cultural resources. Ground visibility was generally fair in the wooded areas, and fair to poor in the grassy meadow areas. Numerous roads and skid trails were present throughout the wooded and grassy areas and provided the best opportunity for observing project soils. The areas of high archaeological sensitivity were investigated completely using pedestrian transects spaced between 20 and 30 meters, and random hoe scrapes. The areas of archaeological sensitivity included ridgelines, midslope benches, creek terraces, saddles, springs, riparian areas, and areas of moderately sloped ecotone transition.

Based on the sites identified by Mr. Neri's fieldwork, a second field investigation was conducted by Tom M. Origer of Tom Origer & Associates. Archival research was conducted using the State Archives, Sonoma County Recorder's Office, Sonoma County Assessor's Office, Sonoma County Courts, County Library History Annex, communication with local residents, examination of old county maps and atlases, census data, and USGS topographic maps.

Fieldwork was conducted on September 8th through 15th, 2006, and September 26th through 29th, 2006 for Artesa Site-02, -03, -05, and -06H. Previously recorded prehistoric archaeological resources Artesa Site-02, -03, and -05 were subjected to the following investigation procedures leading to conclusions regarding their significance. Because Artesa Site-02, Artesa Site-03, and Artesa Site-05 were marked by chipped stone specimens and dubious "groundstone" items, Origer & Associates initially attempted to apply the California Archaeological Resource Identification and Data Acquisition Program (CARIDAP): Sparse Lithic Scatters, (Jackson et al. 1988; 1994) with the intention of treating these sites as sparse lithic scatters. Additionally,

a. Each site area was mapped with the result being a map that included locations of excavation units, surface finds, and environmental features of note such as rock outcrops, trees, drainages, and springs.

b. The surface of each site was examined and artifacts were flagged, mapped, and collected for analysis. Examination of the distribution of exposed archaeological materials guided the placement of excavation units.

c. Based on information gathered from the sites' surfaces and from information contained on Neri's site record forms, 25 investigation units were excavated (eight at Artesa Site-02, six at Artesa Site-03, and 11 at Artesa Site-05) in arbitrary 10cm or 20cm levels or according to soil strata. The bulk of the soil removed from the units was screened with 6mm wire mesh; however, soils samples were processed with 3mm wire mesh to search for smaller objects. Soil samples represented approximately 20% of the level (by volume) from which they were taken. Cultural materials caught by the screens were bagged according to provenience (unit and depth below grade) and retained for laboratory processing and analysis.

d. Standard processing and analysis of recovered specimens was completed and included: cleaning, sorting, classifying, cataloging, and preparing the collection for accessioning. However, the Kashia prefer to have the collection reburied on site if possible (Reno Franklin, personal communication). Analysis of recovered materials included obsidian sourcing and hydration dating, technical analysis of flaked stone debris, species determination of shellfish, and examination of the distribution of site constituents and site structure.

The sites had not been previously tested to determine their importance. Tasks completed at the sites were designed to accurately establish each site's boundaries, depth, integrity, and contents.

A supplemental investigation was conducted on April 24 and 25, 2008, during which a crew of three archaeologists from Origer & Associates completed a field examination of the previously documented resource locations. Notes were made

regarding current conditions at each location. Recording of the lumber mill sites was facilitated by thorough surface inspection. During the ground truthing process, which used a metal detector, probe, and pick and shovel, any archaeological deposits discovered were incorporated into the resource field sketch maps, and notes were taken. Interviews with knowledgeable local residents of the general area added information about the lumber milling activities, especially within the project site. All of the information was incorporated into the site recording documents. Archival research also added information incorporated onto the DPR 523 forms. Because there was extensive overlap in the locations of mill features, a single record was completed for the two operations.

July 2009 Surveys

Since the release of the DEIR for public review, six previously unrecorded archaeological resources were identified during the June 2009 Pre-Harvest Inspection (PHI), which is a field meeting that is part of the Timber Harvesting Plan (THP) review process, involving the California Department of Forestry and Fire Protection (CAL FIRE) as lead agency and other government regulatory agencies. One of these resources was discovered just outside of the project site boundaries, near project Unit 8c, on the Mendocino Redwood Company property, while the PHI attendees were inspecting the extreme southern corner of Unit 8c. More specifically, the site is a sparse scatter of stone tools and chipped stone tool-making debris located just beyond the southeast corner of the Artesa property in the southwest quarter of Section 18 (T10N;R13W). One large obsidian tool (bifacially worked) was made from Mt. Konocti obsidian, Lake County, California. Obsidian chipping debris from the Mt. Konocti obsidian source was also identified. Temporally diagnostic artifacts were not observed so no date of occupation can be assigned at this time. Alterations to the site area derived primarily from timber harvest and management activities (i.e., road construction and use).

During an additional follow-up field visit to the project site by CAL FIRE archaeologist Chuck Whatford and Reno Franklin, Tribal Historic Preservation Officer (THPO) of the Kashia Band of Pomo Indians of Stewarts Point Rancheria, another previously unidentified archaeological site was found, containing obsidian and chert flakes. Subsequent to this, Assistant THPO Walter Antone attended a follow-up PHI with Tom Origer of Tom Origer & Associates and Chuck Whatford, during which time the three additional locations were assessed. Based upon the findings made during the above-described field inspections, CAL FIRE Archaeologist Chuck Whatford decided that the 2001 archaeological survey of the project area was not sufficient for the proposed conversion project and requested that another archaeological survey of the project area be performed. As a result, Origer & Associates conducted a systematic archaeological field survey, which resulted in comprehensive survey coverage of the entire project site conducted on July 16 and 17, 2009, with the exception of two areas which were subjected to mixed-strategy survey due to the fact that they were covered by dense

patches of brush (see more on this below under "November 2010 Surveys"). The results of Origer & Associates' archaeological survey and site evaluations are presented in the Confidential Report prepared for CAL FIRE review and approval, entitled "*An Archaeological Survey Report for the Artesa/Fairfax Timber Harvesting Plan*," dated August 6, 2009. The reviewing CAL FIRE archaeologist provided comments on this report that Origer & Associates incorporated into the revised report cited above.

The goal of the July 2009 survey performed by Origer & Associates was to inspect the three additional locations identified during the PHI, as well as to survey all portions of the property where timberland conversion activities and/or timber harvesting are planned. Special attention was paid to those areas where archaeological specimens were found during the PHI. An intensive surface survey strategy was employed by surveying in a zig-zag pattern on transects approximately 20-25 meters wide. As noted above, dense vegetation prevented intensive survey coverage in two portions of the project area. In these areas where the presence of very dense vegetation made conducting an intensive archaeological survey impractical, a mixed strategy survey was conducted by making forays into the brush, where possible, to examine the ground surface.

November 2010 Surveys[3]

In consideration of public comment on the DEIR, CAL FIRE requested that the applicant have their archaeologist conduct an intensive archaeological field survey of the two densely vegetated areas, which were surveyed using mixed-strategy survey techniques during the July 2009 field survey. The requested additional survey was conducted on November 10th and 11th, 2010 and focused upon a 5-acre block in the northern portion of the project area and a 15-acre block in the southern portion of the project area. To intensively survey these two dense brush locations, Origer & Associates initially proposed the use of a backhoe to flatten brush and create corridors in which the field crew could closely inspect the exposed the ground surface. After a few initial forays into the dense brush with the backhoe, it quickly became apparent that this method could not be employed without creating ground disturbance that would require a Native American monitor to be present per CAL FIRE directives. Consequently no further use of the backhoe was made during the remainder of the survey effort.

Once use of the backhoe clearing method was terminated, transects were subsequently made through the brush with loppers and other hand tools to clear the brush in locations with somewhat less dense vegetation. In the northern dense brush area (~5 acres) transects no more than 15 meters apart were traversed by a combination of clearing dense brush and crawling, as needed, to complete an intensive survey of the entire five-acre area. The same methods were applied to the

[3] *A Supplemental Cultural Resources Survey for the Artesa/Fairfax Timber Conversion, Sonoma County, CA*, Origer & Associates, December 15, 2010.

southern dense brush area (~15 acres) with less success. Although the original intention was to conduct an intensive survey of the entire 15-acre area, the presence of very dense brush made this strategy impractical and infeasible. As a result, approximately three acres of the 15 acres were intensively surveyed. The remaining 12 acres were surveyed using a mixed strategy approach.

As part of the November 2010 survey effort, Origer & Associates also intensively examined subsurface soils ranging from four to eight inches deep that have become exposed in the road cut across the Wellman property and extending southwest into the project area west of Artesa Site-01. The road bed itself was examined where past construction, use and maintenance of it had cut into native soils and thus provided good ground surface visibility with a hoe and trowel used to clear small patches of low growing grasses and forbs as needed. No darkened soil or archaeological materials were observed on the surface of the approximately 500-foot long segment of existing project road that lies to the west of Artesa Site-01, indicating that the site does not extend to the existing road.

According to "A Supplemental Cultural Resources Survey for the Artesa/Fairfax Timber Conversion, Sonoma County, CA," dated December 15, 2010, no cultural resources were found during the recent survey of the two dense brush areas as described above, or within the road cut and running surface of the existing road segment previously described.

Summary of Archival Research

In 2000, when consulting archaeologist Max Neri conducted the initial record search for this project, he found no documentation on file at the NWIC that any portion of the project area had been surveyed, nor evidence that any sites had been previously recorded in the project area. In 2005 Neri submitted his report to the NWIC and it was assigned report number S- 26495. In 2006 an updated records check was conducted of the property by Tom Origer at the request of Jeff Longcrier, the Registered Professional Forester (RPF) contracted to prepare the timber harvesting plan (THP) for the Fairfax Conversion project. This records check showed that only Origer's 2006 study of specific sites within the study area had been conducted since 2000. This study was assigned report number S-33149 by the NWIC. In 2009 for the purposes of revising the survey of the property a records check was again conducted. This records check did not show any changes since 2006. In 2010 another record search was conducted which revealed documentation of Origer and Associates' 2009 survey of the project area, which resulted in the finding of an additional six resources above Neri's original six archaeological sites and 11 isolates (Origer 2009). This report was assigned number S-36197 by the NWIC.

Three ethnographic sites have been reported near Annapolis, and therefore, in the vicinity of the current project area (Barrett 1908). Barrett's (1908:225) description of the location of ca'mli places this old village approximately one mile south of

> Annapolis. Barrett's (1908:225) description of the location of koba'te places this old village approximately one mile west of Annapolis. Barrett's (1908:225) description of the location of ma'kawica places this old village northeast of Annapolis. Based upon Barrett's descriptions of these site locations, all three of these named villages appear to be outside the project area. Tribal scholar Otis Parrish has mapped several sites in the Kashia Pomo territory. He places sites qayeeli ("where manzanita is place") and k'abat^{h}wi ("madrone fork") nearby, but outside of, the project area (Parrish 1996).
>
> Review of Barrett's ethnographic information shows some three dozen named places within two miles of the coast with another 30 or so at interior locations. The densest concentration of named places lies approximately six miles north of Plantation where five old villages and one old camp site are shown within 2.5 miles of each other (see Barrett 1908: map titled Pomo Linguistic Stock). Two other concentrations of Barrett named places in Kashia Pomo territory are marked by concentrations of four places each. Near Annapolis, Barrett shows three named places within 2.5 miles of each other (see preceding paragraph). This suggests that, while there are important Native American sites in the vicinity of Annapolis, it is not a unique area in terms of archaeological and/or cultural site density.

The modifications are for clarification purposes and do not change the conclusions of the DEIR.

The existing conclusion on page 3.5-24 of the DEIR is hereby further substantiated as follows concerning Artesa Site-03 (see Response to Comment 13-5):

> Artesa Site -03 was identified by the archaeological consultants as being ineligible for inclusion on the NRHP or the CRHR. It should also be noted that, according to *An Archaeological Survey Report for the Artesa/Fairfax Timber Harvesting Plan*," dated August 6, 2009 and revised May 6, 2010, in addition to Origer & Associates' evaluation using the CRHR and NRHP criteria, the site is not significant under any of the criteria for determining the significance of an archaeological or historic-era site listed in the California Forest Practice Rules. Walter Antone, Assistant Tribal Historic Preservation Officer (THPO) for the Kashia Band of Pomo Indians of Stewarts Point Rancheria, has also indicated that the tribe does not consider the site important.

The modifications are for clarification purposes and do not change the conclusions of the DEIR.

The results of Origer & Associates' July 2009 surveys indicate that an additional six locations were identified for further consideration and analysis, five of which have been recommended for avoidance. Therefore, Impact Statement 3.5-2 of Chapter 3.5, *Cultural Resources*, of the DEIR, is hereby revised to present the following additional cultural resources information concerning the Fairfax Conversion project site (*as reflected in Chapter 3.5, Cultural Resources, of the Partially Recirculated DEIR for the Fairfax Conversion Project*) (see Response to Comment 13-5):

3.5-2 Impacts to prehistoric cultural resources.

The Northwest Information Center record search results indicated that the Fairfax Conversion Project site had not been previously surveyed, and that previously documented cultural resources did not exist on the site at the time of the record search. However, the records search noted that the project area should be considered to have a high likelihood of containing unrecorded prehistoric resources.

The NCRM Cultural Resources Assessment states that the archaeological survey resulted in the discovery of five prehistoric sites identified as Artesa Site-01, -02, -03, -04, and -05; as well as several isolates and noted finds. The various prehistoric resources discovered within the project area reflect both intensive and generalized use of the project area by prehistoric peoples. Of the five prehistoric archaeological sites Maximillian Neri recorded, consulting archaeologist Tom Origer evaluated only three, because at the time of the Origer investigations the site plan indicated that only three of the five would be impacted by the proposed project. Tom Origer & Associates conducted field research to better define the site limits and provide necessary information to assess the legal significance and integrity of archaeological sites -02, -03, and -05.

<u>Archaeological Sites Identified as Ineligible for Listing</u>

Artesa Site-03

The Artesa Site-03 is a prehistoric archaeological site. The site does not meet Criterion A(1) as the site does not have a demonstrable association with important events in our history. Criterion B(2) is also not met because the site is not associated with important individuals. Because the site does not have designed elements Criterion C(3) does not apply. Origer's investigation of the site revealed that it is marked by a paucity of archaeological specimens, which included chert and obsidian flakes, within a shallow matrix that had been previously disturbed by cultivation when this area was used as an orchard. The paucity of materials and lack of integrity indicate that the site does not have potential to yield data important in history or prehistory. Therefore, because the site does not meet Criterion D(4), it is not eligible for listing on the NRHP or the CRHR.

Archaeological Sites Identified as Eligible for Listing

Artesa Site-01

The Artesa Site-01 is a prehistoric archaeological site. The site does not meet Criterion A(1) as the site does not have a demonstrable association with important events in our history. Criterion B(2) is also not met because the site is not associated with important individuals. Because the site has no designed elements, Criterion C(3) does not apply. The Artesa Site-01 appears to retain fair to excellent surface integrity, and the site is very likely to contain an extensive sub-surface archaeological deposit. ~~Furthermore, the site is very possibly the Kashaya Pomo ethnographic village of Kabatui, which is known to have been present in the general vicinity, and that human remains may be present.~~ Therefore, the site meets Criterion D(4) for inclusion on the NRHP and CRHR, and has good integrity. As a result, the site should be excluded from vineyard development. The proposed project would not adversely affect Artesa Site-01, as the proposed site plan has been designed to exclude the site from the development area.

Artesa Site-02

The Artesa Site-02 is a prehistoric archaeological site. The site does not meet Criterion A(1) as the site does not have a demonstrable association with important events in our history. Criterion B(2) is also not met because the site is not associated with important individuals. Because the site has no designed elements, Criterion C(3) does not apply. The site contains a wide range of specimens including projectile points, bifaces, unifacial tools, chipped stone tool manufacture waste debris (e.g., chert and obsidian flakes), and grinding implements such as handstones and grinding slabs. Therefore, the site meets Criterion D(4) for inclusion on the NRHP and CRHR, and has good integrity. As a result, the site should be excluded from vineyard development. The proposed project would not adversely affect Artesa Site-02, as the proposed site plan has been designed to exclude the site from the development area.

Artesa Site-04

The Artesa Site-04 is a prehistoric archaeological site. Based on observation of artifacts visible on the ground surface within the site Neri initially determined that the site exhibited poor surface integrity due to previous mechanized impacts and resulting erosion, especially the slopes descending to the drainage in the western portion of the site, and extensive sub-surface deposits are unlikely to be present. However, pending additional evaluation of the resource by scientific means, this prehistoric site must be considered significant according to Criterion

A(1) as the site may have a demonstrable association with important events in our history. Criterion B(2) is not met because the site is not associated with important individuals. Because the site does not have designed elements Criterion C(3) does not apply. The lack of integrity indicates that the site does not have potential to yield data important in history or prehistory; therefore, the site does not meet Criterion D (4). However, as the site may be eligible under Criterion A(1), the site should be avoided. The proposed project would not adversely affect Artesa Site-04, as the proposed site plan has been designed to exclude the site from the development area.

Artesa Site-05

The Artesa Site-04 is a prehistoric archaeological site. The site does not meet Criterion A(1) as the site doe not have a demonstrable association with important events in our history. Criterion B(2) is also not met because the site is not associated with important individuals. Because the site does not have designed elements Criterion C(3) does not apply. The site is marked by a relatively wide variety of artifacts including projectile points, bifacial tools, (e.g., knives), unifacial tools (e.g., scrapers), a grooved stone net weight, steatite bowl fragment, handstones, grinding slabs, abundant chert tool knapping debris, obsidian tool knapping debris. The abundance and variety of materials and deep site matrix that appears to extend below any near-surface ground disturbance suggest that this site retains integrity. Therefore, the site does meet Criterion D(4) and is eligible for listing on the NRHP and the CRHR. The proposed project would not adversely affect Artesa Site-05, as the proposed site plan has been designed to exclude the site from the development area.

Additional Archaeological Sites Identified During Origer & Associates' July 2009 Survey

The results of Origer & Associates' July 2009 survey indicate that an additional six locations were identified for further consideration and analysis, five of which have been recommended for avoidance. During the survey effort, the newly found archaeological sites located within portions of the project area where improvements are planned, were subjected to shovel test pit exploration to better understand site boundaries (in addition, several shovel test pits were placed in the vicinity of Neri's Noted Find 05 and Noted Find 06 -- characterized by him as isolated artifacts -- to verify that there was no site present at either location). These six archaeological sites are only described generally below, due to the sensitivity of the information:

1. Artesa Parking Site: The archaeological materials observed at this site have similarities to those observed at Artesa Site-02 (P-49-0003016) and Artesa Site-05 (P-49-0003019). Both of these sites were found to be significant under Criterion D (4) on the NRHP and the CRHR; therefore, it is possible that this additional site could qualify as well. In addition to the CRHR and NRHP criteria, the site is significant under Criterion (e) of the criteria for a significant archaeological or historical site defined in Title 14, California Code of Regulations (CCR), Section 895.1 (the California Forest Practice Rules). The work area limits for the project have been revised to exclude this small site from any disturbance during project implementation. These revised work area limits are reflected in the latest Vineyard Plan presented in Chapter 1 of the Final EIR.

2. Bailing Wire Site. This site is located in one of the proposed reserves. The site has the potential to be significant under Criteria 1 and 4 of the CRHR, Criterion D of the NRHP, and Criterion (e) of the California Forest Practice Rules. Because it is in a protected area excluded from development no further investigation or evaluation is warranted at this time.

3. Artesa Crossing Site. The archaeological materials observed at this site are similar to those observed at Artesa Site-02 (P-49-0003016) and Artesa Site-05 (P-49-0003019). Both of these sites were found to be significant under Criterion D (4) of the NRHP and the CRHR; therefore, it is possible this site could qualify as well. In addition to the CRHR and NRHP criteria, the site is significant under Criterion (e) of the prescribed criteria for a significant archaeological or historical site defined in Title 14 CCR Section 895.1 of the California Forest Practice Rules. The work area limits for the project have been revised to exclude this small site from any disturbance. These revised work area limits are reflected in the latest Vineyard Plan presented in Chapter 1 of the Final EIR.

4. End of the Day Site. The archaeological materials observed at this site are similar to those observed at Artesa Site-02 (P-49-0003016) and Artesa Site-05 (P-49-0003019). Because both of these sites were found to be significant under Criterion D (4) of the NRHP and the CRHR, it is possible this site could qualify as well. In addition to the CRHR and NRHP criteria, the site is significant under Criterion (e) of the prescribed criteria for a significant archaeological or historical site defined in Title 14 CCR Section 895.1 of the California Forest Practice Rules. The work area limits for the project have been revised to exclude this small site from any disturbance. These revised work area limits are reflected in the latest Vineyard Plan presented in Chapter 1 of the Final EIR.

5. Among the additional cultural resources identified during Origer and Associates' July 2009 survey was a series of fence segments, some of which are aged, yet many portions appear to have been modified since their original construction and/or are now in a state of disrepair. The type, condition, lengths and appearance of these fence segments have been documented and no further evaluation is warranted. None of the fence segments appears to meet NRHP, CRHR, or California Forest Practice Rules criteria for significance.

6. The 1943 Annapolis 7.5-minute topographic map shows a road intersecting with Annapolis Road at the same location as Red Fern Valley Road extending south along the ridge until it reaches the Wheatfield Fork of the Gualala River. Field investigation of this road revealed that at about the 700-foot elevation line the road turns into a trail. Segments of this road are still extant within the project area and the remainder of the property. The portion of the road from its intersection with Annapolis Road through the property to the point where it turns west has been graded and widened. The remainder of the road through the property appears to have been modified during past logging activities and several segments of it are in disrepair.

   Although no documentation for the road's purpose has been found, its functions were likely:

   1. to provide access to portions of the property, possibly for logging
   2. to provide access to a portion of the Wheatfield Fork of the Gualala River

   Historical research did not yield any evidence that the road was associated with any events which contributed to local or regional history. While it is possible the road was used historically for logging, no clear evidence of this was found. The finding that a trail leads from the road to the river suggests that at least one purpose of the road was to provide access to the Wheatfield Fork of the Gualala River. Based upon these factors Origer & Associates proposed that the road does not meet Criterion A of the NRHP, Criterion 1 of the CRHR, or Criterion (c) of the prescribed criteria for a significant archaeological or historical site defined in Title 14 CCR Section 895.1 of the California Forest Practice Rules.

   Historical research did not yield any documentation that the road was specifically associated with any people found important to Annapolis, Sonoma County or California history, therefore Criterion (b) of the NRHP, Criterion 2 of the CRHR, and Criterion (c) of the prescribed criteria for a significant archaeological or historical site

defined in Title 14 CCR Section 895.1 of the California Forest Practice Rules has not been met.

Because the road is not a particularly good example of road construction, nor does it appear to contain any important information; it does not meet Criterion (c) of the NRHP, Criterion 3 of the CRHR, or Criterion (b) of the prescribed criteria for a significant archaeological or historical site defined in Title 14 CCR Section 895.1 of the California Forest Practice Rules.

The road is unlikely to yield data or information important to the history of Annapolis, Sonoma County, or California; therefore, it does not meet Criterion (d) of the NRHP, Criterion 4 of the CRHR, or Criterion (d) of the prescribed criteria for a significant archaeological or historical site defined in Title 14 CCR Section 895.1 of the California Forest Practice Rules.

The road as a physical, geographic feature does not contain information needed to answer important scientific research questions; therefore, Criterion (a) of the prescribed criteria for a significant archaeological or historical site defined in Title 14 CCR Section 895.1 of the California Forest Practice Rules has not been met.

The road was not found to have significant cultural or religious importance to Native Americans as defined in 14 CCR § 895.1; therefore, Criterion (e) of the prescribed criteria for a significant archaeological or historical site defined in Title 14 CCR Section 895.1 of the California Forest Practice Rules has not been met.

Consequently, the road does not meet NRHP, CRHR, or California Forest Practice Rules criteria for significance. Now that the road's description, condition and location have been documented, no further evaluation is warranted.

Conclusion

In summary, Artesa Site(s) -01, -02, -04 and -05 are important archaeological resources. As discussed previously the site plan shows that Artesa Site(s) -01, -02, -04 and -05 ~~have been~~ are to be avoided ~~in the vineyard design and~~ during implementation of the timberland conversion project ~~development process~~. Therefore, the sites would not be impacted by development and vineyard activities. Artesa Site -03 was identified by the archaeological consultants as being ineligible for inclusion on the NRHP or the CRHR. It should also be noted that, according to *An Archaeological Survey Report for the Artesa/Fairfax*

Timber Harvesting Plan," dated August 6, 2009 and revised May 6, 2010, in addition to Origer & Associates' evaluation using the CRHR and NRHP criteria, the site is not significant under any of the criteria for determining the significance of an archaeological or historic-era site listed in the California Forest Practice Rules. Walter Antone, Assistant THPO for the Kashia Band of Pomo Indians of Stewarts Point Rancheria, has also indicated that the tribe does not consider the site important.

In addition, two prehistoric isolates and five noted prehistoric finds were documented in Maximilian Neri's Cultural Resources Assessment. The isolates consisted of a single obsidian leaf-shaped biface (probable projectile point) fragment and a single double-sided metate fragment, both of which were discovered along roads. The noted finds were observed throughout the project site and included various Franciscan chert flakes, a single possibly modified blue-schist cobble, and a single Clear Lake Basin obsidian flake. The various discoveries are considered not to have a measurable degree of potential significance, as they simply reflect the widespread prehistoric use of the project area. The discovery of isolated prehistoric artifacts is a common occurrence throughout the region, and the isolates and noted finds encountered within the project area do not constitute particularly unique or diagnostic artifact types. However, the two prehistoric isolates have been collected and will be protected from possible project impacts. ~~According to~~ Neri~~,~~ proposed that none of the various isolates merit site- or area-specific mitigation measures, a finding that Origer and Associates confirmed.

Furthermore, the five additional archaeological sites identified by Origer & Associates and proposed as potentially significant during the July 2009 intensive re-survey of the entire project area will be protected via avoidance during project implementation, as set forth in Mitigation Measure 3.5-2(e) below. The currently proposed work area limits, as shown in the revised Vineyard Plan, ensure that these additional archaeological sites are not disturbed. As noted above, only two densely vegetated areas were not surveyed intensively in July 2009 by Origer & Associates; however, 8 of the 20 densely vegetated acres were subsequently surveyed by Origer & Associates in November 2010 and no cultural resources were found ("A Supplemental Cultural Resources Survey for the Artesa/Fairfax Timber Conversion, Sonoma County, CA," December 15, 2010). Yet, because 12 densely vegetated acres of the project site remain surveyed at a level that is less than intensive, the applicant has excluded these 12 acres from vineyard development. This reduction in the vineyard acreage has been reflected on the latest version of the Vineyard Plan exhibit, which is included in Chapter 1, Introduction, of this Partially Recirculated DEIR (see Figure 1-1).

Based upon the number of prehistoric Native American archaeological sites identified within the study area, the potential for the sites to comprise an archaeological district was considered. While these sites reflect substantial use of the study area, and are likely related by cultural and temporal affiliation, they are a fraction of the number of sites known and reported within the greater Annapolis area. Guidelines for delineating district boundaries recommend that such boundaries should encompass "…the full extent of the significant resources and land area" making up the district (NPS 1991).

The distribution of known and reported archaeological sites in the Annapolis area, outside the Fairfax Conversion property, suggests that an appropriate boundary for an "Annapolis Archaeological District" would include the land above the 600-foot contour interval on both Beatty Ridge and Brushy Ridge. This would be consistent with guidelines for establishing district boundaries, which recommend using natural topographic features such as ridges, and for large properties suggests the use of USGS contour lines as boundaries (NPS 1991:56). However, the NPS guidelines preclude the creation of a district comprising only the sites within a specific study area. While the creation of an "Annapolis Archaeological District" could help to highlight the research potential of the archaeological resources in the area, state and federal laws call for avoidance of all known cultural resources to the extent feasible. At present there is a lack of sufficient data to link the various prehistoric sites temporally or thematically as a District. While such analyses could be performed, doing so would likely result in further disturbance to these sites that are to be avoided during project implementation. Therefore, creation of an archaeological district would not afford the sites greater protection than they will receive as individual recorded archaeological sites that have been determined to be potentially significant under one or more of the relevant criteria for significant archaeological and/or historic-era sites.

Although the known significant archaeological sites ~~on~~ within the project ~~site~~ area are to ~~would~~ be avoided during project implementation, other portions of the project ~~site~~ area could contain ~~further~~ additional significant prehistoric sites that have yet to be discovered. ~~Furthermore, the potential exists that unknown human remains exist on the project site.~~ Ground-related construction activities could result in the ~~uncovering of undiscovered~~ discovery of presently unidentified cultural resources ~~and/or human remains~~. Therefore, implementation of the proposed project ~~would~~ could result in a ***potentially significant*** impact to unknown prehistoric cultural resources.

Mitigation Measure(s)
Implementation of the following mitigation measures would reduce project impacts to a *less-than-significant* level.

Based upon the CAL FIRE archaeologist's review of Origer & Associates' August 2009 report entitled *An Archaeological Survey Report for the Artesa/Fairfax Timber Harvesting Plan*, revised May 6, 2010, Mitigation Measures 3.5-2(a) of the DEIR, which already requires protection measures in the event archaeological resources are encountered during project construction, is hereby revised consistent with the language in Origer & Associates' May 6, 2010 report, to provide additional methodological details. In addition, Mitigation Measure 3.5-2(c) is hereby added to the DEIR (*as reflected in Chapter 3.5, Cultural Resources, of the Partially Recirculated DEIR for the Fairfax Conversion Project*), which serves to provide further details concerning required procedures to be carried out if/when previously unidentified resources are found during project construction (see Response to Comment 13-5):

3.5-2(a) ~~*In the event that any buried cultural resources (including, but not limited to: chipped chert and obsidian stone tools and tool manufacture waste flakes; grinding and hammering implements that look like fist-sized river tumbled stones; and/or locally darkened soil with artifacts, deposits of marine shell, dietary bone) are discovered during vineyard development activities, all work shall be halted within 50 feet of the find and a qualified consulting archaeologist, the Department of Forestry and Fire Protection Northern Region Headquarters Archaeologist and the Stewarts Point Tribal Historic Preservation Officer (THPO) shall be consulted in order to evaluate the materials and offer recommendations for their treatment. The decision about how to proceed shall be made through consultation among the consulting archaeologist, the Department of Forestry and Fire Protection Northern Region Headquarters Archaeologist and the Stewarts Point Rancheria THPO (or his designee) in coordination with the appropriate County representative. Appropriate treatment measures may include recording the resource with the Northwest Information Center of the California Historical Resources Inventory System database, data recovery excavation, analysis and reporting, and/or complete avoidance of the sites that have outstanding cultural or historic significance. A note requiring compliance with this measure shall be indicated on construction drawings and in construction contracts for the review and approval of the County Permit & Resource Management Department prior to issuance of grading permits.*~~

Prior to beginning any timber and/or ground disturbing operations within 100 feet of any of the significant

archaeological sites identified within and adjacent to the project area, the location of the fences to be constructed around them shall be determined through on-site consultation among the CAL FIRE Archaeologist, the project Registered Professional Forester (RPF), the project proponent's archaeological consultant and the Stewarts Point Rancheria THPO or his designee.

1. *There is a possibility that prehistoric or historical cultural materials may be uncovered during operations. Should this occur, operations within 100 feet of the discovery shall stop, the CAL FIRE archaeologist notified, and the other provisions of 14 CCR 929.3 implemented.*
2. *No collection of artifacts or cultural materials by project personnel is allowed.*
3. *The RPF of record shall communicate the above recommendations to the Licensed Timber Operator (LTO) prior to the start of operations.*

In keeping with applicable CEQA and Section 106 regulations, if archaeological site indicators are encountered during project implementation, work at the place of discovery shall be halted immediately until a qualified archaeologist can evaluate the finds (14 CCR §15064.5 [f] and 36CFR60.4). Prehistoric archaeological site indicators include but are not limited to: obsidian and chert flakes and chipped stone tools; grinding and mashing implements (e.g., slabs and handstones, and mortars and pestles); bedrock outcrops and boulders with mortar cups; and locally darkened midden soils. Midden soils may contain a combination of any of the previously listed items with the possible addition of bone and shell remains, and fire affected stones. Historic period archaeological site indicators generally include, but are not necessarily limited to: fragments of glass, ceramic, and metal objects; milled and split lumber; and structure and feature remains such as building foundations and discrete trash deposits (e.g., wells, privy pits, dumps). When historic period archaeological site indicators are encountered ground disturbing activities within 100 feet of the discovery location shall be halted immediately until a qualified archaeologist can evaluate the find(s) (14 CCR §15064.5 [f]).

3.5-2(b) *In the event that human remains are found during vineyard development activities, the steps required by 14 CCR Section*

15064.5(e) of the CEQA Guidelines shall be carried out. All excavation or disturbance of the location and any nearby area reasonably suspected to overlie adjacent human remains shall cease. The Sonoma County Coroner shall be immediately contacted. If the coroner determines the remains to be Native American applicable law and regulation require the coroner ~~is then required~~ to contact the Native American Heritage Commission within 24 hours. ~~The~~ Subsequently the Native American Heritage Commission is mandated to ~~shall~~ identify the person or persons it believes to be the most likely descended from the deceased Native American. The most likely descendant may then make recommendations to the landowner or the person responsible for the excavation work, regarding the treatment ~~for means of treating or disposing~~ of, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resources Code Section 5097.98. A note requiring compliance with this measure shall be indicated on construction drawings and in construction contracts for the review and approval of the County Permit & Resource Management Department prior to issuance of grading permits.

3.5-2(c) A. Pursuant to 14 CCR § 15126.4(b)(3)(C), if/when the CAL FIRE Archaeologist, the consulting archaeologist, and the Stewarts Point Rancheria THPO (or his designee) agree that data recovery through excavation is the only feasible mitigation for an archaeological site(s) discovered during project implementation, a data recovery plan (DRP) that makes provision for adequately recovering the scientifically important information from and about the site shall be prepared and adopted prior to any excavation being undertaken. The DRP shall, at a minimum, include:

1. *A thorough description and current assessment of the condition of each site where data recovery is proposed.*
2. *A description of the project with the areas of direct impact identified and the relationship of these areas of direct impact to the known archaeological site(s) clearly stated.*
3. *A summary of the California Forest Practice Rules and California Environmental Quality Act (CEQA) compliance situation and the management goals of the study, including, but not limited to, defining the areal extent of the site(s), describing the depth, range and characteristics of cultural material and natural*

strata present, and listing all cultural deposits sampled and/or excavated to date, to determine whether the cultural deposits possess the integrity and potential data to address questions important in prehistory or history, and to provide information necessary to establish what effect project implementation may have on these sites.

4. *Identification and description of the portion of each site where data recovery is to be undertaken.*
5. *Identification and description of the portion of each site that will be destroyed without data recovery.*
6. *Pertinent background information on the environment, paleoenvironment, ethnography, archaeology and history, as appropriate, to demonstrate familiarity with the project area and type(s) of site(s) under study, and to provide a context for the discussion of relevant regional research topics.*
7. *The research questions/research topics relevant to the sites with an explanation of their importance to regional prehistory and/or history.*
8. *The expected data categories, how they relate to each topic and the sample size necessary to provide adequate cultural material for analysis.*
9. *Field and analysis methods to be used, with an explanation of their relevance to the research domains.*
10. *Methods for evaluating and treating newly identified values. [Note: because situations may arise or data be encountered which were not anticipated in the research design, adequate provision shall be made therein for modification of the program to address unforeseen discoveries and/or other unexpected circumstances.]*
11. *Archaeological sites found to contain human remains shall be treated in accordance with applicable provisions of Section 7050.5 of the California Health and Safety Code and through consultation with the Stewarts Point Rancheria THPO (see also Mitigation Measure 3.5-2(b)).*
12. *Proposed disposition of recovered materials and records. Acceptable curation arrangements may include, but not necessarily be limited to:*
    a. *Return to the landowner in accordance with State private property rights if that is the landowner's expressed desire, AFTER description, study, and*

analysis in accordance with the DRP/research design are complete;

b. *Curation at a regional research center or appropriate public or private repository meeting the standards set forth in* ***Guidelines for the Curation of Archeological Collections*** *(State Historical Resources Commission 1993), provided reasonable access is guaranteed for future study]—following consultation about curation with the Stewarts Point Rancheria THPO.*

13. *Consideration of non-archaeological concerns (e.g., cultural concerns expressed by the Stewarts Point Rancheria THPO, the interests of the private property owner in maintaining the integrity of their property rights, any paleontological, geological, or related values that may be present in the site deposit(s); and/or the environmental integrity of the sites).*

B. *Before data recovery operations (and/or any subsurface archaeological treatment measures) are carried out, submit a draft of the DRP to the CAL FIRE Northern Region-Coast Area Archaeologist and the Stewarts Point Rancheria THPO and provide them a reasonable opportunity to review and comment. The DRP shall then be revised accordingly and a copy of the final DRP provided to the CAL FIRE Archaeologist and the Stewarts Point Rancheria THPO.*

C. *The CAL FIRE Archaeologist shall be notified a minimum of five (5) business days prior to beginning work under the terms of the approved DRP.*

D. *Once the DRP has been implemented, a final, confidential written archaeological report shall be prepared that contains, at a minimum, the reasons for the project, the data recovery plan, the methods employed in both field work and analysis, the data recovered, observations made, insights gained, conclusions reached, and a presentation of pertinent data. This report shall take into account the applicable recommendations set forth in* ***Preservation Planning Bulletin No. 4(a)****, Archaeological Resource Management Reports (ARMR): Recommended Contents and Format (Office of Historic Preservation, 1989). A draft of this report shall be submitted to the CAL FIRE Archaeologist and the Stewarts Point Rancheria THPO who shall be provided a reasonable opportunity to review and comment upon the draft report. Following this review, the final report shall be*

revised accordingly and two (2) copies provided to the CAL FIRE Archaeologist. In addition, copies shall be provided to the Stewarts Point Rancheria THPO and the Native American Heritage Commission if either party so requests.

Based upon comments from CAL FIRE archaeologist's review of Origer & Associates' August 2009 report entitled *An Archaeological Survey Report for the Artesa/Fairfax Timber Harvesting Plan*, revised May 6, 2010, Mitigation Measures 3.5-2(c) and (d) of the DEIR, which already require protection of Artesa Site(s) -01, -02, -04, and -05, are hereby revised consistent with the language in Origer & Associates' May 6, 2010 report, to provide additional methodological details (*as reflected in Chapter 3.5, Cultural Resources, of the Partially Recirculated DEIR for the Fairfax Conversion Project*):

~~*3.5-2(c) As recommended in the NCRM Cultural Resources Assessment, during project development and operation, the applicant shall restrict use of the seasonal road located to the immediate northwest of Artesa Site-01 to ingress and egress. Mechanical grading or widening of the road, parking, and turning around in this area shall not be permitted. Segments of the seasonal roadway within 100 feet of the site shall be fenced with highly visible and/or other appropriate measure(s). Measures shall be implemented prior to the beginning of logging operations. A note requiring compliance with this measure shall be indicated on construction drawings and in construction contracts for the review and approval of the County Permit & Resource Management Department prior to issuance of grading permits.*~~

3.5-2(d) ~~*In consultation with the Department of Forestry and Fire Protection Northern Region Headquarters Archaeologist and the Stewarts Point Rancheria THPO (or his designee) the applicant shall establish a conservation easement protecting Artesa Site(s) -01, -02, -04, and -05 prior to timber harvesting. Measures shall be taken by the project foreman throughout the process to ensure that construction and vineyard operation activities do not degrade the cultural significance of the site(s). Measures to be taken include: the placement of protective fencing prior to any activity within 100 feet of an archaeological site, and the education of all on-site workers. Preservation plans shall be submitted to the County Permit & Resource Management Department prior to issuance of grading permits.*~~

Artesa Site-01

1. *No project or ground disturbing activities or impacts of any kind shall take place within the site boundaries. The site shall be clearly marked with highly visible fencing by the consulting archaeologist and/or his qualified designee(s) - in consultation with the Stewarts Point Rancheria THPO or his designee - prior to and during all ground disturbing timber harvesting and vineyard development activities. This fencing shall be maintained as necessary throughout ground disturbing activities within 100 feet of the site boundary. This location shall be clearly plotted on the project maps with specific and clear notations that this area is NOT to be encroached upon. In so doing, however, this location shall NOT be specifically labeled or identified as an archaeological site on the project maps in order to keep the identity and location of the site confidential and thus protect the site from damage by artifact hunters or vandals.*

2. *Although re-use of the existing seasonal road located approximately 150-200 feet to the northwest of the site is permitted, such use is restricted to ingress and egress – there shall be no mechanical grading or widening of the road.*

3. *A minimum 4-inch thick layer of gravel or other similar, suitable road rock material shall be placed (and maintained at that thickness throughout operations) on the 500-foot long segment of existing dirt road near Artesa Site-01.*

4. *Ground disturbing activities taking place within 100 feet of the site shall be monitored by a professional consulting archaeologist and the Stewarts Point Rancheria THPO or his designee(s). Prior to beginning operations, the scope of the monitoring shall be determined in consultation with the CAL FIRE Archaeologist and the Stewarts Point Rancheria THPO or his designee. When artifacts and/or other site indicators are encountered during operations, ground disturbing activities within 100 feet of the find shall be halted, and the provisions of 14 CCR 929.3 implemented (which include promptly notifying the CAL FIRE Archaeologist about the find).*

Artesa Site-02:

1. *No project or ground disturbing activities or impacts of any kind shall take place within the site boundaries. The site shall be clearly marked by the consulting archaeologist and/or his qualified designee - in consultation with the Stewarts Point Rancheria THPO or his designee – with highly visible fencing prior to and during all ground disturbing timber harvesting and vineyard development activities. This fencing shall be maintained as necessary throughout ground disturbing activities within 100 feet of the site boundary. This location shall be clearly plotted on the project maps with specific and clear notations that this area is NOT to be encroached upon. In so doing, however, this location shall NOT be specifically labeled or identified as an archaeological site on the project maps in order to keep the identity and location of the site confidential and thus protect the site from damage by artifact hunters or vandals.*

2. *Ground disturbing activities taking place within 100 feet of the site shall be monitored by a professional consulting archaeologist and the Stewarts Point Rancheria THPO or his designee(s). Prior to beginning operations, the scope of the monitoring shall be determined in consultation with the CAL FIRE Archaeologist and the Stewarts Point Rancheria THPO. When artifacts and/or other site indicators are encountered during operations, ground disturbing activities within 100 feet of the find shall be halted, and the provisions of 14 CCR 929.3 implemented (which include promptly notifying the CAL FIRE Archaeologist about the find).*

Artesa Site-04:

1. *No project or ground disturbing activities or impacts of any kind shall take place within the site boundaries. The site shall be clearly marked by the consulting archaeologist and/or his qualified designee - in consultation with the Stewarts Point Rancheria THPO or his designee – with highly visible fencing prior to and during all ground disturbing timber harvesting and vineyard development. This fencing shall be maintained as necessary throughout ground disturbing activities within 100 feet of the site boundary. This location shall*

be clearly plotted on the project maps with specific and clear notations that this area is NOT to be encroached upon. In so doing, however, this location shall NOT be specifically labeled or identified as an archaeological site on the project maps in order to keep the identity and location of the site confidential and thus protect the site from damage by artifact hunters or vandals.

2. *Ground disturbing activities taking place within 100 feet of the site shall be monitored by a professional consulting archaeologist and the Stewarts Point Rancheria THPO or his designee(s). Prior to beginning operations, the scope of the monitoring shall be determined in consultation with the CAL FIRE Archaeologist and the Stewarts Point Rancheria THPO. When artifacts and/or other site indicators are encountered during operations, ground disturbing activities within 100 feet of the find shall be halted, and the provisions of 14 CCR 929.3 shall be implemented (which include promptly notifying the CAL FIRE Archaeologist about the find).*

Artesa Site-05:

1. *No project or ground disturbing activities or impacts of any kind shall take place within the site boundaries. The site shall be clearly marked by the consulting archaeologist and/or his qualified designee - in consultation with the Stewarts Point Rancheria THPO or his designee – with highly visible fencing prior to and during all ground disturbing timber harvesting and vineyard development activities. This fencing shall be maintained as necessary throughout ground disturbing activities within 100 feet of the site boundary. This location shall be clearly plotted on the project maps with specific and clear notations that this area is NOT to be encroached upon. In so doing, however, this location shall NOT be specifically labeled or identified as an archaeological site on the project maps in order to keep the identity and location of the site confidential and thus protect the site from damage by artifact hunters or vandals.*

2. *Ground disturbing activities taking place within 100 feet of the site shall be monitored by a professional consulting archaeologist and the Stewarts Point Rancheria THPO or*

his designee(s). Prior to beginning operations, the scope of the monitoring shall be determined in consultation with the CAL FIRE Archaeologist and the Stewarts Point Rancheria THPO. When artifacts and/or other site indicators are encountered during operations, ground disturbing activities within 100 feet of the find shall be halted, and the provisions of 14 CCR 929.3 shall be implemented (which include promptly notifying the CAL FIRE Archaeologist about the find).

As well, while the additional sites identified in Origer & Associates' May 6, 2010 report are to be protected via adjustments to the latest Vineyard Plan presented in Figure 1-1 of the Final EIR, out of an abundance of caution the following protection measures, as reviewed and approved by the CAL FIRE Archaeologist, are included after Mitigation Measure 3.5-2(d) of the DEIR (*as reflected in Chapter 3.5, Cultural Resources, of the Partially Recirculated DEIR for the Fairfax Conversion Project*):

3.5-2(e) Artesa Parking Site:

1 No project or ground disturbing activities or impacts of any kind shall take place within the site boundaries. The site shall be clearly marked by the consulting archaeologist and/or his qualified designee - in consultation with the Stewarts Point Rancheria THPO or his designee – with highly visible fencing prior to and during all ground disturbing timber harvesting and vineyard development. This fencing shall be maintained as necessary throughout ground disturbing activities within 100 feet of the site boundary. This location shall be clearly plotted on the project maps with specific and clear notations that this area is NOT to be encroached upon. In so doing, however, this location shall NOT be specifically labeled or identified as an archaeological site on the project maps in order to keep the identity and location of the site confidential and thus protect the site from damage by artifact hunters or vandals.

2 Ground disturbing activities taking place within 100 feet of the site shall be monitored by a professional consulting archaeologist and the Stewarts Point Rancheria THPO or his designee(s). Prior to beginning operations, the scope of the monitoring shall be determined in consultation with the CAL FIRE Archaeologist and the Stewarts Point Rancheria THPO. When artifacts and/or other site indicators are encountered during operations, ground disturbing activities within 100 feet of the find shall be

halted, and the provisions of 14 CCR 929.3 implemented (which include promptly notifying the CAL FIRE Archaeologist about the find).

Baling Wire Site:

1. *No project or ground disturbing activities or impacts of any kind shall take place within the site boundaries. Site boundaries shall be clearly marked by the consulting archaeologist and/or his qualified designee - in consultation with the Stewarts Point Rancheria THPO or his designee – with highly visible fencing prior to and during all ground disturbing timber harvesting and vineyard development activities. This fencing shall be maintained as necessary throughout ground disturbing activities within 100 feet of the site boundary. This location shall be clearly plotted on the project maps with specific and clear notations that this area is NOT to be encroached upon. In so doing, however, this location shall NOT be specifically labeled or identified as an archaeological site on the project maps in order to keep the identity and location of the site confidential and thus protect the site from damage by artifact hunters or vandals.*

2. *Ground disturbing activities taking place within 100 feet of the site shall be monitored by a professional consulting archaeologist and the Stewarts Point Rancheria THPO or his designee(s). Prior to beginning operations, the scope of the monitoring shall be determined in consultation with the CAL FIRE Archaeologist and the Stewarts Point Rancheria THPO. When artifacts and/or other site indicators are encountered during operations, ground disturbing activities within 100 feet of the find shall be halted, and the provisions of 14 CCR 929.3 implemented (which include promptly notifying the CAL FIRE Archaeologist about the find).*

Artesa Crossing Site:

1. *No project or ground disturbing activities or impacts of any kind shall take place within the site boundaries. Site boundaries shall be clearly marked by the consulting archaeologist and/or his qualified designee - in consultation with the Stewarts Point Rancheria THPO or*

his designee – with highly visible fencing prior to and during all ground disturbing timber harvesting and vineyard development activities. This fencing shall be maintained as necessary throughout ground disturbing activities within 100 feet of the site boundary. This location shall be clearly plotted on the project maps with specific and clear notations that this area is NOT to be encroached upon. In so doing, however, this location shall NOT be specifically labeled or identified as an archaeological site on the project maps in order to keep the identity and location of the site confidential and thus protect the site from damage by artifact hunters or vandals.

2. *Ground disturbing activities taking place within 100 feet of the site shall be monitored by a professional consulting archaeologist and the Stewarts Point Rancheria THPO or his designee(s). Prior to beginning operations, the scope of the monitoring shall be determined in consultation with the CAL FIRE Archaeologist and the Stewarts Point Rancheria THPO. When artifacts and/or other site indicators are encountered during operations, ground disturbing activities within 100 feet of the find shall be halted, and the provisions of 14 CCR 929.3 implemented (which include promptly notifying the CAL FIRE Archaeologist about the find).*

End of the Day Site:

1. *No project or ground disturbing activities or impacts of any kind shall take place within the site boundaries. Site boundaries shall be clearly marked by the consulting archaeologist and/or his qualified designee - in consultation with the Stewarts Point Rancheria THPO or his designee – with highly visible fencing prior to and during all ground disturbing timber harvesting and vineyard development. This fencing shall be maintained as necessary throughout ground disturbing activities within 100 feet of the site boundary. This location shall be clearly plotted on the project maps with specific and clear notations that this area is NOT to be encroached upon. In so doing, however, this location shall NOT be specifically labeled or identified as an archaeological site on the project maps in order to keep the identity and location of the site confidential and thus protect the site from damage by artifact hunters or vandals.*

2. *Ground disturbing activities taking place within 100 feet of the site shall be monitored by a professional consulting archaeologist and the Stewarts Point Rancheria THPO or his designee(s). Prior to beginning operations, the scope of the monitoring shall be determined in consultation with the CAL FIRE Archaeologist and the Stewarts Point Rancheria THPO. When artifacts and/or other site indicators are encountered during operations, ground disturbing activities within 100 feet of the find shall be halted, and the provisions of 14 CCR 929.3 implemented (which include promptly notifying the CAL FIRE Archaeologist about the find).*

3. *All trees within 100 feet of the site boundary that are to be harvested shall be felled and skidded away.*

4. *If management of the trees within the site boundaries to minimize shading of the future surrounding vineyard is necessary, specific measures to prevent damage to the site shall be proposed by the RPF as an amendment to the THP.*

Mendocino Redwood Company Property Site:

1. *Ground disturbing activities within 100 feet of the property corner near where this site was found shall be monitored by a professional archaeologist and the Stewarts Point Rancheria THPO or his designee.*

2. *The scope of the monitoring operations shall be included in the Monitoring Plan prescribed in Mitigation Measure 3.5-3(a).*

3. *Whenever a previously unidentified prehistoric or historic archaeological site is found during operations, ground disturbance within 100 feet of the find shall stop, the Department Archaeologist shall be immediately notified and the other provisions prescribed in 14 CCR 929.3 [949.3, 969.3] implemented.*

The above changes to DEIR Mitigation Measures 3.5-2(a, c, and d) are for clarification purposes based upon additional field investigation conducted by the project archaeologist in concert with the lead agency, CAL FIRE. Mitigation Measures 3.5-2(a) through (e), including the above-outlined changes, have been included in the DEIR out of an abundance of caution, in that the work area limits for the project, as presented on the Vineyard Plan in Figure 1-1 of this Final

EIR, already ensure the avoidance of all archaeological sites determined to be potentially eligible for inclusion on the NRHP or the CRHR. Therefore, these changes do not affect the adequacy of the previous environmental analysis of cultural resources in the DEIR.

Mitigation Measure 3.5-3(a) is hereby revised as follows (see Response to Comment 10-44):

3.5-3(a) *Prior to ~~the issuance of grading permits~~ initiation of timber harvest operations, the applicant shall hire a qualified archeologist to prepare an archaeological monitoring plan for the review and approval ~~of the County Permit and Resource Management Department~~. by the CAL FIRE Northern Region-Coast Area Archaeologist and the Stewarts Point Rancheria THPO ~~(or his representative).~~ ~~At a minimum the plan shall cover the Neri "Noted Find" locations and all areas within 100 feet of previously identified archaeological sites, including those sites.~~ The plan shall include, but not necessarily be limited to the following measures:*

- *~~Any location with prehistoric Native American material shall require both a~~ Native American monitor(s) (representing the Stewarts Point Rancheria tribe and designated by the Stewarts Point Rancheria THPO) and an archaeological monitor(s) shall be present during all earth-moving activities associated with the proposed project.*
- *Historical features shall be considered historically significant if the feature is a discrete deposit identifiable to the period of significance for the two mills, or if the deposit relates to substantially earlier occupation and the agricultural activities on the project site.*
- *Prehistoric Native American deposits shall be considered an archaeological site if three or more cultural items are found within an area measuring roughly ten feet on a side.*
- *Archaeological deposits that retain a strong focus, that is the ability to clearly represent the activities that created the deposit, shall be considered to have sufficient integrity to meet the criteria for listing on the National Register.*
- *Identified sites shall be avoided by establishing construction fencing around the perimeter of ~~the~~ each site designated for this type of protection to prevent damage from vineyard development activities. Vineyard workers shall be trained regarding the importance of cultural materials.*
- *If the resources cannot remain in situ, ~~a program of investigation appropriate to the resource shall be developed. To the extent feasible, exiting research designs shall be incorporated into investigation programs.~~ Mitigation Measure 3.5-2(c) shall be implemented (i.e., Data Recovery Plan).*

> ~~*The Tribal Historic Preservation Officer for the Kashia Band of Pomo Indians has provided general information regarding the Kashia needs for monitoring and treatment of human remains. It is recommended that the project applicant enter into an agreed treatment plan with the tribe prior to beginning any ground disturbing activities in the project area.*~~

The revisions provide clarification only, and do not change the conclusions of the DEIR.

Minor revisions have also been made to Mitigation Measure 3.5-3(b), as follows:

> *3.5-3(b)* *Prior to ~~the issuance of grading permits~~ initiation of timber harvest operations, an archeological monitor shall be hired by the applicant and approved by ~~the County Permit & Resource Management Department~~ the CAL FIRE Northern Region-Coast Area Archaeologist to train the timber harvest crew, and subsequently, the vineyard construction ~~grading~~ crew prior to commencement of ground disturbing activities ~~logging and grading activity~~ in regard to the types of artifacts that they ~~are likely to~~ may find (including, but not limited to, ceramics/pottery, glass and/or metal artifacts and fragments, building foundations, linear features such as railroad grades, wells, privies, trash pits). In the event that an artifact is discovered, all work shall cease within ~~50~~100 feet of the discovery until the archaeological monitor(s) has evaluated the find. The archaeological monitor(s) shall promptly consult with the ~~Department of Forestry and Fire Protection~~ CAL FIRE Northern Region Headquarters Archaeologist. ~~Work shall not occur within 50 feet of the find until a decision about how to proceed has been made through consultation among the consulting archaeologist and the Department of Forestry and Fire Protection Northern Region Headquarters Archaeologist, in coordination with the appropriate County representative. Appropriate treatment measures may include recording the resource with the Northwest Information Center of the California Historical Resources Inventory System database, and/or complete avoidance of the sites that have outstanding cultural or historic significance. A note requiring compliance with this measure shall be indicated on construction drawings and in construction contracts for the review and approval of the County Permit & Resource Management Department prior to issuance of grading permits.~~ If the resources cannot remain in situ, Mitigation Measure 3.5-2(c) shall be implemented (i.e., Data Recovery Plan).*

The revisions provide clarification only, and do not change the conclusions of the DEIR.

3.6 Geology

Since the release of the DEIR for public review, CAL FIRE detected an inadvertent error in the title of the responsible entity listed in Mitigation Measure 3.6-2. In addition to this minor clarification to Mitigation Measure 3.6-2 on page 3.6-14 of the DEIR, CAL FIRE has been added to this mitigation measure as a responsible entity.

> *3.6-2* *Prior to the issuance of grading permits, the applicant shall provide a final geotechnical report to the Sonoma County Permit and Resource ~~Development~~ Management Department and CAL FIRE that addresses the entire reservoir area. All of the recommendations in the final geotechnical report shall be incorporated into the construction plans for the reservoir.*

The revisions provide clarification only, and do not change the conclusions of the DEIR.

3.7 Hydrology and Water Quality

As discussed in the "Project Description" section above on page 2-7 of this chapter, Comment Points 8 and 9 have been deleted from Figure 2-12, "Timberland Conversion Operations Map," of the DEIR because they are no longer included in the project per agency recommendations made during the on-site pre-harvest inspection (PHI). As a result, Mitigation Measure 3.7-2 of the DEIR has been revised to delete the previously proposed improvements associated with Comment Points 8 and 9.

> ~~*3.7-2(c) Fill material for the two temporary truck crossings shall be removed from the watercourse channel to form channels that are as close to the natural grade and orientation as possible. The constructed channels shall be wider than the existing channels. The excavated material and any resulting cut banks shall be sloped back from the channel and stabilized to prevent slumping and to minimize soil erosion. The two temporary truck crossings shall be removed subsequent to the completion of timber operations. The disturbed soil on the approaches to the crossings shall be seeded and mulched prior to October 15 of the first timber harvesting season.*~~

The remaining sub-components of Mitigation Measure 3.7-2 have been renumbered to account for the deletion of 3.7-2(c).

Changes to Chapter 3.7 as a result of the revised Hydrologic Analysis for the Project

Due to the reduction in the net vineyard acreage since the release of the Fairfax Conversion DEIR, O'Connor Environmental has made the necessary revisions to the Fairfax Conversion Hydrologic Analysis to reflect these circumstances. Because Chapter 3.7, *Hydrology and Water Quality*, of the DEIR is based upon O'Connor Environmental's technical reports for the project, this chapter has been revised in the following sections to reflect the corresponding changes in O'Connor Environmental's technical report. More specifically, Table 3.7-14 and the

accompanying text has been revised to reflect the reduced vineyard acreage, which has resulted in the following key changes to the previously presented project peak flow estimates:

- Elimination of proposed vineyard unit 8c resulted in large reductions in predicted peak flow increase and channel erosion potential at two hydrologic assessment nodes:
    - Predicted peak flow increases at drainage nodes N35 (percent increase in peak flow reduced from 24% to 5%) and N37 (percent increase in peak flow reduced from 32% to 0%).
    - Corresponding to reductions in peak flow increase at drainage nodes N35 and N37, sensitivity to peak flow (channel erosion potential) was reduced from moderate to low for drainage channels 35, 36 and 38.
- Small reductions in vineyard acreage at various locations resulted in small reductions in predicted peak flow increase at four hydrologic assessment nodes:
    - Predicted peak flow increases at drainage nodes N07, N31, N33 and N40 were reduced by 1 to 4%.
    - Small reductions in peak flow increase at these four locations did not result in a change in sensitivity to peak flow; the largest reduction (4%) occurs at N40, where peak flow increase was reduced to 18% from 22%.
- Small changes in vineyard acreage at various locations resulted in no change in predicted peak flows at drainage nodes N30 and N50.

As a result, the original conclusions of the Fairfax Conversion DEIR pertaining to vineyard-related erosion and sedimentation remain valid; and as the above summary and below revisions demonstrate, the project is now predicted to result in decreased peak flows compared to that which was predicted in the original DEIR analysis.

Impact 3.7-3, *Impacts to surface water quality from vineyard-related erosion and sedimentation*, under the heading "Project Peak Flows," starting on page 3.7-61 of the DEIR, is hereby revised as follows:

<u>Project Peak Flows</u>

Project Boundary Estimates

Changes in topography and runoff management in the vineyard are expected to change surface flow paths relative to existing site conditions. Furthermore, removal of forest vegetation is expected to result in increased run-off rates. As a result, increases in winter peak flows could occur.

The O'Connor runoff analysis estimated the magnitude of peak flows pre- and post-project at several points around the project site where concentrated and/or dispersed runoff would be routed by the vineyard drainage system. The drainage nodes are shown in Figure 3.7-2. Calculated drainage areas and vegetation types for existing and proposed conditions and estimated design storm peak discharge for existing and proposed conditions and percentage change in discharge are summarized in Table 3.7-14.

Table 3.7-14
Existing and Post-Project Peak Flows (Estimated 2-yr Recurrence Interval Flows)

		Existing Conditions		Proposed Project Conditions		Peak Discharge		
Drainage Node	**Total Area (ac)**	**Woodland (ac)**	**Grassland & Cultivated (ac)**	**Woodland (ac)**	**Grassland & Cultivated (ac)**	**Existing (cfs)**	**Proposed Project (cfs)**	**% change**
N01	23.0	22.1	0.8	13.0	9.9	12.3	13.9	13%
N07	41.9	41.9	0	~~21.6~~22.5	~~20.3~~19.4	22.1	25.7	~~16~~15%
N17	12.6	12.6	0	4.3	8.2	6.6	8.1	22%
N20	40.8	19.6	21.2	9.4	39.1 [a]	25.2	25.8 [b]	2% [b]
N26	5.8	5.8	0	1.2	4.6	3.1	3.9	26%
N30	22.3	10.7	11.6	~~3.7~~4.1	18.~~6~~2	13.8	15.0	9%
N31	38.8	36.1	2.7	27.~~1~~9	~~11.7~~10.9	21.0	22.~~5~~4	~~8~~7%
N33	10.5	10.5	0	~~5.6~~6.0	~~4.9~~4.5	5.5	6.4~~3~~	~~16~~15%
N35	3.5	3.5	0	~~0.9~~3.4	~~2.6~~0.1	1.8	~~2.3~~1.9	~~24~~5%
N37	8.0	8.0	0	~~0.3~~8.0	~~7.8~~0	4.2	~~5.6~~4.2	~~32~~0%
N40	6.9	6.9	0	~~2.3~~3.1	~~4.6~~3.8	3.6	4.4~~3~~	~~22~~18%
N45	27.8	27.8	0	6.5	13.5 [a]	14.7	12.9 [a]	-12% [a]
N50	111.2	58.4	52.8	~~47.5~~48.3	~~63.7~~62.9	68.0	69.9	3%
N20+N50	151.9	77.9	74.0	56.9	102.8	93.2	95.7 [b]	3% [b]
N56	27.2	22.7	4.5	18.7	8.5	15.2	15.9	5%
N60	12.1	11.9	0.3	3.9	13.2 [c]	6.5	11.4 [c]	76% [c]
N61	20.8	6.1	14.7	6.1	14.7	13.6	13.6	0%
N62	9.5	9.5	0	7.0	2.4	5.0	5.4	9%
N63	6.6	2.5	4.1	0.1	1.5 [c]	4.2	1.1 [c]	-73% [c]
Total	429.2	316.5	112.7	179.4	249.8			
					Total-Reservoir Filling	**246.5**	**~~263.9~~261.4** [b]	**~~7~~6%** [b]
					Total-Reservoir Full, No Spill	**246.5**	**~~270.6~~268.1**	**~~10~~9%**

Notes: a) 7.8 acres of contributing area in Drainage Node 45 is diverted to Drainage Node 20 for reservoir supply.
b) Assumes 6.7 cfs of peak flow (pump capacity of 3000 gpm) diverted to reservoir at Node 20 with no spill from reservoir.
c) 5.0 acres in Drainage Node 63 diverted to Drainage Node 60 for treatment in sedimentation basin.

The largest flow increase is about 76 percent at Drainage Node 60 and results from diversion of runoff from about 5 acres to a proposed sedimentation basin to minimize potential delivery of sediment from vineyard fields to stream courses. The next largest peak flow increase is ~~32~~ 26 percent at Drainage Node ~~37~~26, and several other drainages are predicted to experience peak flow increases less than ~~between~~ 20 ~~and 30~~ percent. These predicted increases result from a relatively high proportion of conversion area in the watersheds contributing runoff to those drainage nodes.

The large decrease (-73 percent) at Drainage Node 63 results from the diversion of 5 acres of contributing area to Drainage Node 60. The 5 acre of drainage area is a large proportion of the total drainage area for Drainage Node 63. The decrease in peak flow at Drainage Node 45 (-12 percent) reflects the diversion of 7.8 acres of watershed to the reservoir collection system located in Drainage 20;

7.8 acres represents a modest proportion of the drainage area for Drainage Node 45.

The project reservoir is located in the watershed of Drainage Node 20. During the period of reservoir filling, runoff collected in the reservoir sump (located very near to Drainage Node 20) would be pumped to the reservoir at a maximum rate of 6.7 cfs (3,000 gpm). A small increase (2 percent) in design storm peak flow is predicted at Drainage Node 20 during periods of reservoir filling. At Drainage Node 50, including runoff from Drainage Node 20 (N20 + N50 in Table 6), peak flow increase is estimated to be about 3 percent when the reservoir is filling. When the reservoir is full, drainage to the reservoir sump is routed through from the sump to the bedrock channel at the bottom of Drainage 20. In this scenario, peak flow would increase about 29 percent at Drainage Node 20. At Drainage Node 50, with the increased runoff at Drainage 20 included, peak runoff is predicted to be about 10 percent.

The runoff collection system in the watershed above Drainage Node 20 will substantially reduce surface flows in the channel draining this area. Under existing conditions, the 2-yr recurrence interval design flow is about 25 cfs; under project conditions, the design flow would decrease to about 5 cfs. This flow reduction is expected to substantially reduce channel and bank erosion in this drainage and is discussed in greater detail in the Erosion Analysis.

Overall peak flow for the analysis area in aggregate increases about ~~10~~ 9% if the reservoir is full and runoff is routed through the sump to Drainage Node 20. If the reservoir is being filled, then the aggregate change in peak runoff is an increase of about ~~7~~ 6 percent.

Changes to Chapter 3.7 as a result of the revised Erosion Analysis for the Project

Due to the elimination of erosion mitigation site 7 from the project description for the above-described reasons, the reduction in the net vineyard acreage since the release of the Fairfax Conversion DEIR, and the detection of an inadvertent error in arithmetic affecting reported sediment yield from the project area, O'Connor Environmental has made the necessary revisions to the Fairfax Conversion Erosion Analysis to reflect these circumstances. Because Chapter 3.7, *Hydrology and Water Quality*, of the DEIR is based upon O'Connor Environmental's technical reports for the project, this chapter has been revised in the following sections to reflect the corresponding changes in O'Connor Environmental's technical report. More specifically, the slope class acreages in Table 3.7-19 of Chapter 3.7 have been revised due to reduction in vineyard acreage affecting the distribution of soil types and slope classes in proposed vineyard areas. In addition, the sediment yields for the project area in Table 3.7-20, which take into account the proposed sedimentation basins for the project, have been revised due to sediment yield changes predicted as a result of changes in Table 3.7-19 and due to an arithmetic error that double-counted sediment yield from grassland acreage that had been converted to vineyard, thereby overstating post-project sediment yield from the natural grassland cover type. As a result, the low and high range estimates of change in sediment yield for the project area in the

Fairfax Conversion DEIR and original O'Connor Environmental Erosion Analysis of 10.6 to 11.4 t/yr have been revised to 7.6 to 12.5 t/yr for the above-described reasons.

The sediment yields for Patchett Creek in Table 3.7-21 have also been revised for the above-described reasons. As a result, the low and high range estimates for Patchett Creek sediment yield in the Fairfax Conversion DEIR and original O'Connor Environmental Erosion Analysis of 547 to 807 t/yr have been revised to 533 to 789 t/yr.

Erosion mitigation work proposed for the project has been reduced because Mitigation Site 7 proposed in the Fairfax Conversion DEIR and original O'Connor Environmental Erosion Analysis was found to be located on an adjoining parcel during the THP PHI process. Mitigation at this location was completed by the owner of the adjoining parcel at the request of CAL FIRE. Consequently, low and high range estimates of erosion mitigation on the project site reported in the Fairfax Conversion DEIR and original O'Connor Environmental Erosion Analysis of 21 to 31 t/yr have been revised to 16 to 27 t/yr owing to the change at Mitigation Site 7.

However, considering the modifications to sediment yield estimates described above, the overall net reduction in low and high range sediment yield in the Fairfax Conversion DEIR and original O'Connor Environmental Erosion Analysis of 10 to 21 t/yr have been revised to 24 to 39 t/yr.

As a result, the original conclusions of the Fairfax Conversion DEIR pertaining to vineyard-related erosion and sedimentation remain valid; and as the above summary and below revisions demonstrate, the project is now predicted to result in an even greater decrease in existing erosion rates compared to that which was predicted in the original DEIR analysis.

Impact 3.7-3, *Impacts to surface water quality from vineyard-related erosion and sedimentation*, under the heading "Sediment Yields at Project Boundaries," starting on page 3.7-67 of the DEIR, is hereby revised as follows:

Table 3.7-19
Proposed Slope Class Acreages

Proposed vineyard, Goldridge soil, drainage to sediment basin				
Slope Class	**4%**	**8%**	**12%**	**16%**
Unnamed tributaries	0.2	0.5	0.9	4.4
Grasshopper	~~1.5~~1.3	~~2.5~~2.4	~~2.5~~2.4	~~4.8~~4.5
Patchett Creek	~~3.6~~2.9	~~7.0~~5.6	~~9.9~~8.0	~~20.6~~13.0
Proposed vineyard, Goldridge soil, normal drainage				
Slope Class	**4%**	**8%**	**12%**	**16%**
Unnamed tributaries	1.2	1.~~5~~4	1.~~4~~3	~~4.1~~3.5
Grasshopper	0.~~7~~6	1.~~1~~0	1.3	7.~~2~~1
Patchett Creek	0.~~7~~6	~~2.1~~1.9	3.~~4~~1	~~8.9~~7.5
Proposed vineyard, Hugo soil, drainage to sediment basin				
Slope Class	**4%**	**8%**	**12%**	**16%**
Patchett Creek	4.~~4~~3	6.~~5~~3	~~7.0~~6.8	~~25.1~~24.4
Proposed vineyard, Hugo soil, normal drainage				
Slope Class	**4%**	**8%**	**12%**	**16%**
Patchett Creek	~~2.0~~1.4	~~3.3~~2.4	~~3.7~~2.7	~~16.1~~12.9
Existing vineyard, Goldridge soil, drainage to sediment basin				
Slope Class	**5%**	**15%**	**25%**	**35%**
Patchett Creek	0.2	1.2	1.0	0.2
Existing vineyard, Goldridge soil, natural drainage				
Slope Class	**5%**	**15%**	**25%**	**35%**
Patchett Creek	3.8	17.3	8.1	2.5
Forest, Goldridge soil				
Slope Class	**5%**	**15%**	**25%**	**35%**
Unnamed tributaries	1.~~6~~7	~~2.8~~3.5	2.6	8.1
Grasshopper	~~2.9~~3.3	7.~~4~~9	6.5	11.7
Patchett Creek	~~8.3~~10.6	~~27.8~~38.4	18.4	21.5
Forest, Hugo soil				
Slope Class	**5%**	**15%**	**25%**	**35%**
Patchett Creek	~~3.7~~5.6	~~10.9~~16.0	11.9	33.6
Grassland (pasture), Goldridge soil, natural drainage				
Slope Class	**5%**	**15%**	**25%**	**35%**
Unnamed tributaries	0.2	0.3	0.1	0.0
Grasshopper	0.3	0.8	0.1	0.0
Patchett Creek	10.~~7~~9	22.~~1~~7	3.8	1.4
Grassland (pasture), Goldridge soil, drainage to sediment basin				
Slope Class	**5%**	**15%**	**25%**	**35%**
Patchett Creek	4.1	8.5	1.5	0.5

Source: O'Connor Environmental, Erosion Analysis, May 2008, Revised February 2011.

The estimated sediment yield from surface erosion for the project site (shown in Figure 3.7-5, including adjacent non-project vineyards) draining to Patchett Creek is summarized in Table 3.7-20. Sedimentation basins as designed are predicted to reduce sediment yield by 50 percent, primarily by capturing sand and fine gravel greater than 0.1 mm diameter. Finer suspended sediment that passes through the sediment basins is relatively mobile in energetic stream systems such as Patchett Creek. Most of the sediment from the project site, following treatment in sedimentation basins, is expected to remain in the water column as the sediment is transported through Patchett Creek with relatively little deposition. As shown in Table 3.7-20, the sedimentation basins (and the reservoir collection system) reduce the predicted increase in sediment yield of about 5 to 7 t/yr to a net decrease of about 8 to 13 t/yr~~by about two-thirds,~~. There is ~~leaving~~ an estimated net ~~increase~~ decrease at the project area boundary draining to Patchett Creek of approximately ~~11 tons per year, an increase of~~ 10~~12~~ to ~~14~~13 percent. Additional reductions in sediment yield by erosion mitigation designed to repair and control gully erosion at five sites in the project area is expected to reduce erosion rates by at least ~~21~~ 16 t/yr (low range estimates) to ~~31~~ 27 t/yr (high range estimates). These estimated sediment savings result in net decreases in sediment yield under project conditions of ~~10~~ 24 to ~~21~~ 39 t/yr.

Table 3.7-20
Sediment Yield for Project Area*

Existing Conditions			
Cover Type	**Drainage Type**	**Low Estimate (t/yr)**	**High Estimate (t/yr)**
Non-project Vineyard	Natural	17.4	17.4
Grassland	Natural	58.7	77.7
Forest	Natural	0.28	0.3
Total		**76.4**	**95.4**
Project Conditions			
Project Vineyard	Natural	~~9.8~~7.9	~~11.3~~9.2
Sed. Basin		~~18.8~~16.3	~~22.6~~18.9
Non-project Vineyard	Natural	16.0	16.0
Sed. Basin		1.4	1.4
Grassland	Natural	~~42.9~~30.2	~~56.7~~39.9
Sed. Basin		~~15.8~~11.4	~~21.0~~15.0
Forest	Natural	0.~~3~~2	0.~~3~~2
Total Sediment Yield		**~~105.0~~83.4**	**~~129.3~~100.6**
Total-Sed. Yield with Sed. Basin Mitigation		**~~87.0~~68.8**	**~~106.8~~82.9**
Change in Sediment Yield		~~28.6~~7.0	~~33.9~~5.2
Change in Yield, Sed. Basin Mitigation		~~10.6~~-7.6	~~11.4~~-12.5
% Change in Sediment Yield		~~37~~9.2%	~~36~~5.4%
% Change in Yield, Sed. Basin Mitigation		~~14~~-10%	~~12~~-13%

*Project area is shown in Figure 3.7-5, and includes existing non-project vineyards.

Source: O'Connor Environmental, Erosion Analysis, May 2008, Revised February 2011.

Patchett Creek Sediment Yield Estimates – Method 1 (Using Existing Data and Field Observations)

The erosion analysis conducted by O'Connor Environmental then analyzed the sediment yield in relation to sedimentation within the Patchett Creek watershed. The estimated sediment yield for Patchett Creek is summarized in Table 3.7-2~~0~~1, including estimated surface erosion from the project site using RUSLE2 for both existing and project conditions. Estimated sediment yield from the proposed project site decreases by about ~~10~~ 24 to ~~21~~ 39 t/yr for low and high range estimates, respectively. This represents a decrease of from ~~1.8~~4.3 to ~~2.4~~4.8% for low range and high range existing conditions sediment yield estimates, respectively.

Sediment yield under project conditions is reduced owing to design mitigations and other sediment mitigation to repair and prevent gully erosion on the project site (discussed below). Sediment yield from vineyard fields has been largely controlled by erosion control practices, and further limited by construction of sedimentation basins at vineyard drainage outfalls. Sedimentation basins reduce estimated vineyard erosion ~~by about two-thirds~~ below pre-project levels (Table 3.7-20), resulting in a net ~~increase~~ decrease in sediment yield of about ~~11~~ 8 to 13 t/yr. Additional reductions in sediment yield by erosion mitigation designed to repair and control gully erosion at five sites in the project area is expected to reduce erosion rates by at least ~~21~~ 16 t/yr (low range estimates) to ~~31~~ 27 t/yr (high range estimates). These estimated sediment savings result in net decreases in sediment yield under project conditions of ~~10~~ 24 to ~~21~~ 39 t/yr (See Table 3.7-21).

Table 3.7-21
Existing Sediment Budget for Patchett Creek

Erosion Source or Process	Low range Rate t/yr	High Range Rate t/yr
Bank erosion, ordinary slope conditions	133	133
Bank erosion in rockslides	66	131
Shallow landslides	77	77
Active gullies in project area	25	40
Roads; surface and point source	180	352
Existing vineyards and orchards	17	17
Existing pastures and abandoned orchards	59	78
Total-Existing Conditions	**557**	**828**
Estimated Natural	**244**	**309**
Total-Project Conditions	**~~547~~533**	**~~807~~789**

Source: O'Connor Environmental Erosion Analysis, May 2008, Revised Feburary 2011.

Specific mitigation measures that have been incorporated into the project design to reduce overall sedimentation rates in the project area by ~~10~~ 24 to ~~21~~ 39 tons/year are described below.

Patchett Creek Sediment Yield Estimates – Method 2 (Application of Sediment Input Rates Developed For Wheatfield Fork Sub-watershed in the Gualala Sediment TMDL to Patchett Creek on a Unit-Area Basis)

This approach uses watershed scale erosion rates for the Wheatfield Fork for specified erosion processes as per (RWQCB 2001, Table 6.1, p. 98), and applies them to the 1.76 mi^2 drainage area of Patchett Creek. In the following list, the first two items represent the natural erosion rate (380 $t/mi^2/yr$), while the remaining six comprise the human-caused erosion rate (810 $t/mi^2/yr$):

- Natural mass wasting (180 $t/mi^2/yr$)
- Stream bank erosion (200 $t/mi^2/yr$)
- Road related mass wasting (310 $t/mi^2/yr$)
- Road-stream crossing failures (40 $t/mi^2/yr$)
- Road related gullying (210 $t/mi^2/yr$)
- Road related surface erosion (120 $t/mi^2/yr$)
- Skid trail surface erosion (20 $t/mi^2/yr$)
- Other harvest related delivery (110 $t/mi^2/yr$)

Applying these rates to the Patchett Creek watershed (1.76 mi^2) yields mean annual natural sediment inputs and human-caused inputs of 669 t and 1,426 t, respectively. The total estimated erosion rate for Patchett Creek using this method is about 2,090 t/yr. This is roughly 3 to 4 times greater than the erosion rate estimated using data specific to Patchett Creek.

Erosion Control and Remediation Measures to be Implemented on the Project Site

As outlined in the Project Description, the sediment yield under project conditions would be reduced owing to design mitigations and other mitigations to repair and prevent gully erosion on the project site. The project reservoir collection system would largely eliminate runoff to a 1,200 ft reach of Class III channel immediately south of the proposed reservoir site. The channel has developed in an abandoned road or tractor trail. The channel erosion and bank creep processes in this section of channel are expected to be significantly reduced under project conditions. Based on an estimated 75% reduction in creep rate for this section of stream channel, mean annual sediment yield would be reduced by 1.7 t/yr.

The reservoir collection system would also largely eliminate storm runoff delivered to two large gullies located between the proposed reservoir and reservoir sump. To further mitigate erosion from these gullies, interception drains would be installed along the vineyard perimeter above these gullies to curtail

seepage erosion processes in the gullies. The reduction in water delivered to these gullies is expected to eliminate significant erosion processes. Based on estimated reduction in erosion rates in these gullies of at least 75%, mean annual sediment yield would be reduced by 8.3 to 15.8 t/yr for the low range and high range estimates respectively.

Significant gully erosion existing on the project site under current conditions was observed at three additional locations affecting existing temporary or abandoned roads. Erosion rates for these gullies were estimated based on field observations to total 14.1 to 17.7 t/yr for low range and high range estimates, respectively. Project mitigation for erosion at these sites would be implemented to correct inadequate drainage conditions that have caused gully erosion. Based on estimated reduction in erosion rates in these gullies of at least 75%, mean annual sediment yield would be reduced by ~~10.6~~6.0 to ~~13.3~~8.7 t/yr for the low and high range estimates, respectively.

Conclusion

The estimated existing erosion rate for the Patchett Creek watershed against which potential vineyard erosion can be compared may range from as low as about 557 t/yr to as high as about 2,090 t/yr. The range of natural erosion rates is from about 244 t/yr to 669 t/yr. Sediment yield estimates for existing conditions specific to Patchett Creek developed for this project range from 557 to 828 t/yr. Sediment yield from the proposed project decreases by about ~~10~~ 24 t/yr, (low range estimate) to ~~21~~ 39 t/yr (high range estimate) with erosion and sedimentation mitigation. Patchett Creek sediment yield is predicted to decrease to ~~547~~ 533 t/yr (low range estimate) or to ~~807~~ 789 t/yr (high range estimate) equivalent to a decrease of about ~~2~~4.3% to 4.8% relative to existing conditions for ~~both~~ the low and high range estimates, respectively.

The proposed TMDL load allocation for sediment (RWQCB 2001, Table 6.2, p. 102) is 475 t/mi^2/yr. This is equivalent to 836 t/yr in Patchett Creek (475 t/mi^2/yr x 1.76 mi^2). Based on the erosion rate estimates in Table 3.7-10, the high range (worst case) estimate of ~~807~~ 789 t/yr under project conditions is ~~26~~ 47 t/yr (~~3~~6%) below the proposed sediment load allocation, and the low range estimate of ~~547~~ 533 t/yr is about ~~289~~ 303 t/yr (~~35~~36%) below the proposed sediment load allocation. *The estimated decrease in the Patchett Creek sediment yield of ~~10~~ 24 to ~~21~~ 39 t/yr increases the margin of sediment yield below the TMDL proposed sediment load allocation.*

These data indicate that current erosion rates in Patchett Creek are relatively low compared to other portions of the Gualala River watershed, and that water quality attributes related to erosion and sedimentation processes may not be significantly impaired in Patchett Creek. The relatively large differences between the Patchett Creek sediment yield estimate and TMDL estimates of sediment yield for the same area reflect common difficulties with erosion and sedimentation studies,

including variations in methods, geographic scale and specificity of assessment, and wide naturally-occurring variation in erosion processes and rates. The data indicate that the magnitude of potential erosion from the project is not significant in relation to both existing and natural background rates.

In summary, compliance with the BMPs recommended in the ECP would help ensure that the proposed project would not substantially degrade surface water quality as a result of vineyard development activities. However, without appropriate monitoring of post-project sedimentation rates in the field, a ***potentially significant*** impact could occur if sedimentation increases above the rates estimated in the project analyses.

As a result of the above listed text changes to Impact 3.7-3, Mitigation Measure 3.7-3(b) also requires minor wording changes, as follows:

3.7-3(b) *The following Channel Erosion and Sedimentation Basin Monitoring Plan shall be implemented by the project applicant for the review and approval of the California Department of Forestry and Fire Protection and the Sonoma County Permit and Resource Management Department.*

<u>Monitoring Plan - Class III Channel Response to Potential Peak Flow Increases, Artesa Fairfax THP & Conversion</u>

<u>Motivation</u>

This monitoring plan is motivated by findings of the O'Connor Hydrologic Analysis indicating the potential magnitude (Table 6, p. 29) and potential significance (Table 12, p.52) of expected peak flow increases. Erosion rates in existing stream channels could be accelerated by increased runoff and peak flow expected to result from the project.

There is no compelling evidence that hydrologic change will cause significant erosion in Class III channels draining the project area. Channel response to peak flows is controlled by the size of channels, channel substrate, and the proximity of bedrock and boulder controlled channels downstream. Potential erosion of channels draining the project area is limited to varying degrees by these factors. Furthermore, peak discharge for high-magnitude, low-frequency flows (> 5 yr recurrence interval events) under current conditions indicate that the largest increases in peak flows (2 yr recurrence interval events) predicted under project conditions would be well within the range of flows transmitted by the existing channels in most locations. Hence, the potential for

significant channel erosion related to peak flow change is limited by several factors.

Given the relatively high variability and complexity of hydrologic and geomorphic processes, channel response to identified potential peak flow increases is somewhat uncertain. While the predictable potential effects of the project with mitigation are not significant, unpredictable events or unexpected responses could have substantial impacts. Consequently, a monitoring program is presented below at a conceptual level including substantial detail.

Objective

The objective of the monitoring plan is to observe and document erosion response, if any, of Class III channels draining the project area and verify that the magnitude of response does not rise to a significant level. No net increase in sediment yield from the project area is an environmental objective of the project.

The Erosion Analysis concluded that the project (with mitigation) is expected to reduce sediment yields by ~~10~~ 24 to ~~21~~ 39 t/yr. The specific objective of this monitoring plan is to determine whether potential increases in sediment yield associated with accelerated channel erosion are less than ~~10~~ 24 to ~~21~~ 39 t/yr. In addition, the performance of sedimentation basins will be monitored to provide measurements of vineyard field erosion and sedimentation basin trapping efficiency. These measurements are warranted because they could lead to revisions of predicted vineyard field erosion, which could either increase or decrease the threshold of significance of channel erosion.

Monitoring Plan

The monitoring plan has three components:

1. *Detailed topographic surveys of selected channels;*
2. *Annual survey of erosion of "sensitive" channels; and*
3. *Survey of selected sedimentation basins.*

The annual monitoring survey results shall be submitted to CAL FIRE and the Sonoma County Permit and Resource Management Department.

Topographic Surveys of Selected Class III Channel Reaches

This element of the monitoring plan would include detailed topographic surveys using a total survey station to measure

changes in channel elevation for sample sections of selected Class III stream channels. This study approach has been previously implemented by O'Connor Environmental for Class III streams in Humboldt County to fulfill monitoring requirements of the Pacific Lumber Company Habitat Conservation Plan. The strength of this approach is that it develops accurate, objective quantitative data documenting the dimensions and elevation of channels before the project and three years after project completion. This will provide statistical measures (using parametric techniques), of channel erosion rates that can be extrapolated to assess the magnitude of channel erosion in the project area. The study will be designed so that a range of hydrologic change is observed that will indicate whether peak flow change is correlated with channel erosion rate. Specifically, six channels (2, 20, 31, 40, 45B and 60A; see Hydrologic Analysis, Figure 6 for locations of these channels and Table 6 for the magnitude of expected peak flow change) would be monitored to determine erosion rates over a three year period.

Annual Surveys of Class III Channels

This annual survey would be conducted for the ~~21~~ 18 channels considered to be moderately sensitive to peak flow (Hydrologic Analysis, Table 12). The survey technique to be employed would systematically observe and measure the surface area and depth of fresh channel and bank erosion features as a measure of annual erosion rates. This technique, while objective, requires field estimates that have only moderate levels of precision. The advantage of this approach is that it allows for broad coverage of the monitoring sites and is likely to detect significant changes in the rates of channel and bank erosion. Statistical tests for change would most likely utilize techniques for non-parametric data. These surveys would be conducted four times: once prior to project implementation to document baseline conditions, and then annually in late winter/early spring when annual erosion features are relatively easy to detect and measure. These annual surveys developed over a broad project area are also important in that they would likely detect unexpected rates of change in a time frame that would allow for timely response, if necessary.

Annual Surveys of Selected Sedimentation Basins

This annual survey would measure the volume of accumulated sediment and the grain size distribution of accumulated sediment in a sample of about 25% of the sedimentation basins in the project. By comparison to grain size distribution of the vineyard soils, the deposited sediment size distribution and volume can be

used to estimate the erosion rate of the vineyard fields and the sedimentation basin trapping efficiency (see Reid and Dunne, 1996, Rapid Evaluation of Sediment Budgets, p. 49). The monitoring would be comprised of annual measurements of depth of accumulated sediment in selected basins and collection and laboratory analysis of samples of accumulated sediment. The selection of basins for monitoring would include a range of sediment basin sizes. Data analysis would include comparison of pre-project estimates of vineyard erosion rates and sediment trapping efficiency to measured rates and efficiency.

Adaptive Management

If monitoring data indicate that sediment yields from the project area are greater than predicted in the pre-project analyses, either from unexpected erosion of Class III channels or higher-than expected delivery rates of sediment eroded from vineyard fields, appropriate on- and off-site erosion mitigation will be developed with oversight by the lead CEQA agency or an alternative regulatory authority designated by lead CEQA agency.

On- and off-site erosion mitigation, if deemed necessary and appropriate, may include identification of additional and presently unidentified erosion sites on the project site or on other property in the Patchett Creek watershed. Potential erosion sites could include road-related erosion sites, gullies, eroding stream banks, eroding landslide deposits, or other erosion sites delivering or potentially delivering substantial quantities of sediment to the stream channel network. Off-site projects should be developed in cooperation with any property owner involved, and should include an appropriate level of contribution from each property owner. Disused or informally abandoned logging roads and skid trails are probably the most appropriate type of erosion site to target for off-site mitigation, however, other types of sites should be considered if identified. If suitable or practical sites cannot be located in the Patchett Creek watershed, then sites in the Wheatfield Fork Gualala River watershed should be considered.

Other changes to Chapter 3.7 as a result of public comments

Page 3.7-82 of the DEIR is hereby clarified as follows (see Response to Comment 12-5):

3.7-6 Project-related impacts to groundwater storage and recharge.

The proposed project would result in the removal of approximately 171 acres of timber for vineyard development. All surface runoff from a 36-

> acre watershed would be captured and stored in a proposed 73 acre-foot reservoir for vineyard irrigation. With inclusion of the reservoir and sump areas, the Hydrologic Effects Analysis identified total runoff/precipitation capture area for the proposed project as ~~47~~39 acres.

The modification is for clarification purposes only and does not change the conclusions of the DEIR.

Page 3.7-84 of the DEIR is hereby clarified as follows (see Response to Comment 12-5):

> Effects of Proposed Irrigation System
>
> With implementation of the proposed project, diffuse upland sheet flow and direct precipitation captured from a ~~36~~33.5-acre area would flow into a two acre-foot sump pond, and would then be pumped into the proposed on-site reservoir. The reservoir would be recharged by a combination of captured sheet flow and direct precipitation on an annual basis. The vineyard would be irrigated during the vine establishment phase (probably the first three summers) by means of a drip system supplied by the proposed reservoir. The applicant expects that irrigation demands would be reduced following the grapevine establishment period, due to the fact that excess irrigation of mature vines tends to result in undesirable grape characteristics.
>
> The proposed runoff capture system would not be expected to adversely affect neighboring wells, or general groundwater availability or recharge in the area. This is in part because the project would capture runoff from only ~~47~~39 acres (approximately 4 percent) of the 1,124-acre Patchett Creek watershed. In addition, as shown in Figures 3.7-6, existing wells are located to the west and north of the project area, and groundwater in the project area flows away from these areas.

The modification is for clarification purposes only and does not change the conclusions of the DEIR.

The "Effects of the Proposed Domestic Well" section on pages 3.7-85 and 3.7-86 in Chapter 3.7, *Hydrology and Water Quality,* of the DEIR is hereby revised as follows (see Response to Comment 10-50):

> Effects of the Proposed Domestic Well
>
> Water for washing and other incidental needs of vineyard workers would be provided by a small, low-yield well located at the corporation yard on the north side of Annapolis Road. The applicant would install a 1,000- to 5,000-gallon water tank, although water use would be of a seasonal nature and be unlikely to exceed 20 gallons per day for off-season use during about 11 months out of the year.

Peak use would be at harvest, with water demand projected as follows: For a 30-day harvest season, average picking rate would be 130-acre net vineyard/30 days = 4.3 acres/day. If this were to be completed in a daily morning 4-hour time block, about 1.1 acres per hour would need to be picked. If a worker fills a 40 lb lug in 10 minutes, that is a picking rate of 240 lb/hour (2,000/240 = 8.3 laborers can pick a ton an hour). A high yield of 4 tons per acre for premium grapes would therefore require 8.3 laborers to remove the fruit in a 4-hour period. Assuming a driver and foreman, and reducing the picking rate by 10% to account for breaks and inefficiencies increases the required labor pool to 8.3*1.1 + 2 => +-11-man crew. If the picking rate was doubled, a 22-man crew could cover the property in 15 days.

Grapes are typically harvested before noon to take advantage of cooler weather and the required transportation and handling later at the winery. Assuming 2 gal/worker/day x 22 workers is still only about 44 gal/day for labor needs, assuming no liquids are brought on site. Assuming laborer washup at 2 gpd would add another 44 gal/day for peak season needs.

Equipment washup or dust removal might be practiced on an occasional basis, at perhaps 100 gal/day once or twice a week. For 210 gal/week over 7 days, this would add about 30 gpd to the design load.

The peak season well demand for a 15-day period would therefore be on the order of 44+44+30 = 118 gpd, and much less during most of the year. Sonoma County regulations for residential well yield would not apply, but are never-the-less instructive. Sonoma County regulations require a well yield of 1 gpm. Based on this minimum yield, the design volume would be provided within 2 hours of operation in a 24-hour period. During winter months, with a 5-person crew and a consumptive use of 1 gpd, the rate would decline to 5*(1+2) = 15 gpd for staff and perhaps 30 gpd for other incidental uses.

Annual well demand at 120 gpd for 1 month and 20 - 45 gpd for another 11 months totals less than 20,000 gal/year, equivalent to about 0.057-acre foot (326,264 gal = 1-acre foot) On-site deep percolation in only the +-33.5-acre vineyard sheet flow collection area is estimated at 26-acre feet. Projected well demand and associated potential for overdraft is therefore insignificant in terms of local groundwater supplies and recharge potential.

The proposed well is located hundreds of feet from any existing neighboring wells. For such wells, the County considers performance data confidential. Productivity data would be obtained by the driller during installation and is not likely to represent actual well capacity due to type and condition of pumping and plumbing apparatus, use history of the well, and other unknown geologic factors that may affect capacity over time. There would be no way to independently assess accuracy of anecdotal information provided by adjoining well owners; and

more localized impacts have been demonstrated to be insignificant in terms of groundwater impacts.

A water storage tank is a necessary and prudent component of a well and pump system. The storage tank provides reserve capacity in the event that the power is out for an extended time, and can be set up to minimize the duty cycle of the pump. In some cases, County regulations would require the domestic tap at mid-level and an emergency use tap at the bottom of the tank to guarantee water availability for fire suppression purposes. The fire suppression storage volume would not need to be considered in well yield assessment because it is a one-time fill that remains in passive storage until time of need, which would occur only for highly intermittent fire suppression purposes.

Groundwater wells in the Annapolis area typically utilize the Ohlson Ranch Formation, a sedimentary rock formation found on ridgetops and that overlies the Franciscan Formation. The Ohlson Ranch Formation is relatively thin, ranging from about 20 to 160 thick. Saturated thickness of the aquifer accessible in wells is typically about 100 ft and well depth is typically about 200 ft. Well yields range between 2 and 36 gallons per minute (gpm), and some wells go dry in fall months (DWR, 1975). Well yield in the Ohlson Ranch aquifer is typically less than 10 gpm based on several proprietary well records reviewed for other projects in the Annapolis area. Wells may also penetrate the Franciscan Formation; however, the yield for the best wells in this aquifer is limited to a few gallons per minute in most locations.

Well yields in the range of several gallons per minute can in some circumstances support vineyard irrigation for ~~relatively~~ small acreages. ~~, but are not well suited for extensive irrigation. Assuming that annual vineyard irrigation rates would be 0.5 feet per acre of vineyard, each 1 gpm of well yield could irrigate 1 acre of vineyard if the well is pumped continuously for about 113 days. Hence, a 10 gpm well could be used to irrigate about 10 acres of vineyard, provided the well could support continuous pumping for such a lengthy period and ignoring pumping costs.~~ A well yielding 1 gal/min provides 10,080 gal/week when operated continuously. For a typical vineyard spacing of 7 feet x 4 feet using an industry standard of 5 gal/vine/week, the 1556 vines/ac require 7,780 gal/week. The well operated 24-hours/day would have the theoretical capacity of irrigating about 1.3 acres. By ratio comparison, a 10 gal/min well would have the theoretical capacity of irrigating about 13 acres on an annual cycle. Actual irrigation coverage would be much less, perhaps half the theoretical value, because few wells can perform at full rated capacity under a continuous duty cycle. This approach also requires additional infrastructure in the form of storage tanks and irrigation pumps, because the supply timing and rate does not conform with irrigation distribution timing and rate.

In order to irrigate 130 acres planted vineyard using wells alone, at least 20 wells at 10 gpm and a 50% duty cycle would be required, as would a large tank farm to

store the pumped groundwater. More wells would be required to irrigate directly than to fill the 73 acre-foot reservoir as discussed below, because the irrigation season is shorter than the available reservoir refill season. Neither CAL FIRE nor the project proponents believe vineyard irrigation using groundwater pumping is practical, cost-effective, or politically or environmentally feasible.

Well water could ~~conceivably~~theoretically be used to fill the proposed 73 ac-ft reservoir. An acre-foot is 326,264 gallons. A one (1) gpm well operated continuously produces 43,200 gal/30 days, and would produce one acre foot in 7.55 months. By proportion, a 10 gpm well would produce 10 acre feet in the same time period. To fill the 73 acre-foot reservoir, it would take 15 wells at 10 gpm and a 50% duty cycle operated over about eight months to provide the required volume. ~~As noted above, a 1 gpm well can produce about 0.5 ac-ft of water in a 113 day period of continuous pumping. A well with a yield of 10 gpm could produce 5 ac-ft in the same period; about 15 such wells pumped for about 30% of the year would be required to fill the 73 ac-ft reservoir.~~ While sufficient groundwater could be available in the aquifer to support this level of withdrawal, the expense of developing and pumping this number of wells would be considerable. CAL FIRE and the roject proponents do not believe this water development approach is practical, cost-effective, or politically or environmentally feasible. Rather, a passive, low impact surface sheet flow runoff collection system has been designed for collection and storage of the required 73 acre feet of irrigation water.

~~To provide sufficient water for vineyard irrigation, several wells of above-average capacity would be required. The cost of development of such a network of wells would be considerable, and would be in addition to the cost of development of the surface runoff collection system and storage reservoir that is intended to supply water for irrigation. If more abundant groundwater were available in the area, irrigation supplies from wells might have been considered; the expense of developing the surface collection facilities should be a sufficient indication of the intent of the project proponent to utilize surface runoff water rather than groundwater for vineyard irrigation.~~

The revisions provide expansion and clarification and do not change the conclusions of the DEIR.

3.8 Hazards

Mancozeb is a carbamate fungicide that is used by an ever decreasing number of vineyards in Sonoma County, but now falls low on the list of chemicals. At the time of the writing of this Final EIR (May 2011), Artesa no longer uses this chemical. Therefore, it is necessary to clarify the current information contained in Table 3.8-2 of the DEIR, which lists dithane (mancozeb) as a potential agricultural chemical to be applied on-site. While dithane (mancozeb) was used much more frequently in the past in the industry, there are now many more fungicides that are at least as effective as dithane (mancozeb), but, importantly, pose a lower risk to receptors. The list of

chemicals included in Table 3.8-2 of the DEIR is based upon the vineyard manager's then-current review of the previous few years of limited chemical usage at all of Artesa's vineyards. Given the fact that the DEIR was released in June 2009, the chemical inventory review performed by the vineyard manager during preparation of the DEIR now reflects the chemicals used by Artesa 3-5 years ago. The agricultural chemistry has improved considerably over the last 3-5 years. While Artesa has used dithane (mancozeb) in the past in rare circumstances, this chemical is no longer being used, as there are now many options, which are better than dithane (mancozeb) from an environmental perspective. As a result, Table 3.8-2 of the DEIR, *Agricultural Chemicals to Potentially be Applied Onsite*, is hereby revised below to remove dithane (mancozeb) from the list of potential chemicals. Furthermore, Table 3.8-2 is revised below to remove the fungicide Abound as Artesa no longer uses this chemical due to concerns that target organisms have developed a resistance; and while Nexter is still in use in the greater industry, it is hereby removed from Table 3.8-2 due to new, lower impact alternatives being used by Artesa as of late. Similarly, Pristine and Applaud have been added to Table 3.8-2 given that these chemicals are lower impact alternatives (compared to those hereby deleted from the table) that more accurately represent what is being used today by both Artesa and the greater industry.

Intrepid is also hereby added to Table 3.8-2 out of an abundance of caution to address the limited potential for crop damage by the light brown apple moth and European grapevine moth, both of which are new pests since the initial preparation of Table 3.8-2 of the DEIR.

Lastly, as a result of public comment and further consideration by the vineyard manager and project applicant, the decision has been made not to utilize POEA surfactants; rather, only surfactants approved for use near water, such as Latron. Therefore, CMR Silicone Surfactant is hereby deleted from Table 3.8-2 below (see Response to Comment 7-9).

Table 3.8-2
Agricultural Chemicals to Potentially be Applied Onsite

(If after implementation of cultural practices the use of chemical control is deemed necessary, it is anticipated that only a few of the below reduced risk pesticides would be necessary, as discussed in the above text)

Chemical Name *(Active Ingredient)*	**Target Pest**	**Mode of Action**	**Hazardous Breakdown Products**	**Delivery System**	**Restrictions on Use**	**Toxicity***
Adjuvants/Surfactants						
~~CMR Silicone Surfactant~~ ~~*Organo-Modified Siloxane*~~	~~N/A~~	~~Surfactant/Spreader not pesticide~~	~~Combustion: CO/CO_2~~	~~Applied in the same manner as pesticide with which the substance is mixed.~~	~~Do not apply directly to surface waters.~~	~~When mixed with pesticide, the Restricted Entry Interval for the pesticide should be followed.~~
Latron ™ *Phthalic/glycerol alkyl resin*	N/A	Spreader/Sticker not pesticide	None Known	Applied in the same manner as pesticide with which the substance is mixed.	None identified.	N/A
Tripline Foam-Away	N/A	Anti-Foam, not pesticide	Combustion: CO, CO_2	Applied in the same manner as pesticide with which the substance is mixed.	None identified.	N/A
Fungicides						
~~Abound ™~~ ~~*Azoxystrobin*~~	~~Broad spectrum fungicide with activity against several diseases including downy mildew and powdery mildew.~~	~~Single-Site~~	~~Combustion: CO/CO_2~~	~~Applied by hand-operated or tractor mounted sprayer.~~	~~Not to be applied directly to water, areas where surface water is present, or intertidal areas below the mean high water mark. Do not allow to get into surface water, drains, and ground water.~~	~~Restricted Entry Interval of 4 hours following spraying. Toxic to freshwater and estuarine/marine fish.~~
CSC Dusting Sulfur, ™ Kumulus ,™ Special Electric ™ *Sulfur*	Powdery mildew.	Multi-site Contact	Combustion: SO_2, H_2S, CS_s	Applied by tractor mounted blower/sprayer.	None identified.	Low toxicity.
~~Dithane~~ ~~*Mancozeb*~~	~~Broad spectrum fungicide.~~	~~Multi-site Contact~~	~~Combustion: CS_2, H_sS~~	~~Applied by tractor mounted blower/sprayer.~~	~~Not to be applied directly to water, areas where surface water is present, or intertidal areas below the mean high water mark. Do not allow to get into surface water, drains, and ground water.~~	~~Restricted Entry Interval of 24 hours following spraying. Very highly toxic to aquatic organisms.~~
Kaligreen *Potassium hydrogencarbonate*	Powdery mildew.	Potassium ion balance disruption	CO_2, Potassium	Applied by tractor mounted blower/sprayer.	None identified.	Restricted Entry Interval of 4 hours following spraying.
Quintec ™ *Quinoxyfen*	Protectant fungicide for control of powdery mildew diseases.	Multi-site	None under normal conditions of storage and use	Applied by tractor mounted blower/sprayer.	Prevent from entering into soil, ditches, sewers, waterways, and/or groundwater.	Restricted Entry Interval of 12 hours following spray
Serenade™ dried *Bacillus subtilis*	Fungal inhibitor, protects against powdery mildew, botrytis, and sour rot.	Multi-site	None Known	Applied by tractor mounted blower/sprayer.	None identified.	Restricted Entry Interval of 4 hours following spraying. Non-toxic to species tested on, not expected to impose any environmental rist.
Sovran ™ *Kresoxim-methyl*	Powdery mildew and botrytis.	Mitochondrial electron transport inhibitor	Oxides of Carbon and Nitrogen	Applied by tractor mounted blower/sprayer.	Not to be applied directly to water, areas where surface water is present, or intertidal areas below the mean high water mark. Do not allow to get into surface water, drains, and ground water.	Restricted Entry Interval of 12 hours following spraying. Toxic to freshwater and estuarine/marine fish, and marine invertebrates.

Table 3.8-2
Agricultural Chemicals to Potentially be Applied Onsite

(If after implementation of cultural practices the use of chemical control is deemed necessary, it is anticipated that only a few of the below reduced risk pesticides would be necessary, as discussed in the above text)

Chemical Name ***(Active Ingredient)***	**Target Pest**	**Mode of Action**	**Hazardous Breakdown Products**	**Delivery System**	**Restrictions on Use**	**Toxicity***
Stylet Oil *Hydrotreated parafinnic distillate*	Powdery mildew, also works as an insecticide targeting mites, whitefly, and leafminers.	Smothering and Barrier	Combustion: CO, CO_2, SO_2, NO	Applied by tractor mounted blower/sprayer.	Not to be applied directly to water, areas where surface water is present, or intertidal areas below the mean high water mark. Do not allow to get into surface water, drains, and ground water.	Restricted Entry Interval of 4 hours following spraying. Toxic to fish.
Vangard™ *4-Cyclopropyl-6-methyl-2-phenylamino-pyrimidine*	Broad spectrum fungicide used to control powdery mildew and botrytis.	Single-Site	None Known	Applied by tractor mounted blower/sprayer.	Not to be applied directly to water, areas where surface water is present, or intertidal areas below the mean high water mark. Do not allow to get into surface water, drains, and ground water.	Restricted Entry Interval of 48 hours following spraying. Toxic to fish and aquatic invertebrates.
Pristine *Pyraclostobin Boscalid*	Fungicide	Respiration Inhibitors-target Site of Action Group 11 and Group 7	None known	Tractor-mounted sprayer	None	Restricted re-entry 12 hours unless cane-tying, then 5 days
Herbicides						
Roundup™ *Potassium salt of Glyphosate*	Broad spectrum herbicide for control of weeds and grasses within grape rows.	Inhibit plant protein synthesis	Hydrogen gas (H_2) Combustion: CO, P_xO_y, NO_x	Applied by hand sprayer.	Keep out of drains, sewers, ditches, and water ways.	Restricted Entry Interval of 4 hours following spraying. Moderately toxic to fish.
Insecticides						
Admire™, Provado™ *Imidacloprid*	For use against sucking insects including leafhoppers, aphids, and white fly.	Acetylcholine agonist (mimic)	HCL, HCN, CO, NOx	Applied by tractor mounted blower/sprayer.	Not to be applied directly to water, areas where surface water is present, or intertidal areas below the mean high water mark. Do not apply the product if drift to blooming crops or weeds if bees are visiting treatment areas. Do not allow to get into surface water, drains, and ground water.	Restricted Entry Interval of 12 hours following spraying. Highly toxic to bees and aquatic invertebrates.
Agri-Mek™ *Abamectin*	Spider mites.	Chloride channel activator	None Known	Applied by tractor mounted blower/sprayer.	Not to be applied directly to water, areas where surface water is present, or intertidal areas below the mean high water mark. Do not apply the product if drift to blooming crops or weeds if bees are visiting treatment areas. Do not allow to get into surface water, drains, and ground water.	Restricted Entry Interval of 12 hours following spraying. Highly toxic to bees, fish, and aquatic invertebrates.
~~Nexter™ *Pyridazinone*~~	~~Aphids, mites, leafhoppers, and whitefly.~~	~~Insect mitochondrial electron transport inhibitor~~	~~HCl, Oxides of Nitrogen, SO_x, CO~~	~~Applied by tractor mounted blower/sprayer.~~	~~Not to be applied directly to water, areas where surface water is present, or intertidal areas below the mean high water mark. Do not apply the product if drift to blooming crops or weeds if bees are visiting treatment areas.~~	~~Restricted Entry Interval of 12 hours following spraying. Toxic to fish, aquatic invertebrates, and bees.~~

Table 3.8-2
Agricultural Chemicals to Potentially be Applied Onsite

(If after implementation of cultural practices the use of chemical control is deemed necessary, it is anticipated that only a few of the below reduced risk pesticides would be necessary, as discussed in the above text)

Chemical Name *(Active Ingredient)*	Target Pest	Mode of Action	Hazardous Breakdown Products	Delivery System	Restrictions on Use	Toxicity*
Applaud *Buprofezin*	Mealybugs, leafhoppers	Insect growth regulator	CO, CO_2, nitrous oxides, sulphur dioxide	Tractor-mounted sprayer	Not to be applied by air; no more than 2 times per year; not later than 80% capfall	Restricted re-entry until product dries
Intrepid *Methoxyfenozide*	Lepidopteran	Insect growth regulator	None known	Tractor-mounted sprayer	Not to be applied more than 16 ounces per application, or 48 oz. per season	Not to be applied less than 30 days preharvest

Source: Don Clark, Vineyard Manager for Artesa; Material Data Safety Sheets and Product labels for individual, name brand chemicals.
*The Restricted Entry Interval listed is from the labels of the individual products and is considered somewhat indicative of the chemical toxicity; however, in the State of California the Restricted Entry Interval for all pesticides is a minimum of 24 hours which is greater than or equal to the required time interval of all of the above listed pesticides except for Vangard.

~~**Abound**~~
~~http://www.syngentacropprotection-us.com/prodrender/index.asp?nav=labels&ProdID=51~~
Provado
http://www.cdms.net/LabelsMsds/LMDefault.aspx?pd=6486
~~**CMR Silicone Surfactant**~~
~~http://www.montereychemical.com/label/CMRSilSurfactant.pdf~~
~~**Diathane**~~
~~http://www.cdms.net/LabelsMsds/LMDefault.aspx?manuf=11&t=~~
Kaligreen
http://www.cdms.net/LabelsMsds/LMDefault.aspx?manuf=129&t=
Latron
http://www.cdms.net/LabelsMsds/LMDefault.aspx?manuf=7&t=
~~**Nexter**~~
~~http://www.cdms.net/LabelsMsds/LMDefault.aspx?pd=8447~~
Quintec
http://www.cdms.net/LabelsMsds/LMDefault.aspx?pd=6582&t=
Roundup
http://www.monsanto.com/monsanto/ag_products/crop_protection/labels_msds.asp
Serenade
http://www.agraquest.com/products-solutions/labels-msds.html
Sovran
http://www.cdms.net/LabelsMsds/LMDefault.aspx?pd=3813&t=
Stylet Oil
http://www.cdms.net/LDat/ld5QF002.pdf
Vangard
http://www.syngentacropprotection-us.com/prodrender/index.asp?nav=LABELS&ProdID=661&ProdNM=Vangard%20WG
It should be noted that the above list of pesticides/herbicides/fungicides were provided by the applicant based on their past use and anticipated future use. As new chemicals are approved the above listed chemical may be replaced.

The above modifications are for clarification purposes only and do not change the conclusions of the DEIR.

The sensitive receptor discussion of the Pesticide Management Plan on page 3.8-23 of the Hazards chapter is hereby clarified as follows:

(C) Domestic Wells

As shown in Figure 3.7-6 of the *Hydrology and Water Quality* chapter of this DEIR, numerous domestic wells are located in the project vicinity. The wells are located primarily upslope of the project site to the north and west. As stated in Chapter 3-7:

> The groundwater gradient most likely parallels the slope of the geologic contact, which is in turn generally parallel to the surface topography. Almost all of the project area is underlain by this sloping shallow aquifer. Groundwater flows are generally from west- northwest to east-southeast, toward Patchett Creek. The geometry of the aquifer and the location of the contact between the Franciscan and the Ohlson Ranch Formations to the west are uncertain. Even if the geologic contact west of the project site dips to the west, the geometry of the rock formations under the project site is relatively well-defined, and groundwater from the project site would still be expected to flow to the east-southeast.

Therefore, both overland flow and groundwater flow from the project site would not interact with existing domestic wells, and as a result, pesticide use is not anticipated to adversely affect ~~either groundwater or surface flow~~ nearby domestic wells. Potential impacts to special status species via pesticide interactions are discussed below, and in Chapter 3.4, Biological Resources.

The above modifications are for clarification purposes only and do not change the conclusions of the DEIR.

4.0 CUMULATIVE IMPACTS

The Fairfax Conversion DEIR included a detailed discussion of the project's cumulative contribution to global climate change on pages 4-13 to 4-17 of the Cumulative Impacts Chapter. This analysis was based on the best available data in publication at the time the DEIR was released for public review in June 2009. Since the release of the DEIR for review and comment, additional material has been published regarding the pertinent topics of global climate change and carbon sequestration. In addition, CAL FIRE has prepared a Greenhouse Emissions Calculator and associated user guide. Based on the additional materials published since the release of the Fairfax Conversion DEIR, including the lead agency's Greenhouse Emissions Calculator, Raney has worked with the RFP for the Fairfax Conversion project to update the

Global Climate Change Impact Statement, Impact 4-3, in the DEIR. This updated climate change/GHG impact analysis for the Fairfax Conversion project has already been issued as Chapter 4, Cumulative Impacts, of the Partially Recirculated DEIR. The updated climate change/GHG impact analysis has been included below in full as it directly addresses the majority of the comments provided in the commenter's letter.

Impact 4-3 on pages 4-13 to 4-17 of the DEIR is revised as follows (see Response to Comment 6-8):

4-3 Cumulative contribution to Global Climate Change.

The proposed project would convert forests and grasslands to vineyards, a reservoir, corporation yard, and roads. According to the United States Environmental Protection Agency (USEPA, www.epa.gov) carbon sequestration rates vary by tree species, regional climate, topography, and management practices. In addition, soil carbon sequestration rates vary by soil type and cropping practice. In order to estimate the GHG effects of the project, CAL FIRE must analyze the difference between business as usual activities under current use for timber management and the effects of conversion of part of the site from forest to vineyard establishment plus change in management on rest of site from timber harvest to reserve.

~~The USEPA information states that reforestation of previously harvested lands results in sequestration of approximately 1.1 to 7.7 metric tons of carbon per acre annually.[i] Studies conducted at the Jackson State Forest in Mendocino County[ii] indicate that assuming the annual sequestration of approximately 2.0 metric tons of carbon per acre would be a reasonable expectation for the mixed coniferous forest located on the project site. Onsite vegetation is largely composed of second-growth forest; therefore, the reforestation sequestration rates currently apply. The USEPA information for grasslands indicates that carbon is sequestered at a rate of 0 to 1.9 tons per acre annually. Following conversion of the project site, cover cropping and "no till" agricultural practices would be implemented in the vineyard area. Conservation tillage has been shown to sequester approximately 0 to 1.1 metric tons of carbon per acre per year on croplands. As the project site would be practicing conservation "no till" agricultural practices, including cover crops, the vineyard areas should sequester carbon within or above the conservation tillage range. Furthermore, vines are woody vegetation that would also sequester carbon. As a result, both the forested areas and the vineyard areas of the project site would continue to absorb carbon from the atmosphere.~~

~~Carbon accumulation in forests and soils eventually reaches a saturation point, beyond which additional sequestration is no longer possible. This happens, for example, when trees reach maturity, or when the organic matter in soils builds up to saturation levels. Even after saturation, the trees or agricultural practices would need to be sustained to maintain the accumulated carbon and prevent subsequent losses of carbon back to the atmosphere.~~

Timber Harvest Operations

Out of a total of 324 acres, the proposed project includes the logging of an approximately 154~~171~~-acre timberland conversion area and develop~~ing~~ment of approximately 19 acres of grassland. The RPF for the project has performed detailed computations to estimate the total amount of greenhouse emissions that would result from all facets of the proposed on-site timber harvest operations. These computations were made by the RPF using CAL FIRE's recently released Greenhouse Emissions Calculator. The following section describes the methodology inherent in CAL FIRE's Greenhouse Gas Emissions Calculator (GHG Calculator) and the project-specific data entered into the Calculator by the RPF.

Greenhouse Gas Emissions Calculator Methodology

Standing Live Carbon

In order to determine the impact of the project on net sequestration of standing conifer and hardwood timber, an analysis of potential carbon sequestration under two scenarios was conducted. The first scenario involves carbon sequestration following a reasonable prediction of sustainable forest management on the project area ("No Project – Timber Resource Management Alternative"). The second analysis involves net carbon sequestration following implementation of the proposed conversion and creation of the reserve area.

The analysis was developed utilizing the CAL FIRE GHG Calculator which can be found at:

http://www.fire.ca.gov/resource_mgt/downloads/THP_GreenhouseGasEmissions_Calculator_061110.xls

Utilizing the CAL FIRE GHG Calculator, three sets of data were developed for the project area: 1) the conversion area, 2) the reserve area, and 3) No Project – Timber Resource Management Alternative (See Appendix R). The CAL FIRE GHG Calculator takes into account estimates of species percentage, current inventory, growth rates of hardwood and conifer timber, harvest volumes, emissions associated with harvest operations (chainsaws, tractors, loaders, log trucks etc.), emissions associated with milling of forest products, emissions required for site preparation (including removal of brush and stumps), and the amount of long-term sequestration stored in the wood products produced. The CAL FIRE GHG Calculator accounts for both above and below ground carbon in timber. The estimates provided in the CAL FIRE GHG Calculator of species percentage, current inventory and growth are based on professional judgment as no timber cruise has been conducted.

The analysis shows that for the 154 acres to be converted from timberland to vineyard, there will be a net loss of 24,223 Mg of CO_2e over the 100 year analysis period.[4] The 151 acres of forestland in the reserve area will sequester 95,796 Mg of CO_2e over the 100 year analysis period. It is unclear exactly when the amount of carbon stored in this reserve area would offset the CO_2e lost from the converted area, but it most likely occurs somewhere between years 40 to 50.

The "No Project – Timber Resource Management" analysis shows the amount of carbon sequestered in the 305 acres of forestland area (on the entire 324 acre property) if the conversion were not to occur and a periodic harvest be conducted as was the case in the past (i.e. business as usual). The calculations show that a sustainable harvest conducted every twenty years sequesters 52,388 Mg of CO_2e over the 100 year analysis period. Therefore, converting 154 acres of timberland while setting aside 151 acres of timberland in a reserve area, as is currently proposed, would result in an additional 19,185 Mg of CO_2e being sequestered over what would be sequestered if the current practice of a periodic harvest were to occur. Table 4-3 below shows these results in terms of Mg CO_2e and Mg C.

Table 4-3
Net Sequestration of No-Project, and Project Standing Live Carbon (> 8" DBH)

	Total Sequestration over 100 years Mg CO2e	Total Sequestration over 100 years Mg C	Annual per acre Sequestration over 100 years Mg C per Acre
151 acre Reserve Sequestration	95,796	26,126	1.730
154 acre Conversion Area Sequestration	-24,223	(6,606)	-0.429
Net Project Sequestration	71,573	19,520	
No Project – Timber Resource Management Sequestration (305 acres)	52,388	14,288	0.468
Net Difference	19,185	5,232	

Other Carbon Pools

The CAL FIRE GHG Calculator addresses sequestration for standing live carbon in trees 8" DBH and larger. The analysis of sequestration and emissions must also address soil carbon, litter and duff, lying dead wood, standing dead wood, understory (brush or grass species), and non-merchantable standing live carbon (trees less than 8 inches DBH). With the exception of soil carbon, the other carbon pools are assumed to be on average static in the No Project – Timber Resource Management Alternative, thus there is no net sequestration or emission over time.

[4] Metrics are as follows: Mg = one megagram or one metric ton, which is equivalent to about 2,204.6 pounds or 1.1 short tons. CO_2e is the equivalent weight of CO_2 per metric ton of carbon (C) expressed in metric tons. One metric ton of C is equivalent to approximately 3.67 metric tons of CO_2.

In order to determine the complete carbon sequestration picture, these other pools must be estimated. Based on the assumptions utilized with the CAL FIRE GHG Calculator, it is possible to determine the beginning live carbon stocks for the project area. The CAL FIRE GHG Calculator indicates that there is approximately 200 Mg of CO_2e (54.5 Mg C) per acre in the current standing stock of above and below ground conifer and hardwood timber. In order to estimate the relative percentage of carbon in each carbon pool, data from the FIA database for the 2009 California inventory was consulted[5]. The relative proportion of carbon for each carbon pool for private ownerships in the redwood forest type is shown in Table 4-4 below. This table shows that soil carbon, litter and understory carbon pools represent approximately 15%, 16% and 0.7% of all carbon pools, respectively.

Table 4-4
Carbon Pools for the Redwood Forest Type on Private Ownerships (FIA 2009)

	Soil	Litter	Standing Dead	Lying Dead	Understory[6]	Live Trees[7]	Total
Mg C per acre	22.04	23.97	6.42	10.27	1.05	82.91	146.66
% of Total Carbon	15%	16%	4%	7%	1%	57%	100%

Using the Redwood Forest Type percent carbon estimates from Table 4-4 with the CAL FIRE GHG Calculator estimate of 54.5 Mg/ac for above and below ground live carbon for live trees ≥8" DBH, Table 4-5 has been constructed to estimate the carbon content of all pools for the project area.

The project carbon stocks are less than those for the average of the redwood forest type derived (Table 4-4), but the assumption is made that the relative proportion of the carbon from the FIA data would be similar to that of the project area. However, since the project area is considerably less stocked and younger on average than the average stand estimated by the FIA data, we have assumed that the standing dead and lying dead pools are 30 to 40 percent of those predicted by FIA, or 2 Mg C per acre (i.e., 0.3 * 6.42) and 4 Mg C per acre (0.4 * 10.27) respectively. The percentages of total carbon for the other pools were then adjusted slightly to account for these changes. Finally, a review of the FIA data indicates that approximately 6% of the total live tree carbon in the redwood forest type is found in trees < 8 inches DBH. Using the live tree carbon pool estimate from the CAL FIRE GHG Calculator of 54.5 Mg C per acre for trees >8" DBH, the total project live tree carbon pool is estimated at 57.98 Mg C per acre [54.5 ÷ 0.94(>8" DBH live tree carbon percentage)]. Live tree carbon <8" DBH is then estimated at 3.48 Mg C per acre (57.98 × 0.06). Based on these assumptions, the estimate of all carbon pools on the project area is shown in Table 4-5 below.

[5] http://fiatools.fs.fed.us/fido/index.html
[6] Above and below ground.
[7] Above and below ground 1" DBH and larger.

Table 4-5
Project Area Carbon Pool Estimates

	Soil	Litter	Standing Dead	Lying Dead	Understory	Live Trees <8" DBH	Live Trees >8" DBH	Total
Mg C per acre	15.41	16.76	2.00	4.00	0.69	3.48	54.50	96.84
% of Total Carbon	16%	17%	2%	4%	1%	4%	56%	100%

Note: The percentage of total carbon for each carbon pool shown in Table 4-5 differs slightly than the percentages for the average FIA data shown in Table 4-4 due to the lower estimate of standing and lying dead carbon on the project area as compared to the average FIA data.

Carbon Losses

The CAL FIRE GHG Calculator estimates losses from the live tree carbon pool >8" DBH, as well as approximately 2 Mg C of carbon losses from understory vegetation (understory and live tree <8" DBH pools from Table 4-5 above) removed as a part of site preparation. The CAL FIRE GHG Calculator thus already accounts for approximately 48% of the potential losses from the understory and live tree <8" carbon pools. The impacts on the other carbon pools due to conversion from forest to vineyard must now be estimated.

Soil Carbon Losses

The impacts of vegetation manipulation on soil carbon are complex, and are the least well understood component of the carbon cycle. The following discussion provides a conservative estimate of soil carbon impacts based upon the information obtained during the literature search.

Murty et. al.[8], 2002 indicates that soil carbon losses from forest conversion to cultivated land are around 20%. Soil carbon losses are rapid initially, but reach a new equilibrium within 5-10 years. Soil carbon in the soil occurs in two forms; mineral soil carbon, and forest floor soil carbon. Forest floor soil carbon storage is more susceptible to losses from the removal of vegetation, than is soil mineral carbon. Because deep ripping is not proposed as part of this project, impacts to mineral carbon would be minimal.[9] These losses in soil carbon can be mitigated

[8] Murty, D. et. al., "Does conversion of forest to agricultural land change soil carbon and nitrogen? A review of the literature," *Global Change Biol.*, 8: 105-123, 2002.

[9] Deep ripping is practiced by using a ripper shank that penetrates 4-5 feet pulled by a D8 or larger tracklayer. This soil disturbing practice is not planned for the Fairfax Conversion project. It is important to note that deep ripping is not necessary for stump removal. Most stumps are small, and a typical, efficient method of removal is as follows:

- Cut the stem off 2-4 feet above the ground.
- Pull the stump and main roots using an excavator with thumb and gently shaking sideways while lifting.
- Minimum soil disturbance and maximum root removal occurs using this method.
- Larger stumps may require some digging around the base to free up the larger roots.

Shallow ripping is practiced using a smaller tractor and smaller set of ripper shanks that penetrate 18-24 inches into the ground. The tillage operation does not change the soil profile or bring material to the surface. It is used to break up any shallow hard pan to promote root penetration into the soil. In addition, rock removal will be negligible for the

through the application of conversion methods and vineyard practices as described in the summary below. For this analysis, it is estimated that 25% of the soil carbon will be lost following conversion, which amounts to a slightly higher estimate of carbon loss than would be indicated by Murty et. al.

Losses from Other Pools

It is estimated that 100% of the carbon stored in litter will be removed on the portion of the site that is converted. The practice of placing cull logs and existing lying dead wood from the conversion area within the forest reserve during the conversion process is expected to decrease the potential for carbon losses from the standing dead and lying dead pools to 30%. The understory and small live carbon pools are estimated to be completely removed with the conversion. Because the CAL FIRE GHG Calculator already accounts for 48% of the potential losses from the understory and live tree < 8" DBH pools, these pools are only reduced by 52% in Table 4-6. Table 4-6 shows the estimated reduction in carbon for all of the pools based on the above assumptions.

Table 4-6
Projected Reduction in Project Area Carbon Pools from Conversion in addition to GHG Carbon Calculator

	Soil	Litter	Standing Dead	Lying Dead	Understory	Live Trees ≤8" DBH	Total
% of Carbon Lost	25	100	30	30	52	52	
Mg C per acre Lost	3.85	16.76	0.60	1.20	0.36	1.81	24.58

Note: values calculated based on those contained in Table 4-5. For example, Soil carbon pool reduction = 15.41 Mg C per acre soil carbon x 0.25 (percent) loss = 3.85 Mg C per acre soil carbon lost.

The loss of 24.58 Mg C per acre on the conversion area equates to an annual loss of 0.246 Mg C per acre per year over the 100-year analysis period (24.58 Mg C per acre/100 years; see Table 4-7).

Fairfax Conversion project because the local Goldridge-variant sandy loam soils typically do not include rock in the profile.

Most roots in the soil profile will be in the approximate upper foot of soil. A typical method of root removal is to use a brush rake mounted on a dozer blade to selectively bring roots to the surface. The brush rake penetration depth is generally 12 inches or less, depending on the size of the dozer. A combination of mechanical raking and hand picking will result in removal of most of the objectionable residual root mass.

Normal industry-standard agricultural practices include discing a field in preparation for planting, to create a seed bed free of competing weeds. A typical disc penetrates the first 6-8 inches of topsoil during that operation.

The one-time site preparation activity of shallow ripping modifies soil structure to 18-24 inches, only about 12-18 inches deeper than the final field preparation activity of discing. Once the vineyard is set up, there should be no further tillage or soil disturbing activity.

In addition to losses of soil carbon due to the conversion of forest to vineyard, the sequestration of carbon from forest soils in the 305 acres of forest in the business-as-usual scenario, and the 151-acre post conversion reserve area must be included. Based on the range of soil sequestration values presented in Heath et. al.[10] for various forest management activities, the current soil sequestration rate is set at 0.197 Mg C per acre per year which is the medium rate of soil sequestration for a harvest scenario which lengthens rotations (see Table 4-7). The reserve area is given a sequestration rate based on the high rate of sequestration due to lengthening rotations or 0.484 Mg C per acre per year (see Table 4-7).[11]

Vineyard Sequestration

Approximately ~~171~~116 acres of the 154-acre timberland conversion area would ~~then~~ be developed as a vineyard, including the cover cropped paths between the vines. ~~Implementation of the proposed project would likely reduce the carbon absorption of the project site (See Table 4-3).~~

In a study that modeled California's 15 largest agricultural counties and divided each county into three crop types (i.e., orchards vineyards, and annual crops), it is noted that in the past half century the amount of carbon released into the atmosphere through agricultural practices has decreased due to changing agricultural practices.[12] For example, improved crop varieties and industrial fertilizer have increased crop biomass and the amount of carbon returning to soils, thus increasing soil carbon stocks. Kroodsma and Field found that carbon sequestration varied significantly between crop types and perennial crops sequestered more carbon than annual crops, with vineyards sequestering 24 g $C/m^{-2}/yr^{-1}$.[13] Kroodsma and Field also note that soil carbon sequestration varied significantly between counties and soil carbon sequestration was highest in counties with a high percentage of rice and/or perennial crops, and lowest in counties with few perennial crops and a high percentage of silage crops.[14]

Using the woody material and soil carbon sequestration rates for California vineyards in Kroodsma and Field, the post-conversion annual sequestration rate for the proposed 116-acre vineyard on the Fairfax Conversion project site was estimated in Table 4-7 below. The 116-acre vineyard area has the potential to sequester carbon in woody material from the vines, as well as soil carbon.

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[10] Annual carbon sequestration rates for forest soils were obtained from The Potential of U.S. Forest Soils to Sequester Carbon and Mitigate the Greenhouse Effect, Chapter 23, The Potential of U.S. Forest Soils to Sequester Carbon, by Linda S. Heath, John M. Kimble, Richard A. Birdsey, and Rattan Lal, 2003.

[11] Table 23.3 in Heath et al. presents sequestration rates in kilograms per hectare per year (kg/ha/yr). To convert to Mg C per acre per year, the sequestration values from Table 23.2 are divided by 2.47 acres per hectare, and then divided by 1,000 kg per Mg.

[12] David A. Kroodsma and Christopher B. Field, "Carbon Sequestration in California Agriculture, 1980-2000," in *Ecological Applications*, 16(5), 2006, pp. 1975-1985.

[13] Kroodsma and Field, 1980. Note this assumes 4 g $C/m^{-2}/yr^{-1}$ in woody material and 20 g $C/m^{-2}/yr^{-1}$ in soils.

[14] Kroodsma and Field, 1980.

It should be noted that an important factor when considering soil carbon dynamics is soil respiration. According to a recent UC Davis study entitled "Effects of Land Use on Soil Respiration: Conversion of Oak Woodlands to Vineyards," it is noted that soil CO_2 efflux, or "soil respiration," is one of the more important components of ecosystem C budgets.[15] Soil respiration consists of organic matter oxidation, root respiration, and rhizosphere respiration (i.e., microbial consumption of root exudates and contents of sloughed cells) (Hanson et al., 2001).

Grasslands

Nineteen (19) acres of grasslands are located in both the current land use and the proposed project. Thus, the project has no effect on current carbon and GHG emissions and sequestration for the grassland area.

Summary of above Pre- and Post-Project Sequestration Analysis

Table 4-7 shows the average annual sequestration for the current use, and the project over a 100-year analysis period. Losses of carbon resulting from removal of standing live biomass and cultivation of soil are shown as annualized emissions. The net result of this comparison shows that the project does not result in a net loss of carbon sequestration over the 100-year analysis period.

[15] Eli A. Carlisle, Kerri L. Steenwerth, and David R. Smart, "Effects of Land Use on Soil Respiration: Conversion of Oak Woodlands to Vineyards," *Journal of Environmental Quality*, 35:1396–1404 (2006), 1396. The study consisted of three oak woodland and three vineyard sites with known land use histories in the Oakville Region of Napa Valley, California. The vineyard sites were formerly part of the adjacent oak woodlands before their conversion to vineyards. The vineyards were converted directly from oak woodlands 30 to 32 years ago. As noted in the Conclusion section of the study, the investigation has shown that the study oak woodland sites lose significantly more soil CO_2 than adjacent vineyards. Cultural practices such as tillage and vineyard preparation had large impacts on soil organic carbon (SOC) pools and SOC distribution through the soil profile. Soil [CO_2] and CO_2 values from this investigation have shown that the respiration sources in the soil profile change with season and depth, and that soil moisture content has a large influence on soil respiration values. The authors' estimates point to the clear need to develop a more acute understanding of the contribution of belowground production in perennial cropping systems, as well as in the perennial systems from which they were converted. While the results of the study by Carlisle et al are not directly applicable to the Fairfax Conversion project site given the site's lack of oak woodland forest type, it raises the important question which has heretofore been little studied – that is, whether or not soil respiration would be greater in mixed evergreen second growth forests, such as the Fairfax Conversion project site, as compared to an established vineyard.

~~Table 4-3~~ ~~Onsite Carbon Sequestration Estimates~~					
~~Current Use~~	~~Acreage (ac.)~~	~~Carbon Sequestration Rates (metric tons per acre per year)~~	~~Low Estimate (metric tons of carbon)~~	~~California Estimate (metric tons of carbon)~~	~~High Estimate (metric tons of carbon)~~
~~Pre-Conversion~~					
~~Forest (Reforestation rates)~~	~~305~~	~~1.1 to 7.7 (2.0 for California Estimate)~~	~~335.5~~	~~610~~	~~2,348.5~~
~~Grassland~~	~~19~~	~~0* to 1.9 (0.02 for California Estimate)~~	~~0~~	~~0.4~~	~~36.1~~
~~**Pre-Conversion Totals**~~	~~**324**~~		~~**335.5**~~	~~**610.4**~~	~~**2,384.6**~~
~~Post Conversion~~					
~~Vineyard (Conservation tillage)~~	~~159~~	~~0* to 1.1 (Mid-range of 0.55 assumed for California Estimate)~~	~~0~~	~~87.5~~	~~174.9~~
~~Preserved Forest (Reforestation rates)~~	~~134~~	~~1.1 to 7.7 (2.0 for California Estimate)~~	~~147.4~~	~~268~~	~~1,031.8~~
~~Roads, ponds, etc.~~	~~31~~	~~0~~	~~0~~	~~0~~	~~0~~
~~**Post Conversion Totals**~~	~~**324**~~		~~**147.4**~~	~~**355.5**~~	~~**1,206.7**~~
~~**Net Change (decrease in carbon absorption)**~~			~~**-188.1**~~	~~**-254.9**~~	~~**-1,177.9**~~

~~*Assumes that the soil is saturated with carbon.~~

~~*Sources:*~~
~~*Greenhouse Gas Mitigation Potential in U.S. Forestry and Agriculture; 2005. Accessed on www.epa.gov June 2007.*~~
~~*Winrock International. Measuring and Monitoring Plans for Baseline Development and Estimation of Carbon Benefits for Change in Forest Management in Two Regions, March 2004. Accessed at http://www.energy.ca.gov/reports/CEC-500-2004-070/CEC-500-2004-070F.PDF on March 27, 2008.*~~
~~*Applied Geosolutions, LLC and Complex Systems Research Center, University of New Hampshire. Assessing Impacts of Rangeland Management and Reforestation of Rangelands on Greenhouse Gas Emissions: A Pilot Study for Shasta County, February 2007. Accessed at http://www.energy.ca.gov/2006publications/CEC-500-2006-108/CEC-500-2006-108.PDF on March 27,2008.*~~

Table 4-7
Onsite Average Annual Net Carbon Sequestration Estimates over 100-year Analysis Period

Current Use	Acreage (ac.)	Carbon Sequestration Rates (metric tons per acre per year)	Estimate (metric tons of carbon)
Pre-Conversion			
Forest	-	-	-
Standing live biomass	305	0.468[1]	142.88
Forest soils	305	0.197[2]	60.09
-		**Pre-Conversion Totals**	**202.97**
Post Conversion (Vineyard Operation)			
Reserved Forest (Streamside corridor and reserves)	-	-	-
Standing live biomass	151	1.730[1]	261.23
Forest soils	151	0.484[2]	73.08
Conversion (116 ac. vineyard, 38 ac. roads, ponds, etc.)	-	-	-
Standing live biomass	154	-0.429[1]	-66.07
All other pools	154	-0.246[3]	-37.85
Vineyard	-	-	-
Woody material	116	0.016[4]	1.86
Vineyard soils	116	0.081[4]	9.40
-		**Post Conversion Totals**	**241.77**
Net Change (increase in carbon absorption)			39.11 metric tons of carbon (144 metric tons of CO_2)

Notes:
[1] See Table 4-3 above.
[2] Annual carbon sequestration rates for forest soils were obtained from *The Potential of U.S. Forest Soils to Sequester Carbon and Mitigate the Greenhouse Effect*, Chapter 23, "The Potential of U.S. Forest Soils to Sequester Carbon," by Linda S. Heath, John M. Kimble, Richard A. Birdsey, and Rattan Lal, 2003.
[3] See Table 4-6 above.
[4] Annual carbon sequestration for vineyard woody material and soils was obtained from David Kroodsma and Christopher Field, "Carbon Sequestration in California Agriculture 1980-2000," *Ecological Applications* Vol 16, 1975-1985.

The vast majority of carbon loss would occur during the initial harvest and site preparation operations. However, as demonstrated above in Table 4-7, long-term sequestration to offset the initial spike in carbon release would occur throughout the planning period. In addition, the initial short term release of carbon would be partially addressed through the various methods/vineyard practices included in the project description (see Chapter 3 of the DEIR for more detailed information), such as:

- Utilizing chipped slash on-site will lessen the short term impact of carbon removals from the conversion area as the slash will not be burned.
- Supplementing large woody debris stocks on the reserve through to placement of cull logs and existing large downed logs from the conversion area

- Minimizing ripping (as noted above, deep ripping is not proposed)
- Planting/restoration of riparian vegetation

  As part of the implementation of the Timber Harvest Plan (THP), the applicant will implement a California native riparian planting plan to enhance the Patchett Creek riparian corridor, act as a filter for stormwater runoff from the proposed vineyards, and benefit biological resources along Patchett Creek.

  The objective of the riparian planting plan is to create a continuous riparian canopy along Patchett Creek. Species to be planted were selected based upon the species that now characterize the upper reaches of Patchett Creek on the project site. Species to be planted include interior live oak (Quercus wislizenii) and California bay (Umbellularia californica). Riparian planting will occur in gaps in the riparian canopy along Patchett Creek setbacks.

- Improved vineyard practices
- Use of vineyard cover crops

  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 foranalyzing 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~~. More specifically, as indicated in the Erosion Control and Mitigation Plan prepared for the proposed project, hillside vineyard rows and field avenues and perimeter roads (19 acres total) will include temporary and permanent cover crops. These permanent cover crops will be native species planted prior to October 15th.

The above analysis shows that the proposed project sequesters more carbon over the 100-year analysis period than the No Project – Timber Resource Management Alternative. This is due to the inclusion of the 151-acre forest reserve. As the redwood forest type has the potential to sequester carbon over long periods of time, the forest reserve creates the potential for significant carbon sequestration. Redwood forests in the North Coast of California have the capability of sustaining volume growth and in turn sequestration of carbon until stand ages of 80 to 100 years. Recent research indicates that redwood forests can continue to sequester significant amounts of carbon well past stand ages of 100 years. This analysis conservatively excludes increases in the standing dead and lying dead pools on the 151-acre reserve over the 100-year analysis period. Although excluded from this analysis, increases in the standing dead and lying dead pools within the reserve would serve to increase the net sequestration of the project over time.

Vineyard Vehicle and Equipment Emissions

~~Logging and tilling would result in emissions of GHG through the use of tractors, logging trucks, and chainsaws. In addition, tilling and deep-ripping of the soils would release carbon currently stored in the soil.~~ Following establishment of the project, vineyard operations would require the use of tractors and automobiles both for harvesting and transportation of workers.

Vehicles

The following is a general estimate of the yearly carbon dioxide creation of the proposed project based on the average employee vehicle miles traveled per day. The employee estimates are based on six months of peak harvest season trips, and six months of off-season trips. As noted in the *Transportation and Circulation* Chapter of the DEIR, Chapter 3.9, employee trips constitute home-to-work trips, lunch trips, errands, and other business trips. Ten percent of the employees are expected to carpool from home to work, while 50 percent are anticipated to carpool for lunch. Errands and other business would be expected to generate 0.2 trips per employee. To be conservative in the traffic analysis, TJKM assumed a high percentage of car ownership among seasonal workers. Based upon an average occupancy of three employees per car for carpooling, average employee traffic is estimated at 128 trips per day. ~~Estimates are not attempted for the use of tractors, power equipment, or large trucks. However, the numbers contained in Table 4-4 are still considered to be a conservative estimate of the proposed project's vehicle carbon dioxide production as the longest potential harvest season was presumed, and seven day work weeks were used on a year round basis.~~

As also noted in the *Transportation and Circulation* Chapter of the DEIR, Chapter 3.9, grapes are usually delivered in double gondola trucks carrying 22 tons of grapes each, or on flatbed trucks carrying 11 tons of grapes each. In order to estimate the number of trucks required to deliver grapes, a truck composition of 80 percent gondola trucks and 20 percent flatbed trucks was used. These assumptions are based on TJKM's familiarity and experience in studying similar vineyard projects in the area. On the average, each truck hauling grapes would carry 19.8 tons of fruit.

Using the TJKM formula, a 137-acre vineyard could yield up to 617 tons of grapes annually. This would require about 31 (= 617/19.8) trucks to haul the grapes during the harvest season. At an average harvest rate of 30 tons per day, approximately 21 maximum working days would be needed to harvest all 617 tons of grapes. The total number of weekday truck trips for the harvest season is approximately the total number of trucks divided by the number of weekdays for the harvest, multiplied by two trips (one inbound and one outbound) per truck. The result of this equation is an average of two truck trips per day required during the harvest season. This analysis assumes a maximum of three truck trips per day during the harvest season.

As shown in Table 4-~~4~~9, the vehicle emissions generated by the proposed project would annually generate approximately ~~231~~296.8 metric tons of carbon dioxide. ~~The figure does not account for tractor emissions, small engine emissions (e.g., weedeaters), or the initial emissions associated with logging and conversion of the site.~~

During the construction phase of the vineyard the vehicle emissions would total approximately 19.7 metric tons of CO_2 (See Table 4-8(A)).

Equipment

Table 4-8(B) includes a comprehensive list of the types of motorized equipment that are anticipated to be utilized during vineyard preparation and subsequent operation and maintenance.

Reservoir Installation

Sod and topsoil would be salvaged and stockpiled in a designated work area. Grading work would be conducted by a licensed contractor hired by the owner and under the direction of the Geotechnical Engineer of record. The Geotechnical Engineer would monitor excavations and backfill and evaluate the engineering properties of the soil by compaction testing and other means deemed appropriate by the Geotechnical Engineer. The Civil Engineer responsible for the earthwork plan would provide grade staking and dimensional controls either in person or by direction of the contractor or a licensed surveyor. Earthwork would progress by excavation of embankment support keyways inspected and approved by the Geotechnical Engineer. Subdrain installation within the keyways is expected for control of any incidental shallow groundwater under the impoundment, with drainage by gravity flow to rock armored outlets. The keyway would be filled and the embankment created using compacted lifts of engineered fill under direction of the Geotechnical Engineer. Trenching and installation of concrete encased drain lines and overflow pipe would occur within the earthwork area at the appropriate locations and times. Fill material would be excavated from within the impoundment area. Earthwork cut and fill volumes are balanced, such that import or export of soil or bulk materials is not anticipated.

Table 4-8 A
Vineyard Development: Vehicle CO2 Generation

Vineyard Site Preparation (one-time occurrence)

Season	Employees	Total Weekly Round Trips	Total Round Trips for Duration of Phase	Average Miles per Round Trip	Total Miles Traveled During Phase	Total Gallons[1]	Total CO2 (pounds)[2]
Reservoir Installation (4 weeks)	8 [3]	11 [3]	44	50	2200	108.4	2102.5
Vineyard Development							
4 weeks for initial grading and excavation	2	5 [4]	20	50	1000	49.3	955.7
1 week for smoothing of soil surface	2	5 [4]	5	50	250	12.3	238.9
5 weeks for vineyard trellis installation	21 [5]	35 [6]	179 [7]	50	8950	440.9	8553.2
10 weeks for vineyard irrigation installation	21 [5]	35 [6]	350 [7]	50	17500	862.1	16724.1
6 weeks for planting of vineyard	31	52	312	50	15600	768.5	14908.4
						Pounds of CO2	**43482.8**
						Metric Tons of CO2 ~~Per Year~~ [8]	**19.7**

[1] Overall average fuel economy for passenger vehicles of 20.3 mpg utilized (weighted by vehicle miles traveled [VMT] for passenger cars and light trucks). Per "*Emission Facts: Greenhouse Gas Emissions from a Typical Passenger Vehicle* ," US EPA, accessed online February 15, 2011 at http://www.epa.gov/oms/climate/420f05004.htm.

[2] 19.40 pounds of CO2 per gallon of fuel per "*Emission Facts: Greenhouse Gas Emissions from a Typical Passenger Vehicle* ," US EPA, accessed online February 15, 2011 at http://www.epa.gov/oms/climate/420f05004.htm.

[3] Employee total for Reservoir Installation comprised of the following: 2 employees max per day (assume carpool) to operate equipment; an additional 4-6 personnel (i.e., 4-6 individual vehicle trips) per week for periodic visits by engineer, consulting se

[4] One trip based on assumption that 2 employees required to operate equipment during phase would carpool each day.

[5] Number of employees includes 20 person crew and 1 supervisor.

[6] Consistent with Traffc Study prepared for the Fairfax Conversion DEIR carpool assumption is 3 persons per vehicle. Therefore, for a crew of 21, total trips per day is approximately 7. This equates to 35 round trips per week.

[7] Methodology = 35 weekly trips x 5 week phase = 175 total round trips + 4 additional round trips for miscellaneous equipment delivery and inspection.

[8] ~~Carbon generation was determined as follows (Miles per season * 366 grams per mile / 1000 grams per kilogram / 1000 kilograms per metric ton). For carbon dioxide generation - Proposed Methodology to Model Carbon Dioxide Emissions and Estimate Fuel Economy, Accessed on www.arb.ca.gov June 2007~~. Total pounds of CO2 divided by 2,205 since there are 2,205 pounds in 1 metric ton.

Table 4-8 B
Vineyard Development: Equipment CO2 Generation

Reservoir Installation		
Equipment Type	**Number of Pieces of Equipment**	**Total Duration of Use (weeks at 30 hours per week)**
Bulldozer sized D4	1	2
Bulldozer sized D8	1	2
Excavator	1	4
Earthmoving scraper of 20-30 cubic yard capacity or off-road trucks if soil is too wet	2	4
Water truck	1	4
Self-propelled compactor	2	4
4WD or crawler ag tractor with disc	1	3
Backhoe	1	4
Concrete Truck	1	1
Vineyard Development		
Equipment Type	**Number of Pieces of Equipment**	**Total Duration of Use (weeks at 40 hours per week)**
Crawler tractor (D-8 or smaller)	1	5
Water truck	1	5
Trencher (irrigation system installation)	1	10
Backhoe (drainage system installation)	3	16
Labor force ATVs, trailers	4	16
Labor force gas powered hand tools - chain saw, trench compactor, generator, string trimmers, etc.	3	16
Dump truck - rock riprap, drain rock	2	3
Bobcat or loader - rock management, supplies distribution	1	10
Post-pounding tractor (vineyard trellis and irrigation system installation)	2	8
75-hp tractor (planting of grapevines)	2	2
Metric Tons of CO_2 Per Year (includes reservoir installation and vineyard development)[1]		**1153.12**

[1] Tons of CO_2 per year for each phase of vineyard development construction calculated using the URBEMIS 9.2.4 emissions modeling program, and converted to metric tons.

Table 4-9
Vineyard Operation: Vehicle and Equipment CO2 Generation

Vehicle Emissions: Vineyard Harvest Season
(Note: Harvest will not occur for first 3 years of project's operation due to vineyard establishment)

Employee Trips

Season	Employees	Total Daily Trips	Average Miles per Round Trip	Total Miles Per Day	Total Miles Traveled	Total Gallons[1]	Total CO2 (pounds)[2]
Harvest (183 days)	72 seasonal + 6 full-time	128 (i.e., 64 round trips)	~~25~~ 50 miles	3200	585600	28847.3	559637.4
~~Off Season (182 days)~~	~~6~~	~~10 (.077 x 128)~~	~~25 miles~~				
						Metric Tons of CO2 Per Year [3]	**253.8**

Gondola Trucks

Season	Employees	Total Weekly Round Trips	Total Round Trips for Duration of Phase	Average Miles per Round Trip	Total Miles Traveled During Phase	Total Gallons[1]	Total CO2 (pounds)[2]
Grape Delivery (6-7 days)	N/A	10 [4]	12	200 [5]	2400	118.2	2293.6
						Metric Tons of CO2 Per Year [3]	**1.0**

Equipment Emissions: Annual Operation and Maintenance

Equipment Type	Number of Pieces of Equipment	Total Duration of Use (annual in hours)
75 hp farm tractor	2	250
Harvest rental tractors (35hp)	2	250
Sump Pump Motor	1	250
ATV	2	250
	Metric Tons of CO_2 Per Year[6]	**41.97**
Total Vineyard Operation Vehicle and Equipment Emissions (Metric Tons of CO_2/Yr)		**296.77**

[1] Overall average fuel economy for passenger vehicles of 20.3 mpg utilized (weighted by vehicle miles traveled [VMT] for passenger cars and light trucks). Per "*Emission Facts: Greenhouse Gas Emissions from a Typical Passenger Vehicle* ," US EPA, accessed online February 15, 2011 at http://www.epa.gov/oms/climate/420f05004.htm.

[2] 19.40 pounds of CO2 per gallon of fuel per "*Emission Facts: Greenhouse Gas Emissions from a Typical Passenger Vehicle* ," US EPA, accessed online February 15, 2011 at http://www.epa.gov/oms/climate/420f05004.htm.

[3] Total pounds of CO2 divided by 2,205 since there are 2,205 pounds in 1 metric ton.

[4] 10 trips based on assumption that 2 grape delivery trips would occur per day = 10 per week.

[5] Based upon Artesa Winery being located approximately 100 miles from the project site.

[6] Tons of carbon per year for equipment calculated using the URBEMIS 9.2.4 emissions modeling program, and converted to metric tons.

Sources: For employees and traffic trips - *Traffic Impact Study for Artesa Vineyards Project* , 2004.

Vineyard Development

As discussed in the *Project Description* Chapter of the DEIR, Chapter 2, the applicant proposes to perform all land clearing and development activities during spring, summer, and fall months. Following subsurface preparation, organic material (e.g., roots with a one-inch or larger diameter) would be gathered by hand or mechanical means, and would be either piled and chipped or removed from the site. The soil surface would then be smoothed and/or re-contoured using tractor equipment. This operation would involve "floating" the soil with a blade to create relatively smooth fields suitable for planting. According to the applicant, the vineyard layout is designed to minimize the need for grading. Smoothing would take approximately one week and would require a crew of one to two people and the use of a crawler tractor (D-6 or smaller). A farm tractor would then disc the soil in preparation for planting. Field terrace, row, and avenue locations would be laid out following discing.

The vineyard trellises and irrigation system would be installed concurrently using post-pounding tractors, trenchers, and/or backhoes. The post-pounding tractor would place the vineyard trellis posts, and a trencher or backhoe would be used to install the irrigation pipeline trenches. These trenches would be roughly one foot wide and two feet deep, and would be backfilled after installation of the irrigation pipelines.

The rootstock chosen for planting of the vines would be drought-tolerant and provide deep rooting patterns. Planting would require a crew and a 60-hp tractor. Vineyard blocks would be pre-irrigated using the installed drip irrigation system; then holes would be dug to accommodate roots, the vines would be placed, and soil around the roots would be compacted to support the vines.

As illustrated in Table 4-8(B), the one-time vineyard development phase will generate an estimated 1,153.12 metric tons of CO_2 from equipment emissions. Therefore, the total amount of CO_2 emissions generated during the vineyard development phase is approximately 1,173 metric tons (1,153.12 Mt CO_2 for equipment and 19.7 Mt CO_2 for employee vehicles).

Vineyard Operation and Maintenance

This section pertains to the types of mechanical motorized equipment that is expected to be utilized during vineyard operation and maintenance activities, which excludes vehicle trips associated with harvest employees and grape delivery trucks; these vehicle emissions are addressed above in Table 4-9.

Vineyard Vehicle and Equipment Emissions Summary

As illustrated in Table 4-9 above, the annual CO_2 emissions in metric tons per year associated with vineyard operations, which will occur starting three years after the vineyard is planted, are 296.8 metric tons of CO_2.

In addition, while the "one-time" emission of CO_2 during the vineyard development phase will be approximately 1,173 metric tons of CO_2 (See Tables 4-8(A) and (B)), annualized over the 100-year analysis period, this amount would be equal to approximately 11.7 metric tons of CO_2 per year. In order to obtain a comprehensive picture of the project's total annual CO_2 emissions, the 11.7 metric tons per year must be combined with the projected annual operational emissions of 296.8 metric tons of CO_2. Therefore, the combined total amount of CO_2 generated annually by the project, assuming that the construction phase emissions are annualized over the 100-year analysis period, would equal approximately 308.5 metric tons of CO_2. Given the results of Table 4-7, that is, the determination that the project will sequester approximately 144 metric tons of CO_2 per year, the net amount of CO_2 expected to be generated by the project on an annual basis is 164.5 metric tons of CO_2.

Comparison of Project Climate Change Analysis to other Alternatives

Offsite Alternative

As discussed in Chapter 6, *Alternatives Analysis*, of the DEIR, the Offsite Alternative would differ from the proposed project only in the location of the conversion area. In trying to satisfy most of the important site criteria (soils, elevations, slopes, and solar aspects), the offsite location would likely be located in the area surrounding Annapolis, or south of the town along Annapolis Road.

The Fairfax Conversion project site has a set of natural features around which 151 forested acres are being set aside. These natural features include existing stream channels and unique plant and wetland habitats. Without the identification of a specific offsite alternative location, it is not possible to determine whether similar characteristics exist on other available sites in the Annapolis region that may be similarly conducive for set aside purposes. In addition, the Fairfax Conversion project site currently contains approximately 19 acres of grassland habitat that would be developed as part of the vineyard. Other available offsite locations in the vicinity meeting most of the important site criteria may be entirely forested, which would result in more timbered acres being converted as compared to the proposed project. Overall, the findings of the greenhouse gas emissions analysis for the proposed project – that the vineyard would ultimately sequester more carbon on an annual basis as compared to managing the site for periodic timber harvest – would be expected to also apply to the Offsite Alternative, unless a sufficient timber reserve area cannot be feasibly incorporated into the overall vineyard design.

Reduced Acreage Alternative

As discussed in Chapter 6, *Alternatives Analysis*, of the DEIR, the Reduced Acreage Alternative would strategically reduce project acreages in three areas to reduce impacts to adjoining properties and on-site biological resources. While the proposed project would establish reserves for biological and cultural resources, the Reduced Acreage Alternative would expand the reserves around the resources by eliminating certain vineyard units; thereby maintaining these sites in their natural state. The Reduced Acreage Alternative would reduce the overall vineyard area by 33.2 acres (24.6 percent) by eliminating Unit Areas 1(a-d), 3, and 4.

The reduction in vineyard acreage would result in the greater retention of forested acres on the project site. Incorporating a larger timber reserve in the Reduced Acreage Alternative is significant given the substantial sequestration potential identified for the reserve area in the project analysis included above (See Table 4-7). Given the larger reserve, the Reduced Acreage Alternative would be anticipated to sequester more carbon per acre annually than the proposed project. In addition, decreasing the extent of timber harvest would correspondingly reduce the initial, short-term release of carbon, which for the proposed project, is projected to be 26.58 Mg C per acre on the conversion area (See Table 4-6 above). However, it is important to remember that, for the project analysis, once the 151-acre forest reserve standing live biomass and forest soils, as well as the vineyard woody vines and soils, are taken into consideration relative to their ability to continue to sequester carbon, the project would ultimately result in an increase in carbon sequestration over existing conditions of 39.11 metric tons of carbon per year. Overall, however, the Reduced Acreage Alternative is anticipated to have fewer impacts to global climate change as compared to the proposed project.

Summary

As directed by SB97, the California Natural Resources Agency adopted Amendments to the CEQA Guidelines for greenhouse gas emissions on December 30, 2009. On February 16, 2010, the Office of Administrative Law approved the Amendments, and filed them with the Secretary of State for inclusion in the California Code of Regulations. The Amendments became effective on March 18, 2010. CEQA Guidelines section 15064.4, states that, in determining the significance of greenhouse gas emissions, a "lead agency shall have the discretion to determine whether to use a quantitative approach or to "rely on a qualitative analysis or performance based standards." Given the challenges associated with determining a reasonable and proper quantitative significance criterion for GHG emissions when one does not yet fully exist, CAL FIRE has exercised proper discretion (and acted in accordance with the CEQA Guidelines on GHG emissions) in utilizing a qualitative significance criterion for the current project.

Notwithstanding the lack of a governing GHG emissions threshold, as explained above, CAL FIRE, using the best available information available and acting in accordance with CEQA, has established the above-referenced qualitative threshold ("an action that would block implementation of an ARB established regulation to reduce GHG emissions") to assess project GHG emissions. (See CEQA Guidelines, § 15064.7(a) ["[a] threshold of significance is an identifiable quantitative, *qualitative* or performance level of a particular environmental effect…"] (italics added).)

Furthermore, OPR's Technical Advisory entitled, *CEQA and Climate Change Addressing Climate Change Through California Environmental Quality Act (CEQA) Review* acknowledges that no statewide thresholds have been established, and states that "[a]s with any environmental impact, lead agencies must determine what constitutes a significant impact….individual lead agencies may undertake a project-by-project analysis, consistent with available guidance and current CEQA practice." Lead agency discretion to select a proper significance threshold for assessing GHG emissions is also specifically allowed under the amended CEQA Guidelines for assessing GHG emissions that were issued by the California Natural Resources Agency.

In formulating a threshold to measure the project's GHG emissions, CAL FIRE recognizes that climate change is a global issue. The solution to global climate change is complex, requires consideration of many factors, and collaboration and cooperation on a large scale. Given the lack of a governing quantitative project-specific significance criterion for GHG emissions, CAL FIRE has properly chosen to use a qualitative significance threshold for the project.

As demonstrated in detail above, converting 154 acres of timberland while preserving 151 acres of timberland as is currently proposed would result in an additional 19,185 Mg of CO_2e being sequestered over what would be sequestered if the current practice of a periodic harvest were to occur over the 100-year analysis period. If we were to account for carbon losses from soils carbon and other pools in Table 4-6 as well, the proposed conversion is estimated to result in a loss of 24.58 Mg C per acre on the conversion area, which equates to an annual loss of 0.246 Mg C per acre per year over the 100-year analysis period (24.58 Mg C per acre/100 years; see Table 4-7). Yet, as shown in Table 4-7, once the 151-acre forest reserve standing live biomass and forest soils, as well as the vineyard woody vines and soils, are taken into consideration relative to their ability to continue to sequester carbon, the project would ultimately result in an increase in carbon sequestration over existing conditions of 39.11 metric tons of carbon per year. Finally, the analysis evaluates the total amount of CO_2 generated during all phases of vineyard development, which would generate a one-time emission of approximately 1,173 (1153.12 metric tons of CO_2 from equipment during vineyard development + 19.7 metric tons of CO_2 from vehicles during vineyard development) metric tons, or 11.7 metric tons of CO_2 on an annual basis if the construction emissions were to be annualized over the 100-year study period. This

amount, in combination with the annual amount of CO_2 generated during vineyard harvest operations of 296.8 metric tons per year of CO_2 (See Table 4-9) would equal 308.5 metric tons of CO_2. As discussed above, because the project will sequester approximately 144 metric tons of CO_2 per year, the net amount of CO_2 expected to be generated by the project on an annual basis is 164.5 metric tons of CO_2, which is considered less than significant ~~Currently, the project site serves as a carbon sink for emissions generated elsewhere. Following conversion the project site would continue to sequester carbon; however, the sequestration rate would be reduced as a result of the decreased tree cover. The combination of the reduction in sequestration and the vehicle carbon generation indicates that implementation of the proposed project would result in a scenario that falls in between the sequestration of 975.7 metric tons under the High Estimate (231 metric tons [operational emissions] – 1,206.7 metric tons [sequestration]) and a net increase in carbon of 83.6 metric tons under the Low Estimate (231 metric tons [operational emissions] – 147.4 metric tons [sequestration]) of carbon dioxide equivalents per year. Use of the California Estimate on carbon sequestration indicates that implementation of the proposed project would result in the sequestration of 124.5 metric tons of carbon dioxide equivalents (231 metric tons [emissions] – 355.5 metric tons [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.~~ In comparison, California emits approximately in the context of the 492 million metric tons per year of carbon dioxide equivalents emitted in California.

~~It is also important to note that certain aspects of the project's design, as well as operational activities, would help to minimize the generation of greenhouse gases. For example, wildfires are a large source of carbon emissions and the conversion of timberland adjacent to rural residential communities, such as the proposed project, would reduce the potential for fires started in the community spreading into the nearby forests, which could result in catastrophic wildfires. To further reduce the project's potential to result in wildfires, and reduce emissions, the project would chip woody wastes from logging and vineyard trimming instead of burning, and utilize solar powered electric water pumps instead of diesel powered water pumps.~~ As is clear from the above analysis, the majority of project CO_2 emissions would be attributable to the combustion of fossil fuels in motor vehicles; however, the State has been working to adopt regulations that would reduce carbon dioxide emissions from fuel combustion state-wide. For example, the California Air Resources Board adopted the Low Carbon Fuel Standard (LCFS), which went into effect in January 2010, and among other things, promotes the use of alternative forms of fuel.[16] ~~Furthermore, t~~The proposed

[16] The LCFS regulation is expected to reduce greenhouse gas (GHG) emissions of the transportation sector in California by about 16 million metric tons in 2020. These reductions account for almost 10 percent of the total GHG emission reductions needed to achieve the State's mandate of reducing GHG emissions to 1990 levels by 2020 (cf. http://www.arb.ca.gov/regact/2011/lcfs11/lcfsnotice.pdf; accessed February 17, 2011).

project would be subject to the LCFS and any additional regulations established by the ARB in response to the direction provided by AB 32. Over time the project's greenhouse gas emissions would be reduced through the implementation of the low-carbon fuel standard, as well as increased vehicle fuel efficiency.

~~In addition, as stated in the traffic report, at least ten percent of project workers are expected to carpool to the project site.~~ It is also very important to consider the current function of the project site as a carbon sink. The project site currently provides a service to the community as regards the sequestration of carbon. Implementation of the proposed project would reduce the magnitude of the service provided; however, based upon the above analysis, the project will continue to sequester carbon at a greater rate that the proposed project would generate carbon emissions.

Currently, thresholds of significance for GHGs have not been identified by either the ARB, or the NSCAPCD. Early actions proposed by the ARB[17] are not strictly applicable to the proposed project, and the proposed project would be subject to any applicable State regulations as they are developed. Furthermore, in the context of statewide, nationwide, or global emissions, and considering the carbon sequestration that would continue to occur once the vineyards are planted, the proposed project's incremental contribution to this cumulative impact would not be cumulatively considerable. Therefore, the proposed project would have a ***less-than-significant*** impact on climate change.

Mitigation Measure(s)
None required.

The above additional analysis of greenhouse emissions that would be generated by the project, and the carbon sequestration dynamics on-site pre- and post-harvest, while detailed in its evaluation of all phases of the proposed project, only serves to demonstrate on a more comprehensive level that which was originally determined in the Fairfax Conversion DEIR – that is, the Fairfax Conversion project would result in a less-than-significant impact to climate change in large part due to its careful design, including the preservation of 151 forested acres, substantial planting of native vegetation along upper Patchett Creek, use of chipping versus burning for slash materials, etc.

Impact 4-8 on pages 4-21 and -22 of the DEIR is revised as follows:

Sedimentation

The project's long-term sediment contribution is projected to be less than existing levels. Specifically, as discussed in Chapter 3.7, Hydrology and Water Quality, upon implementation of the project sedimentation is estimated to decrease by ~~10~~24 to ~~21~~39 tons/yr. Other projects would also be required to implement BMPs; however, the efficacy of the measures implemented on other projects cannot be

[17] California Air Resources Board. *Proposed Early Actions to Mitigate Climate Change in California*, April 20, 2007.

> assured. Furthermore, additional sedimentation from construction is likely to occur. The effects of the proposed project, in combination with similar effects generated by other timber conversion and/or vineyard projects in the area, would be considered significant. However, as the proposed project would result in an estimated net decrease in sedimentation over time, the proposed project's incremental contribution to the significant cumulative impact would not be cumulatively considerable. As a result, with the project's BMPs and implementation of Mitigation Measures 3.7-2 (a-i) and 3.7-3 (a, b) required in the Hydrology and Water Quality chapter of the DEIR, the proposed project would have a ***less-than-significant*** cumulative impact.

The above changes to the cumulative sedimentation analysis for the project are as a result of the changes to the Erosion Analysis made since the release of the Fairfax Conversion DEIR for public review. For a full accounting of the revisions and the reasons justifying the need for the revisions, see Section 3.7, Hydrology and Water Quality above.

6.0 ALTERNATIVES ANALYSIS

Page 6-11 of the DEIR, second paragraph is revised as follows (see Response to Comment 10-85):

> The No Project – Timber Resource Management Alternative would consist of timber harvest and restocking of the areas proposed for vineyard conversion under the proposed project. Because the project site is currently rarely accessed by vehicles, the No Project – Timber Resource Management Alternative would result in short-term traffic impacts similar to the proposed project during timber harvesting periods. ~~No Project – No Action Alternative would not generate traffic, and would therefore not result in adverse effects to the local roadways and intersections. Furthermore, implementation of the No Project – No Action Alternative would not affect alternative modes of transportation.~~ The primary difference between the No Project – Timber Resource Management Alternative and the proposed project would be the reduction of vehicle trips related to vineyard operations, maintenance, and harvesting. Therefore, like the proposed project the No Project – Timber Resource Management Alternative would be unlikely to result in substantial adverse effects associated with transportation and circulation due to the low trip generation. However, the proposed project would also not result in significant adverse affects related to transportation; therefore, the No Project – Timber Resource Management Alternative ~~No Project – No Action Alternative~~ would result in transportation impacts similar to the proposed project.

The above revisions are for clarification purposes and do not alter the conclusions of the DEIR.

~~[i] *Greenhouse Gas Mitigation Potential in U.S. Forestry and Agriculture*; 2005. Accessed on www.epa.gov June 2007.~~
~~[ii] Winrock International. Measuring and Monitoring Plans for Baseline Development and Estimation of Carbon Benefits for Change in Forest Management in Two Regions, March 2004. Accessed at http://www.energy.ca.gov/reports/CEC-500-2004-070/CEC-500-2004-070F.PDF on March 27, 2008.~~

[9] ~~Applied Geosolutions, LLC and Complex Systems Research Center, University of New Hampshire. Assessing Impacts of Rangeland Management and Reforestation of Rangelands on Greenhouse Gas Emissions: A Pilot Study for Shasta County, February 2007. Accessed at http://www.energy.ca.gov/2006publications/CEC-500-2006-108/CEC-500-2006-108.PDF on March 27,2008.~~