DIABLO GRANDE SPECIFIC PLAN DRAFT ENVIRONMENTAL IMPACT REPORT

August 31, 1992

Prepared for:

Stanislaus County

LSA

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Prepared for:

Stanislaus County
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I. INTRODUCTION

This Environmental Impact Report (EIR) was prepared by LSA Associates, Inc. (LSA), under contract with the County of Stanislaus to provide environmental analysis of the proposed Diablo Grande Draft Specific Plan in conformance with the California Environmental Quality Act (CEQA) and its guidelines.

THE DIABLO GRANDE SPECIFIC PLAN

The 29,500-acre site is located in the Diablo Range, an eastern range of the California Coast Ranges, in southwestern Stanislaus County. It is about 35 miles east of San Jose, 20 miles southwest of Modesto, and about seven miles southwest of Patterson. The site consists of gently-sloping to steep ridges encompassing portions of three major watersheds (Orestimba, Crow, and Salado creeks). The project site, known as the Diablo Grande Ranch, or Oak Flat Ranch, is used for horse and seasonal cattle grazing. Two inholding properties, located within the Wilcox Ridge area, are not part of the project but are included in the EIR.

The entire site is proposed for a General Plan designation of "Specific Plan". In addition, all property within the site is proposed to have underlying or combining General Plan designations for specific land use types. These designations would be consistent with descriptions contained in the Stanislaus County General Plan. The site is designated Agriculture in the County's General Plan. Zoning of the site is proposed to be changed from A-2-160, General Agriculture District, with two dwellings allowed for 160 acres, to S-P, "Specific Plan," pursuant to Chapter 21.38 of the Stanislaus County Zoning Ordinance. The project would have underlying or combined zoning classifications based on districts contained in the Stanislaus County Zoning Ordinance as modified by the Specific Plan.

Under the General Plan amendment and rezoning, development of five villages is proposed. The villages would include recreational, residential, open space, resort, office, commercial, agricultural, and other land uses.

The following alternatives to the project also are addressed in this EIR: a No Project Alternative, a General Plan Buildout Alternative, a Mitigated Project Alternative, and an Off-site Alternative.

EIR OBJECTIVES

Previous environmental analyses and various technical reports for the project include the Environmental Inventory/Existing Conditions Report which analyzed Phase 1 of the project (LSA, 1990) and the Diablo Grande Project Initial Study which analyzed the entire project (LSA, 1991), in which the preparation of an EIR was recommended.

This EIR provides program-level environmental analysis of the Specific Plan as well as project-level analysis of the proposed Phase 1 of development. The program-level analysis enables government decision makers and the public to examine the overall effects of the proposed project and to avoid or reduce adverse environmental impacts. Upon preparation of detailed proposed preliminary development plans within the Specific Plan, future project-specific environmental studies will be provided. The project-level environmental analysis of Phase 1 is to determine the extent of potential impacts associated with the specific proposed land uses and to recommend mitigation measures to offset impacts.

This Draft EIR has been prepared in compliance with state, county, and local CEQA Guidelines, and has been compiled from a variety of sources including published and unpublished literature, background technical reports, maps, field studies, and original research. Its primary purpose is to serve as an objective informational document to be used by lead and responsible agencies, as well as the public, in their consideration of the project.

This EIR addresses the Diablo Grande Specific Plan's potential impacts on applicable traffic and circulation, noise, air quality, biologic, geologic, hydrologic, cultural resources, visual quality, land use, and public services and utilities issues. It is to accompany the Diablo Grande Specific Plan, and is subject to review by the county, local, and federal agencies and organizations, and the public. Comments received on this Draft EIR will be responded to in a Comments and Response document. That document, combined with this Draft EIR, will form the Final EIR presented to the County for certification.

SUMMARY

opic	Potential Impact	Mitigation Measures
nd Use	• Conversion of rangeland to developed uses would result in a significant adverse impact to the County inventory of rangeland (S).	• Continuance of some ranching activities on the site after build out shall be considered. To the satisfaction of the Planning Director, the applicant shall develop a program for maintaining some viable ranching activities in the Conservation Areas of the overall site, insofar as the program is economically feasible, can be accommodated by the project objectives, and does not detract from the open space value of reserves.
	• Development of the project would result in significant growth inducement to future development along the portion of Oak Flat Road near I-5. (SM)	• Off-site growth inducement along Oak Flat Road shall be mitigated by scenic easement or other means of requiring the maintenance of open space/agricultural uses adjacent to the road in perpetuity. Should the Board ultimately decide that development along that access road is appropriate, careful public and County review shall be conducted for any proposed development near Oak Flat Road.
	• Development of the entire project would result in the loss the loss of over 10,000 acres of open space. (S)	• To ensure that proposed Conservation Areas remain in open space in perpetuity, scenic or open space easements shall be established on that land. If easements of open space lands were not possible, the lands may be conveyed directly to the County or a deed restriction may be implemented.
	• Potentially may contain hazardous waste, although none are known to exist. (SM)	• A geotechnical survey and records search shall be conducted to confirm the absence of hazardous wastes on the Phase 1 site.

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Geology, Soils, and Seismicity	• Project grading could result in potentially unstable cut and fill slopes (SM).	• A detailed geotechnical evaluation shall be prepared as part of the project design process. The evaluation shall include the exploration and assessment of soil, bedrock, groundwater, and other subsurface geologic conditions as well as the evaluation of cut and fill slope stability. All engineering recommendations of this report shall be incorporated into the project plans. • Properly qualified field engineers shall be used to perform grading observation and testing during construction. The progress of the earthworks construction shall be periodically evaluated by a certified engineering geologist and/or geotechnical engineer, and incorporated into the Mitigation Monitoring Report. • All development and grading plans for the project shall be reviewed by a licensed civil engineer for compliance with Chapter 70 of the Uniform Building Code. The county shall make the final review of plans and provide any additional conditions of approval prior to issuance of the grading and building permits. The U.S. Army Corps of Engineers would be responsible for providing their approval and permits for grading done within their jurisdiction.

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- Potentially unstable slopes or cut and fill slopes created through project grading shall be stabilized through site-specific mitigation measures provided by a qualified geotechnical engineer. Such measures may include soil stripping, scarification and recompaction, and/or the reduction of the proposed cuts, the construction of a buttressed fill, benched slopes, and/or retaining walls. Retaining walls shall be subdrained and designed to resist lateral pressures appropriate to the size of the backslope.

The following specific measures shall be implemented prior to development of Phase 1:

- A grading plan shall be prepared for the earthwork necessary to construct the Oak Flat Parkway and Oak Flat Road. The plan shall be reviewed and approved by the County prior to issuance of the grading permit.
- A slope stability analysis of the large landslide along the Oak Flat Road access shall be included as part of the detailed geotechnical report for the project. The report shall provide recommendations for slope stability measures to ensure that future landsliding activities not impact the proposed roadway at its base. All recommended measures shall be incorporated into the proposed project plans.

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	• Although the proposed project has incorporated measures to reduce the impacts of grading, due to the scale and nature of the proposed land uses, project grading could still significantly alter the existing topograpy (S).	• Grading generally shall not be permitted on slopes greater than 25 percent. Any exceptions to this shall be at the discretion of the Public Works Department, and shall be required to include geotechnical analyses and erosion control plans. • In addition to the balancing of grading within each phase, grading activities shall be staggered within each phase so as to minimize the total area affected by grading at any given time. • Lots shall be set back from the toe of slopes as recommended by the geotechnical engineer. • The grading for the four development areas proposed east of Oak Flat Road, within Phase 1, should be reviewed to ensure that oak tree cover is not removed, and that the grading of the upslope hill areas are contoured to retain a natural appearance.

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	• Project grading could significantly increase the potential for on-site erosion and sedimentation of creeks (SM).	• Interim and Final erosion control plans shall be prepared and submitted to the County for review and approval prior to the issuance of grading permits. If earthworks construction is to take place during the rainy season, a wet weather erosion protection program shall be developed and implemented. Measures that would be needed at any crossings of Salado, Crow, or Orestimba creeks as well as their main tributaries include the installation of filter berms, sandbag or straw bailed barriers anchored by rebar, siltation retention fences, and the retention of natural vegetation between the erosion source and the sensitive area. Soil piles shall be covered at the end of each day. During the rainy season, these wet weather erosion protection measures shall be stored on site. Prior to the onset of wet weather, areas disturbed by partially or completed grading shall be hydroseeded. • To minimize erosion, siltation, and stream impacts, as little of the surface soils as possible shall be exposed during project grading and construction activities. • Excavated materials shall not be sidecast during site preparation, construction, and final grooming of cuts and fills, when such materials could come to rest in proximity to streams or gullies. Grading shall be conducted in such a manner that downslope roll of rocks, boulders, and other soil material is minimized.

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		• If a borrow site must be developed, it shall be located at an environmentally acceptable area, that avoids sensitive areas such as drainage courses or steep slopes where stream siltation or erosion would result. The borrow site shall be reclaimed following its use.
		• In areas which require the removal of brush but not grading, the root crowns shall be left intact, so as to retard soil erosion.
		• Project landscaping shall consist of deep-rooted drought resistant shrubs, trees, and ground covers instead of shallow-rooted species.
	• During the life of the project, all structures, utilities, and improvements would be subject to strong seismic shaking from earthquakes generated anywhere within the Bay Area and Diablo Range. Seismic shaking could induce landsliding, and strong shaking and cause considerable damage in structures not designed to withstand it. In addition seismic activity can cause the liquefaction of soil and foundation damage. All of these potential seismic hazards could cause injury to project employees and residents (SM).	• All project components (cut and fill slopes, structures, utilities, roadways) shall be constructed according to all State and local building design standards adopted by the County.
		• All interior fixtures, utilities, and furnishings shall be securely attached to the walls, floors, or ceilings to reduce the risk of damage or injury from falling objects. Homeowners shall be informed of appropriate measures to prevent toppling of personal property during earthquakes.
		• An earthquake emergency plan for the project shall be prepared and incorporated into the proposed project. The plan shall address what project residents and employees shall do in the event of an earthquake. Community shelter locations shall be established and emergency exit routes made known.

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		• The foundations of structures within areas of high liquefaction potential shall be extended down beyond the sandy deposits into solid bedrock material. Special engineering procedures shall also be implemented to ensure roadway protection from damage and/or closure due to liquefaction.
	• The project soils with high shrink-swell potential could damage project structures, buried utilities, and roadways if not properly mitigated (SM).	• Adverse effects of expansive soils shall be mitigated by extending building foundations below the zone of expansive soils subject to seasonal moisture variations, or by moisture conditioning and capping these soils with non-expansive soils to support footings and slabs if relatively shallow, expansive soils could be removed below buildings or other improvements. However, the expansive potential of materials exposed beneath the soils shall be evaluated to determine if soil removal if appropriate. Roadways may require relatively thick layers of aggregate base and subbase as well as a thick section of asphalt-concrete to minimize the potential damage due to shrinking and swelling of soils. The project geotechnical and structural engineers shall provide recommendations on the foundation design criteria and spacing, depth and diameter of foundation support piers upon review of soil strength data provided in the detailed geotechnical report.
		• Expansive soil removed from one area shall be placed in an area where the shrinking and swelling nature of the soil would not create significant adverse impact or result in damage to structures.

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	• Corrosive soil could adversely impact the condition of project foundations, buried utilities, and other susceptible public service facilities, resulting in extensive maintenance requirements (SM).	• Underground utilities, and subsurface steel and cement structures shall be protected from adverse effects of soil corrosion either through the provision of a buffer zone or trench filled with non-corrosive material such as gravel or neutral soil, or the encasement or lining of the underground project improvements.
Hydrology and Water Quality	• Based on planning-level estimates, development of the project could result in the covering of up to 1,100 acres of impervious surfaces, approximately three percent of the entire site. Surface runoff could increase by up to 840 acre-feet per year over the entire site due to the increase in impervious surface area. Development of Phase I could result in the covering of up to 365 acres with impervious surfaces, creating an additional 309 acre-feet of runoff per year. Increased runoff would result in the erosion and siltation of downstream waters (SM).	• An NPDES permit for stormwater discharge shall be obtained for the construction period of the project and for the operation of each different type of land use proposed, as required. • The amount of created impervious surfaces shall be minimized where feasible in order to allow local recharge of groundwater. • Landscape irrigation practices shall be designed to maximize infiltration of surface waters. • The final project drainage system shall be designed to control runoff volumes and velocities efficiently, both during and after construction. • Erosion control measures shall be provided along unprotected creek channels prone to erosion from receiving outfall structure flows.

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Topic	Potential Impact	Mitigation Measures
		• Project drainage system shall conform with County drainage ordinance and FEMA and Regional Water Quality Control Board regulations.
	• Increased surface runoff could result in localized flooding within the project site if drainage system is not adequately sized to accommodate the 10 and 100 year storms and could add cumulatively to flooding problems downstream (SM).	• Floodplain studies shall be conducted along the Salado, Crow and Orestimba creeks. Study findings shall be incorporated and mitigated (if necessary) in the final drainage plans prior to their approval.
		• The final project drainage systems shall be designed to ensure no net increase in 100-year storm flows downstream of the site.
		• Project structures, utilities, and roadways shall be located outside the 100-year floodplain.
		• Project drainage system shall be regularly cleaned and maintained to ensure adequate drainage flow. If stream improvements are necessary to accommodate expectant flows, all relevant Corps and Fish and Game permits shall be obtained prior to work.
	• Project grading activities could adversely impact the quality of surface waters from siltation (SM).	• Grading shall be confined to the dry season, or be mitigated as summariezed on p. II-5 paragraph 1.
		• The geotechnical report shall include the exploration of subsurface hazardous materials. Appropriate remedial measures would be taken prior to the onset of any grading activities.

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		• Interim and final erosion control plans shall be prepared prior to approval of grading permits. Temporary measures may include siltation fences, berms, siltation ponds and hydroseeding. Permanent measures include stable final slopes, retaining walls, positive drainage away from exposed slopes and project landscaping. If grading is expected to extend into the rainy season, a wet-weather erosion control plan shall be prepared and approved. Erosion control plans shall conform with County grading and building ordinances and with the required Regional Water Quality Control Board NPDES permit.
		• Natural vegetation shall be preserved where feasible, especially along stream channels.
	• Runoff from developed areas would be expected to contain urban pollutants such as oil and grease which would add to surface and possibly groundwater quality degradation. (SM)	• Project runoff from developed areas shall be directed towards the appropriate collection basin.
		• Streets and parking areas shall be frequently cleaned and collected materials properly disposed of.
		• The project shall incorporate measures and practices which would prevent pollutation, as stipulated in required NPDES permits. The project shall also incorporate a stormwater discharge monitoring program to ensure compliance with State and federal water quality objectives.
		• Drainage system catch basins shall include oil and grease traps to filter the heavier pollutants, as determined by the County Department of Public Works. The traps shall be cleaned frequently.

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	• Irrigation water from the proposed off-site ground- water well and from the on-site wastewater treatment plant could adversely impact surface and groundwater quality shall their quality fall below the level required by the DHS and RWQCB (SM).	• Both the off-site groundwater well source and the treated effluent produced by the project wastewater treatment facilities shall be periodically monitored to ensure compliance of discharge permits.
	• Septic systems installed for the 100 estate lots proposed within the Conservation Areas may fail due to inferior soil and slope conditions and cause surface and groundwater quality impacts (SM).	• Site-specific soil studies shall be prepared for each proposed estate lot to determine if soil and slope are suitable for a septic system. Those lots with unacceptable conditions shall either be hooked up to the nearest sanitary sewer, or not developed.
	• Unless adequately mitigated, fertilizers and pesticides used within the proposed golf courses could significantly impact surface and groundwater quality (SM).	• Once detailed golf course designs are prepared, site-specific risk assessments and integrated golf course management programs shall be prepared. Reports shall include a detailed analysis of issues relevant to the sites, assessments of potential impacts to water quality, and measures and management practices to minimize impacts.
		• A list of all fertilizers and pesticides proposed for use in management plans shall be submitted to the Department of Agriculture for review and comment. Any restricted material proposed for use would require special permit and use conditions.
		• High maintenance golf course areas shall be minimized while the use of native trees and grasses shall be maximized to reduce the water, nutrient, and chemical application requirements.

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		• A vegetative buffer shall be maintained between fertilized areas and on-site creeks. • To reduce the potential for leaching, golf course soils shall be amended with organic matter and slow release nitrogen sources shall be used instead of more soluble compounds. • Chemicals shall be applied according to the manufacturers specifications and in ways to increase their effectiveness while decreasing the need for future applications. • All golf course chemicals shall be properly stored, in accordance with the Department of Agriculture and the Office of Safety and Health Administration requirements. Maintenance employees shall be properly trained in the storage, handling, and clean-up of chemicals prior to application. • The effectiveness of the golf course management plan shall be verified through periodic monitoring of nearby surface water and groundwater quality, and the plan shall be adjusted as necessary to ensure effectiveness.
Vegetation and Wildlife	• The project could result in the loss of up to 50 percent of the habitat present in the site. (S)	• See specific mitigations below.

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Topic	Potential Impact	Mitigation Measures
	• Estate lot development would significantly affect wildlife use of major portions of the site, present barriers to wildlife movement, and disturb larger wildlife species. (S)	• Limit development areas on estate lots. • Limit pet access to undeveloped areas of estate lots. • Avoid estate lots near wildlife corridors, and cluster estate lots. • Require strict environmental review of subdivision of estate lots. Subdivided lots should not exceed 100 total lots. • Limit development of estate lots to near villages. • Require site-specific biological surveys of each lot before approval of each estate development. • Prohibit grading and fences near "blue-line" streams. • Limit removal of oaks on estate lots to five percent of oaks on the lot, or one tree if fewer than 20 trees on a lot.
	• The development would result in the loss of oak woodland. (SM)	• Where project grading is planned in oak woodland habitat, confine grading to grassland areas where trees are not present. Where removal of oaks and other native trees is unavoidable, map locations of oaks present and replace trees lost on a 5:1 ratio and design a long term management and monitoring plan for tree maintenance. Management plans should be approved by the County prior to final map approval for each village.

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	• Project development could result in the loss of riparian vegetation along the major drainages, stock ponds, and springs. (SM)	• Replace riparian woodland lost to development. Develop a management plan for this replacement. Management plans should be approved by the County prior to final map approval for each village.
		• Where feasible, stock ponds shall be left intact for use by wildlife. If any ponds are planned for removal, they shall be replaced by ponds of equal size located in the Conservation Areas.
	• Stream road crossings which are culverted would impede wildlife using the drainage channels for daily and seasonal movements. (SM)	• The EIR consultant recommends that stream road crossings be made by construction of bridges or oversize box culverts which require no additional fill beyond placement of the box culvert over major streams (Salado, Crow, and Orestimba creeks) and oversized box culverts for tributary streams for wildlife access. The appropriate crossing structure shall be approved by the U.S. Fish and Wildlife Service, California Department of Fish and Game, Army Corps of Engineers, and the County Department of Public Works.
		• Springs should be incorporated into project open space. Where springs would be lost to development, water from these springs or other sources of water shall be piped to protected areas to re-establish these sources of water.

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	• Preliminary layouts of the five villages proposed for the project site provide no wildlife corridors between the villages and the Conservation Areas to the west and east of the site. (SM)	• The Conservation Areas shall be linked with open space areas such as golf courses and the landscaped areas between areas of development to provide uninterrupted wildlife access corridors in the valley where practical. Corridors connecting Conservation Areas will average 1/4 mile in width and will be no narrower than 220 yards in width.
	• Heavy grazing by livestock in the proposed estate lots in the Conservation Areas would reduce wildlife habitat value. (SM)	• Restrictions on the number and location of livestock shall be implemented to prevent overgrazing in open space areas.
	• Use of trails could adversely affect wildlife use. (LS)	• Trails shall be carefully planned to avoid areas of high wildlife use.
	• The proposed access roads, parkways and collector roads would result in an increase in the number of wildlife road-kills, especially near creeks. (SM)	• Primary and collector road construction and improvement shall include undercrossings at regular intervals for wildlife to reduce wildlife road-kill. It is recommended that road crossings be made by construction of bridges over major streams and of oversized box culverts in tributaries to provide continuous corridors for wildlife along drainages. The appropriate crossing structure shall be approved by U.S. Fish and Wildlife Service, California Department of Fish and Game, Army Corps of Engineers, and County Department of Public Works.

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	• Potential San Joaquin kit fox road kills in the eastern areas of the site and entry road area are a potentially significant impact associated with the access roadway. (S)	• Wildlife "underpasses" should be incorporated into the design of the planned roadways to allow wildlife to cross under rather than over the roads to reduce the number of wildlife road kills. These undercrossings should be a minimum of four feet by six in size and installed wherever roadways cross tributary streams. In areas of mapped kit fox range, provide road undercrossings six feet wide by four feet approximately every 1/4 mile. Existing fencing should be replaced along the roadways, using hog-wire fencing with mesh size approximately six by eight inches and topped with three strands of barbed wire. This would allow kit fox to pass through the fence and prevent coyotes and other large predators of kit fox from passing through the fence. The fencing should be placed along the right-of-way boundary. These fences would serve to confine cattle present in the area. • Set maximum enforced vehicle speed limits at 35 to 45 miles per hour on the primary access roads and 25 miles per hour on the connector roads to reduce road-kills.
	• The project could result in the introduction of exotic plant species used in private and commercial landscaping. (SM)	• Development landscaping should include the use of native plant species.
	• The introduction of dogs and cats would result in the predation and harassment of wildlife species. (SM)	• Strict regulations shall be established to enforce leash laws for dogs and cats.

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	• The use of fertilizers, herbicides, and pesticides on residential and commercial landscaping and oil, grease, and other pollutants resulting from runoff from streets and driveways could enter drainages and ponds and have an adverse affect on water quality for wildlife and riparian vegetation. (SM)	• Project plans shall include golf course and landscaping management plans to minimize pollution from fertilizers, pesticides, and grease, oil, and chemicals associated with roads and driveways. Management plans should be approved by the County prior to final map approval for each village.
	• Species of special concern present or potentially present in the project site could be affected by the proposed project. (SM) The serpentine outcrop present near the western boundary of the Wilcox Ridge Conservation Area may support plant species of special concern. Planned public access to this area could result in threats to these populations if present. (SM) The proposed development could result in loss of populations of thirteen plant species of special concern potentially present in the project site. (SM)	• Avoid areas where plant and wildlife species of special concern are located where possible, such as in the vicinity of the prairie falcon eyrie, and develop specific mitigation measures where avoidance is not possible. Surveys for the potential presence of species of special concern will be required for the remainder of the site outside of Village 1 prior to issuance of construction permits.

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	• San Joaquin kit fox: the portions of the proposed access roadways along Salado, Crow, and Orestimba Creeks in the lower elevations will result in loss of kit fox habitat and may directly impact kit fox potentially present in the area by the removal of dens and road-kills of individual animals. (S)	• Wildlife "underpasses" should be constructed at regular intervals along the planned roadways to allow wildlife to cross under rather than over the roads to reduce the number of wildlife road kills. These undercrossings should be four feet by six in size and spaced approximately every 1/4 mile. Culverts installed for other uses, such as stream crossings, are suitable for this purpose. In areas of kit fox habitat, provide road undercrossings six feet wide by four feet approximately every 1/4 mile. Existing fencing should be replaced along the roadways, using hog-wire fencing with mesh size approximately six by eight inches and topped with three strands of barbed wire. This would allow kit fox to pass through the fence and prevent coyotes and other large predators of kit fox from passing through the fence. The fencing should be placed along the right-of-way boundary. These fences would serve to confine cattle present in the area. Maximum enforced vehicle speed limits shall be set at 35 to 45 miles per hour on the primary access roads and 25 miles per hour on the connector roads to reduce road-kills.
	• The potential loss of riparian habitat could result in loss of habitat for California tiger salamander, California red-legged frog, and southwestern pond turtle. (SM)	• Where riparian habitat is unavoidably disturbed or lost due to road construction, that habitat shall be rehabilitated or replaced in like amount.

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	• Development in areas dominated by grassland would result in loss of habitat for California ground squirrels and other species which are important prey species for predators such as golden eagle, prairie falcon, American badger, and for nesting of burrowing owls. (SM)	• Ground squirrel habitat shall be retained in Conservation Areas. Poisoning of squirrels shall be prohibited in Conservation Areas. Use of poisons in other areas shall be limited to those poisons that are of low risk to non-target species.
	• The proposed project would result in human activity near cliffs forming rock outcrops which provide nest sites for prairie falcons and other raptors. (S)	• No development should occur within 1/4 mile of the cliffs. The park surrounding the cliffs should be passive in character so that human activity in the vicinity of the cliffs is not encouraged.
	• Ferruginous Hawk. The loss of grassland habitat along the western edge of the San Joaquin Valley due to access road construction would result in the loss of ferruginous hawk winter habtiat. (LS)	• Limit development entry roads as described in Land Use mitigations.
Cultural Resources	• Direct impacts from grading, excavation, trenching, etc., may impact cultural and historic resources. (SM)	• Prior to construction, a complete evaluation of resources within each development area shall be undertaken. Impacts to sensitive resources shall be minimized through avoidance, capping, limiting project-related excavation, monitoring, and collection of surface artifacts by a qualified archaeologist.

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		• All standing historic structures at the Oak Flats Ranch shall be presered or otherwise mitigated as recommended by the architectural historian.
		• The local community of Northern Yokuts shall be contacted regarding their concerns.
		• A monitoring program shall be formulated for the Phase 1 area.
	• Secondary impacts from unauthorized surface collection of prehistoric or historic artifacts, looting of prehistoric graves, vandalism, etc., may impact cultural and historic resources, including the pictographs in the Phase 1 area. (SM)	• Access to the pictograph area and other sensitive resources shall be restricted.
		• Trails shall be located away from sensitive cultural resources.
		• All sites shall be periodically inspected by an archaeologist, and any uncovered artifacts or bones should be re-buried where found.
Public Services and Utilities	• The project at buildout would require up to 12,880 acre feet of off-site water to be supplied to the site. Depending on the source of this water, it could affect local wells and contribute to the depletion of local aquifers or could have other off-site impacts. (S)	• The long-term environmental impacts of the off-site Yuba water diversion and storage at Madera Ranch area shall be studied prior to approval of those supplies.

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		• The applicant should establish a system of monitoring wells adequate to determine if the project would affect nearby wells. These could consist of existing wells. These wells should be monitored on a daily basis, and any correlation with pumping by Western Hills Water District for Diablo Grande should be noted. Monitoring wells should be established prior to operation of Western Hills Water District wells. Monitoring results should be provided monthly to the County Environmental Resources Deparment. • If groundwater levels at wells near the Western Hills Water District well sites decline by 10 percent or greater, and that decline can be reasonably correlated with increased pumping from the Western Hills Water District wells, Western Hills should offset increased pumping needs by allocating portions of their Salado Water District water allocations to the impacted neighboring owners. • Because long-term water supplies beyond the five-year buildout have not been assured, development requiring over 1,200 acre-feet per year of water shall not be permitted unless the applicant can show to the County's satisfaction that adequate water supplies have been made available, and that environmental impacts of those sources have been studied and mitigated per CEQA requirements.

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Topic	Potential Impact	Mitigation Measures
	• The project at buildout would generate up to two million gallons per day of waste water. Two water treatment plants and three waste water treatment plants would be required, which would be adequate to serve the project. (LS)	• Treatment plants shall meet the requirements of the California DOHS, Stanislaus County Department of Health Services and the American Waterworks Association.
	• Excess reclaimed water may be released into the creeks. (SM)	• Prior to discharge of excess reclaimed water into the creek, the Stanislaus County Department of Environmental Health, California DOHS, and the RWQCB shall confirm that no deleterious impacts would occur as a result of this release.
	• Sludge would be produced by the water treatment plants and sewerage treatment plants. This could contaminate soil or groundwater if improperly disposed of. (SM)	• Sludge produced by the water treatment and sewerage treatment plans shall be contained, handled, and disposed of properly to avoid soil or groundwater contamination.
	• Residential and commercial uses would generate 22,000 tons per year of solid waste. The water treatment plant would generate 16,000 tons per year of alum sludge, and the wastewater treatment plant would generate 30,000 tons per year of sludge. Only the alum sludge would have to be entirely landfilled. This could significantly affect existing landfill capacity. (SM)	• The project shall conform to provisions of the County SRRE to reduce the amount of waste that is landfilled. Curbside pickup of recyclable or a collection facility for recyclable shall be provided within the development. • When Fink Road landfill is nearing capacity, studies shall be conducted for later phases of development to determine whether a Countywide or on-site landfill would be required to accommodate the proposed project. Environmental impacts of any such landfill would need to be assessed.

Key: LS = Less than significant
SM = Significant but mitigable
S = Potentially significant after mitigation

Topic	Potential Impact	Mitigation Measures
		• Composting and land application of sludge from the wastewater treatment plants shall be investigated for later phases of the development.
	• The project would add significantly to the demand for police and fire services, and would require additional fire and police staff, equipment, and facilities. (SM)	• Facilities and/or developer fees shall be provided to meet the demands of the project for fire and polices services. To reduce the impacts on fire and police services, the project shall comply with fire protection policies of the Diablo Grande Specific Plan and recommendations of the West Stanislaus County Fire Department an the Stanislaus County Sheriff's Department.
	• The project would add to the demand for medical services in the area, including those provided by the Patterson Hospital District. (SM)	• The applicant and the Patterson Hospital District should negotiate an appropriate funding mechanism and developer fee commensurate with Diablo Grande's impact on the District, or show, to the County's satisfaction, that other hospital facilities are adequate to meet the project's needs.
		• Diablo Grande shall make space available at its Public Safety Center for an emergency medical vehicle.
	• A significant number of students would be generated by the proposed project, which would significantly impact local school facilities if not mitigated. (SM)	• If developer fees do not cover the cost of new school facilities or services, additional funding mechanisms such as a Special District shall be coordinated with the Newman-Crows Landing Unified School District.
	• Parks and recreation areas and facilities would be provided at the site. (LS)	• Planning staff and the County Planning Commission will review the detailed development plans subject to recommendations from the Stanislaus County Parks and Recreation Department for locations, sizes and contents of parks and recreation areas and facilities.

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Topic	Potential Impact	Mitigation Measures
	• Extension of gas, electric, telephone and cable lines would be required. Facilities would also be required. (LS)	• The project applicant shall be financially responsible for expansion of facilities and extensions. Residences shall be positioned to reduce energy use.
Visual Resources	• Development of the entire site would cause potentially significant visual impacts, affecting the views of future residents and visitors. (S)	• Final site, landscaping, and grading plans shall be sensitive to on-site landforms and features which provide the site with its visual impressions, including its rolling topography, ridgelines, clusters and specimen trees, riparian drainageways, and rock outcroppings. To maintain the integrity of the existing landscape, the project landscape plan shall incorporate the elements of the existing vegetation in terms of size, color, and texture, so that new vegetation would eventually blend in with the existing indigenous species. Screening vegetation shall be strategically placed. Architectural detailing shall include sensitive choices of texture, paint color, and finish to help integrate project features into the landscape.
		• Photomontage or CADD simulations of visible development from key viewpoints shall be prepared to the satisfaction of the Planning Director. Final plans shall incorporate any mitigation measures resulting from these montages.
	• Portions of the hill Conservation Area visual quality could be adversely impacted by Phase 1 development which encroaches on those areas. (SM)	• The four development areas proposed east of Oak Flat Road within Phase 1 shall give special treatment to ensure that significant oak cover is not removed and that the bases of the adjoining hills are contoured or feathered to retain a natural appearance.

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Topic	Potential Impact	Mitigation Measures
Transportation and Circulation	• Addition of project traffic would result in unacceptable peak hour levels of service at the following locations: (SM)	
	-- Sperry Road/Ward Avenue	• This intersection shall be signalized where warranted. Significant improvements shall be made to the northbound approach to provide a left turn lane, a shared through-left turn lane, and a shared through-right turn lane. Improvements shall be made to the eastbound intersection approach to provide a shared through-left turn lane, a shared through-right turn lane, and a right turn lane.
	-- Ward Avenue/Marshall Road	• This intersection shall be signalized where warranted. Improvements shall be made to the southbound approach to provide two through lanes and a left turn lane.
	-- Ward Avenue/Oak Flat Road	• This intersection shall be signalized where warranted. Improvements shall be made to the southbound approach to provide a free right turn lane and improvements to the eastbound approach to provide two left turn lanes and a right turn lane.
	• Addition of project traffic would result in unacceptable peak hour levels of service along Oak Flat Road between Ward Avenue and the project site. (SM)	• Oak Flat Road shall be widened to four lanes when warranted.

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Topic	Potential Impact	Mitigation Measures
	• Addition of project traffic and cumulative development (including Lakeborough and the City of Patterson) would result in unacceptable daily levels of service along the following roadways: (SM)	
	-- Sperry Road	• Diablo Grande shall contribute proportionately to the following improvements: - Sperry Road shall be widened to provide two additional lanes (i.e., widen to a six-lane facility).
	-- Ward Avenue	- Ward Avenue shall be widened from two to four lanes.
	• Addition of project traffic would result in unacceptable peak hour levels of service at the following locations: (SM)	• Frontage Road shall be constructed between Oak Flat Road and Del Puerto Canyon Road, and the following specific intersection improvements shall be made:
	-- I-5 Southbound/Sperry Road	- The eastbound approach shall be improved to provide an additional through lane.
	-- Sperry Road/Ward Avenue	- The northbound approach shall be improved to provide a free right turn lane. The southbound approach shall be improved to provide a free right turn lane. An addition shall be made to the eastbound approach to provide a separate right turn lane.
	-- Ward Avenue/Marshall Road	- The northbound approach shall be improved to provide an additional through lane and a separate right turn lane.

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Topic	Potential Impact	Mitigation Measures
	-- Ward Avenue/Oak Flat Road	- The northbound approach shall be improved to provide a left turn lane. The southbound approach shall be improved to provide a separate right turn lane. The eastbound approach shall be improved to provide separate left and right turn lanes.
	-- I-5 Northbound/Ward Avenue	- The eastbound approach shall be improved to provide an additional through lane. The westbound approach shall be improved to provide an additional through lane.
	On Site Circulation	
	• Addition of project traffic would result in unacceptable peak hour levels of service along Oak Flat Road. (SM)	The following on-site mitigation measures are recommended. While not based upon technical findings, they represent reasonable requirements based upon professional judgement, experience and standard engineering practice. • Oak Flat Road within the site can be four-lanes as shown on the Specific Plan; however, the following traffic control measures shall be used: - Stop sign controls at all major intersections shall be provided on all approaches. - Driveway access and egress shall be restricted for a distance of at least 100 feet from the curb return tangents at all intersections.

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Topic	Potential Impact	Mitigation Measures
		- All major intersections at the Town Center and Shopping Center areas shall provide for adequate exit storage lane capacity. (Parking lot circulation shall be designed to restrict access from parking lot traffic lanes to the exiting street segments to provide any required vehicle storage.) • Emergency vehicle access shall be provided. • Ultimately, access to the project is required along Oak Flat Road with a four-lane road, through the Lakeborough project via a two-lane arterial, and to Stuhr Road via Orestimba Road via a two-lane arterial. • All major collector streets shall provide capacity for center two-way left turn lanes and left turn storage lanes at major intersection approaches. • Residential and recreational parking demand shall be met off-street with no parking provided along major collector roadways. Parking along minor collectors fronting on residential property can be allowed. • Consideration shall be given to restricting direct driveway access to all major arterials and major collector streets. Minor collector roadways shall also be given back-lot treatments if feasible. • Oak Flat Road shall be widened to four lanes prior to 75 percent of Phase 1 development (700 peak-hour trips), if warranted by traffic studies at that time.

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Topic	Potential Impact	Mitigation Measures
Air Quality	• Construction activities would result in temporary localized increases in small-diameter suspended particulates, termed PM_{10}, and a small temporary increase in exhaust emissions due to construction vehicles and equipment. Residents and workers at Diablo Grande could be exposed to elevated levels of PM_{10} produced by continuing construction of later project phases. (SM)	• Dust emissions related to construction shall be reduced by: - Sufficiently watering all excavated or graded material. - Ceasing all clearing, grading, earth-moving, or excavation activities when wind speed exceeds 20 mph. - Sufficiently watering or securely covering all material transported off-site. - Minimizing the area disturbed by clearing, grading, earth-moving, or excavation operations. - Seeding and watering all inactive portions of the construction site until cover is grown. - Limiting vehicle speed to 15 mph in unpaved areas. - Sweeping adjacent streets as needed to remove accumulated silt.

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Topic	Potential Impact	Mitigation Measures
	• Phase 1 project ROG and NO_x emission increments are equal to 0.29 and 0.53 tons/day, respectively. This is 0.79 percent and 1.35 percent, respectively, of all ROG and NO_x emission increments in Stanislaus County. Total project buildout would contribute 0.70 and 1.45 tons/day of ROG and NO_x, respectively, to the air basin. This represents 1.87 percent and 3.53 percent of all ROG and NO_x in the County. Emissions growth of this magnitude in a non-attainment area would be considered significant. (S)	• The most effective means of reducing ozone precursor emissions from motor vehicles would be to reduce the number of vehicle trips generated by Diablo Grande. A list of such Transportation Demand Management (TDM) strategies would include: - Develop a transportation plan that would promote the use of and offer incentives for ridesharing and transit. - Apoint an on-site Transportation Coordinator to coordinate and implement employee and resident transportation programs. - Provide a link to existing regional mass transit systems and subsidize employee and resident purchase of transit passes. - Establish an on-site transit system. - Promote the use of low-emission (e.g., natural gas fueled) or no-emission (e.g., electric powered) vehicles on-site. - Promote bicycle and pedestrian use for on-site travel and establish bicycle routes and storage facilities. Considering the magnitude of Diablo Grande's air pollutant emissions, even the implementation of a comprehensive set of TDM strategies would not reduce project emissions to insignificance.

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Topic	Potential Impact	Mitigation Measures
		• The project proposes to encourage the use of battery-powered vehicles for trips within the community. Parking areas for battery-powered vehicles will be provided at all commercial, professional, public, and employment centers, and every house constructed in the project will be equipped with electrical facilities for recharging batteries for these vehicles.
	• Potential toxic and odor emissions from the on-site Research Campus, the Fink Road Waste to Energy Facility, and from nearby agricultural uses could be carried toward Diablo Grande by the local winds. Toxic air pollutants and odors could have significant adverse impacts on sensitive receptors on the project site. (SM)	• Any on-site commercial or residential use which may emit significant quantities of toxic pollutants should operated under permit of APCD and State rules governing the application and use of pesticides shall be followed.
Noise	• Construction noise after occupancy of initial Phase 1 units could disturb those occupants. (SM)	• Limit construction activities to 7:00 a.m.-7:00 p.m. on weekdays once initial houses are occupied.
		• Schedule construction activities with highest noise potential for periods when background noise levels are highest.
		• Require the contractor to employ quietest available equipment and muffle or otherwise control equipment noise.
		• Noisy operations should be performed off-site or on portions of the site distant (i.e., over 1,000 feet) from residential neighborhoods.

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Potential Impact	Mitigation Measures
• Noise levels along I-5, SR 33, and all local roadways would increase substantially with traffic from the project plus with project and cumulative development. (SM)	• The applicant shall sufficiently shield sensitive receptors and/or set back receptors from roadways.

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III. PROJECT DESCRIPTION

A. *LOCATION AND SITE DESCRIPTION*

The project site is located in the Diablo Range, on the eastern side of the California Coast Ranges, in southwestern Stanislaus County. The Diablo Range forms the western rim of the San Joaquin Valley. The site is about 35 miles east of San Jose, 20 miles southwest of Modesto, and about seven miles southwest of Patterson (see Figure III.A-1). The project site is approximately five miles west of Interstate 5 (I-5) via Oak Flat Road. Figure III.A-2 shows the project site boundaries.

The site consists of 29,500 acres of gently-sloping to steep ridges encompassing portions of three major watersheds (Orestimba, Crow, and Salado creeks). The interior valleys are generally flat or gently sloping with rolling hills. These are bordered by steep-sided ridges. Site elevations range from less than 1,000 feet above mean sea level (msl) at the eastern edges of the site to over 2,600 feet msl at Mike's Peak and Copper Mountain. Several nearly level valleys also occur within the site, the largest of which is Oak Flat. The vegetation of the site is a mosaic of grassland and oak savannah/ woodland dominated by blue oak and chaparral. Annual precipitation averages about ten inches, resulting in intermittent and ephemeral streams with sparsely vegetated riparian corridors.

The project site, known as the Diablo Grande Ranch, or Oak Flat Ranch, is used for seasonal cattle grazing. Approximately 1.5 acres of an irrigated vineyard has been recently established in the Oak Flat area near the stable. Several ranch structures (including residences) and an occupied mobile home are also located in Oak Flat. Two inholding properties, located within the Wilcox ridge area, are not part of the project but will be included in the EIR. These properties include the 575-acre Isom Ranch and a 32-acre property located to the west of Isom Ranch. Figure III.A-3 shows the existing conditions of the site.

Primary access to the site is via Oak Flat Road approximately three miles south of Patterson. Access to Oak Flat Road is provided via the Sperry Road interchange and Ward Road. Oak Flat Road is a County-maintained two-lane road. The Oak Flat Road corridor, approximately 4.5 miles long, is included as part of the project site. Most of Oak Flat Road is upaved, except for a short segment accessing a cherry orchard at its lower end near Interstate 5 (I-5). Access within the Ranch is also available via a number of unimproved private ranch roads, including a private dirt road from Del Puerto Canyon Road approximately four miles north of Oak Flat Road.

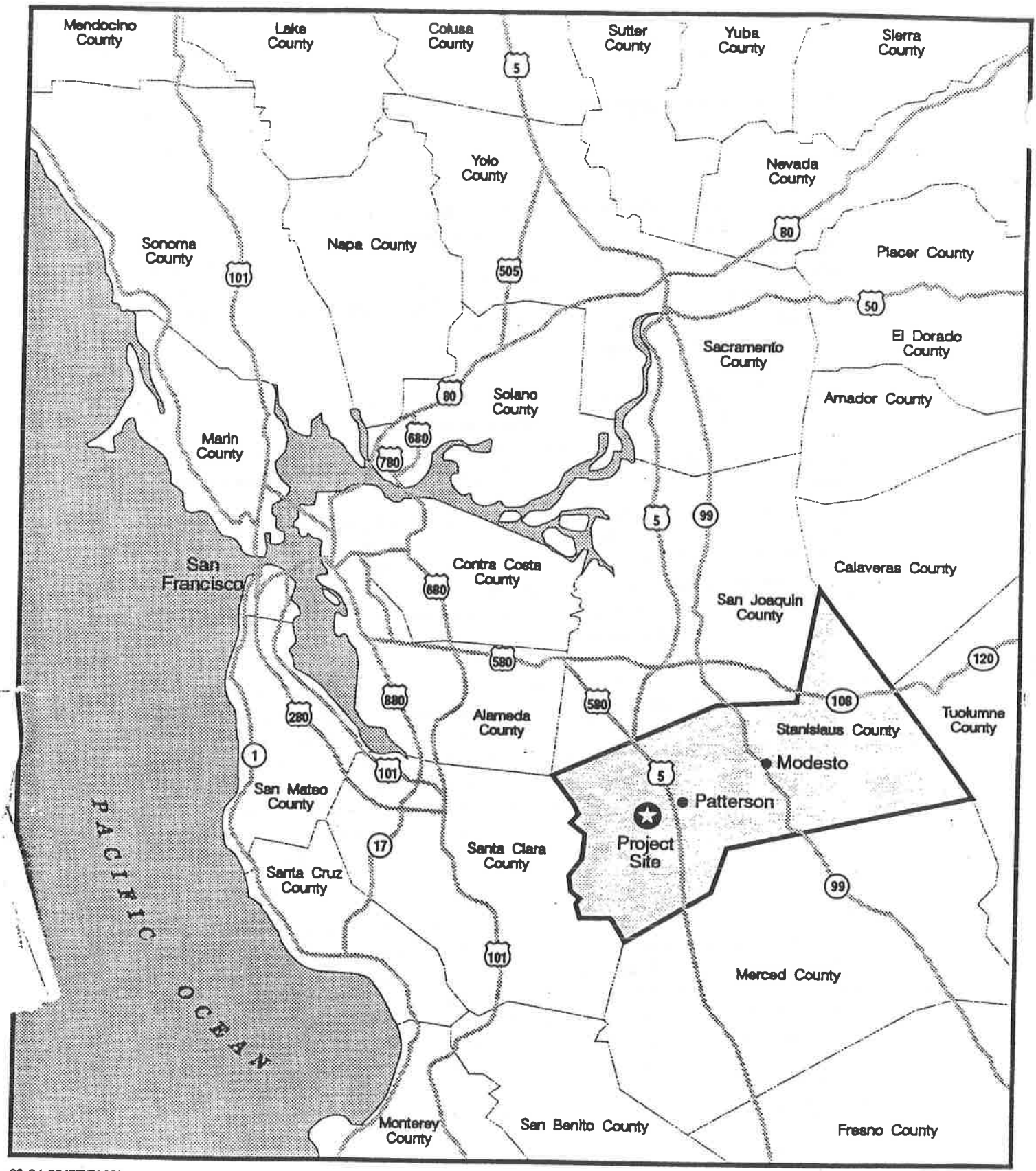

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Figure III.A-1

LSA

Scale in miles

0 15

Regional Location

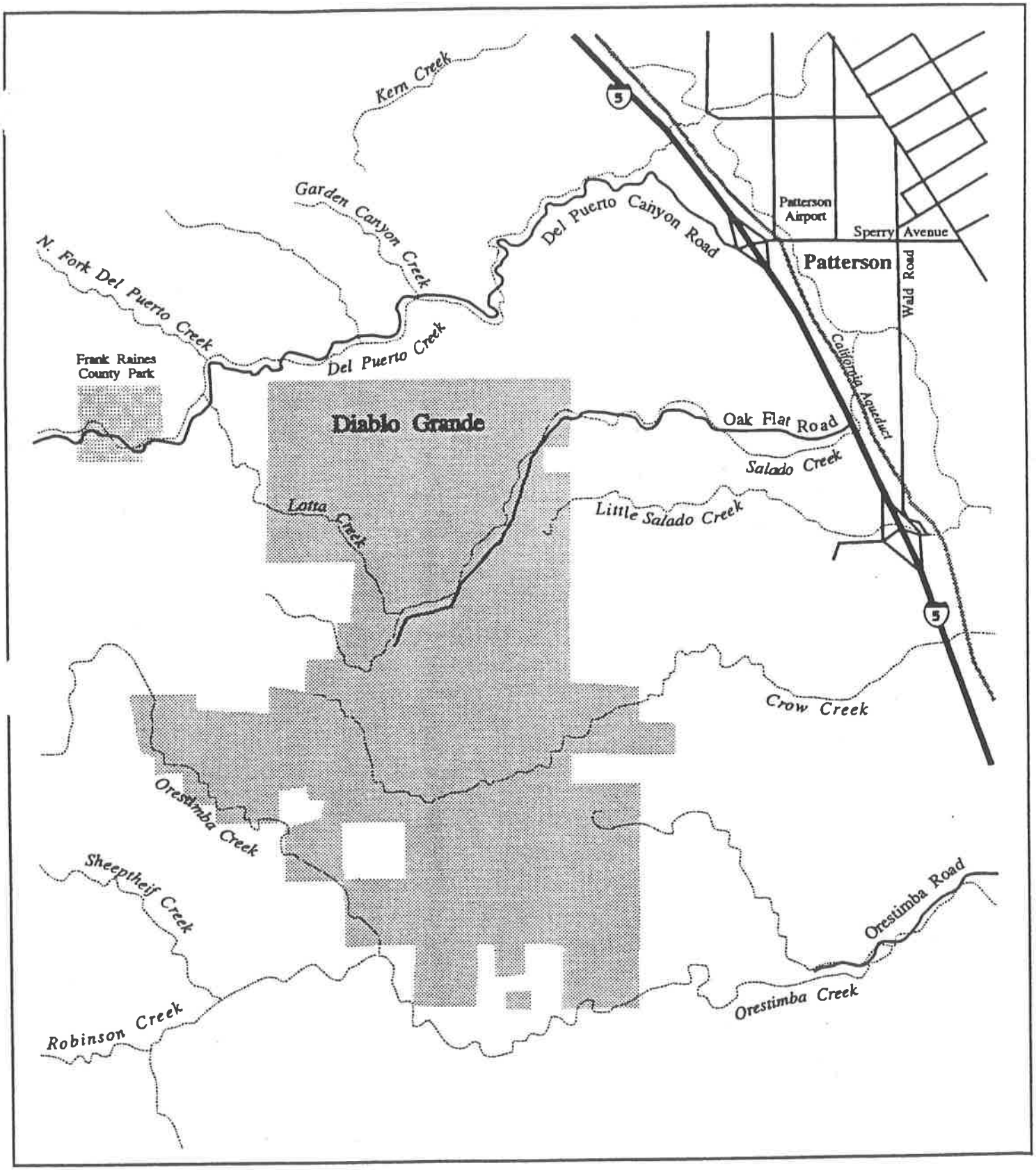

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Figure III.A-2

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Scale in miles

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Project Site

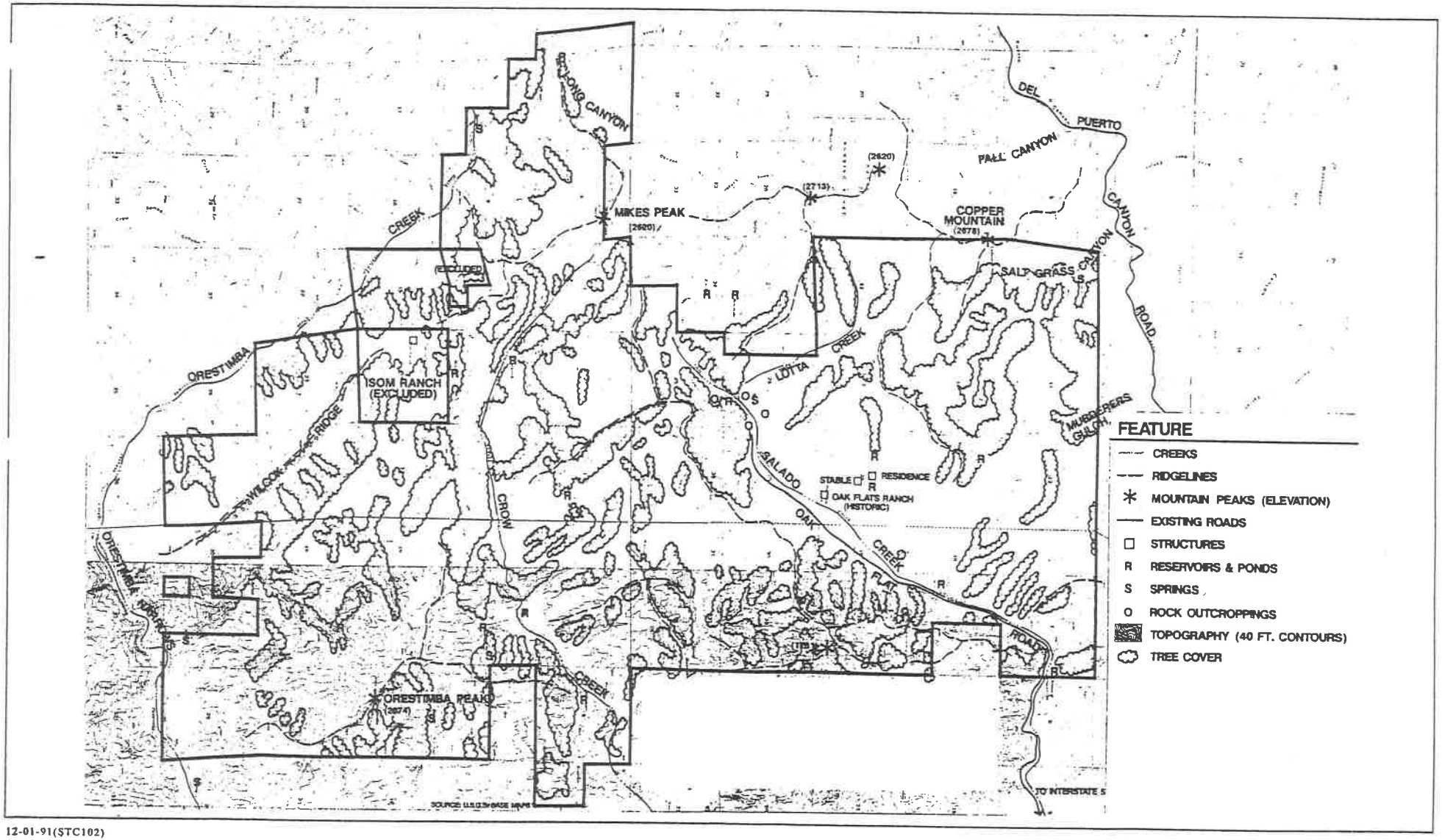

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Figure III.A-3

N

LSA

Scale in Feet

0 3000 6000

Existing Conditions

B. CHARACTER OF SURROUNDING AREA

The project vicinity is similar in character to the project site. It is a rural area characterized by rangeland, steep ridges, dry climate, and sparse vegetation. The primary land use in the area is large ranches, with a few ranch complexes located in the larger valleys.

The area is sparsely populated and is not intensely developed. A master-planned community, Lakeborough, is proposed for development on the more gently sloping orchard and rangeland a few miles to the east of the site, adjacent to I-5.

C. PROJECT SPONSOR'S OBJECTIVE

The primary goal of the project sponsor, Diablo Grande Limited Partnership, is "to create a pace-setting destination resort and residential community providing quality of life balanced between residential living, employment and leisure time activities, all contained within a comprehensive open space system." (Diablo Grande, Inc., 1990). The applicant's objective is for "Diablo Grande to be a world-class Destination Resort environment that will serve local, regional and international business persons, tourists and residents in a contemporary setting while preserving and enhancing the pristine natural features of the historic ranch including major peaks and ridgelines, creekways, tree cover and wilderness areas" (Normoyle & Newman, 1990).

D. TECHNICAL PROJECT DESCRIPTION

Introduction

The proposed project is an amendment to the Stanislaus County General Plan and rezoning to permit development of a planned destination resort and residential community on the site. In addition, the project includes a Phase 1 Preliminary Development Plan for 2,000 acres of the site centered around Oak Flat.

The following project description was summarized from the Draft Specific Plan prepared by Diablo Grande, Inc. in April 1992. The Draft Specific Plan is available for public review at the Stanislaus County Planning Department.

Description

The entire 29,500-acre project site is proposed for a General Plan designation of "Specific Plan". In addition, all property within the site is proposed to have underlying or combining General Plan designations contained in the Stanislaus County General Plan (Table III.D-A). The site is currently designated Agriculture in the County's General Plan. Zoning on the site is

proposed to be changed from A-2-160, General Agriculture District, with two dwellings allowed for every 160 acres, to S-P, "Specific Plan," pursuant to Chapter 21.38 of the Stanislaus County Zoning Ordinance. The project would have underlying or combined zone classifications based on districts contained in the Stanislaus County Zoning Ordinance as modified by the Specific Plan (Table III.D-B).

Under the General Plan amendment and rezoning, development of five "villages" is proposed including recreational, residential, open space, resort, office, commercial, agricultural, and other land uses. Figure III.D-1 is the proposed land use plan. Additional development would occur within the Entry Area between the proposed Village 1 and the eastern boundary of the Diablo Grande Project site. The proposed land uses are summarized in Table III.D-C.

Land Uses Within Villages

Village 1 - Oak Flat

This village would encompass approximately 3,400 acres on both sides of Oak Flat Road near the northern entrance to the site. It is generally bound by a 1400- to 1600-foot msl ridgeline extending southeasterly along the south side of Salado Creek, rock outcroppings at the west end of the valley floor, steep slopes extending southeasterly from Copper Mountain, and the main pond at the entrance to the valley on Oak Flat Road. Village 1 has the most gentle terrain of the five villages. Approximately 2,200 housing units (primarily low-density, and some medium and high density) would be developed on about 1,380 acres of this village. In addition, this village would include 51 acres of "employment" uses including a 13-acre hotel/resort area; an 11-acre town center; a 9-acre shopping center; and 1,790 acres of open space, which includes 330 acres of golf courses, 84 acres of parks and recreation facilities, 40 acres each of vineyards and creekside open space, and 1,309 acres of "hill areas." The 21-acre polo center proposed as part of Village 1 is proposed to be replaced with 55 single-family residences near the completion of the village, and possibly relocated as an equestrian center in later phases of development. The "hill area" would primarily be open space except for a total of up to 100 three- to 40-acre estate lots, which would be permitted in these areas of the five villages. The village also would include approximately 172 acres of major roadways.

Table III.D-A - Proposed Underlying Zoning Ordinance Designations

Village	District*
1-Oak Flat	Low Density Residential (.2-.9 du/ac) Medium Density Residential (7 du/ac) Medium High Density Residential (15 du/ac) Commercial Planned Industrial (R&D)
2-Copper Mountain	Low Density Residential (.2-.9 du/ac)
3-Indian Rocks	Low Density Residential (.2-.9 du/ac)
4-Crow Creek	Low Density Residential (.2-.9 du/ac) Medium Density Residential (7 du/ac) Medium High Density Residential (15 du/ac) Commercial
5-Orestimba	Low Density Residential (.2-.9 du/ac) Medium Density Residential (7 du/ac) Medium High Density Residential (15 du/ac) Commercial
Entry Area	**District**
	Medium High Density Residential (15 du/ac) Planned Industry (Research Campus)
Conservation Areas	**District**
Salado	Agriculture, Estate Residential (3-40 du/ac)
Copper Mountain	Agriculture, Estate Residential (3-40 du/ac)
Wilcox Ridge	Agriculture, Estate Residential (3-40 du/ac)

Notes:

Average du/ac (dwelling units per acre) for low density residential areas will probably increase with the range as preliminary development plans are prepared for each village and open space land increases.

Up to 100 estate lots would be allowed within the project's Conservation Areas.

Table III.D-B - Proposed Underlying Zoning Ordinance Designations

Village	District*
1-Oak Flat	SFR (R-1) MDR (R-2) MFR (R-3) NC (C-1) Planned Development (PD) (for Resort Center)
2-Copper Mountain	Single Family Residential (R-1)
3-Indian Rocks	Single Family Residential (R-1)
4-Crow Creek	Single Family Residential (R-1) Medium Density Residential (R-2) Multiple Family Residential (R-3) Neighborhood Commercial (C-1)
5-Orestimba	SFR (R-1) MDR (R-2) MFR (R-3) NC (C-1)

Entry Area	District
	MFR (R-3)
	PD (for Research Campus)

Conservation Areas	District
Salado	General Agriculture (A-2) **
Copper Mountain	General Agriculture (A-2) **
Wilcox Ridge	General Agriculture (A-2) **
Orestimba	General Agriculture (A-2) **

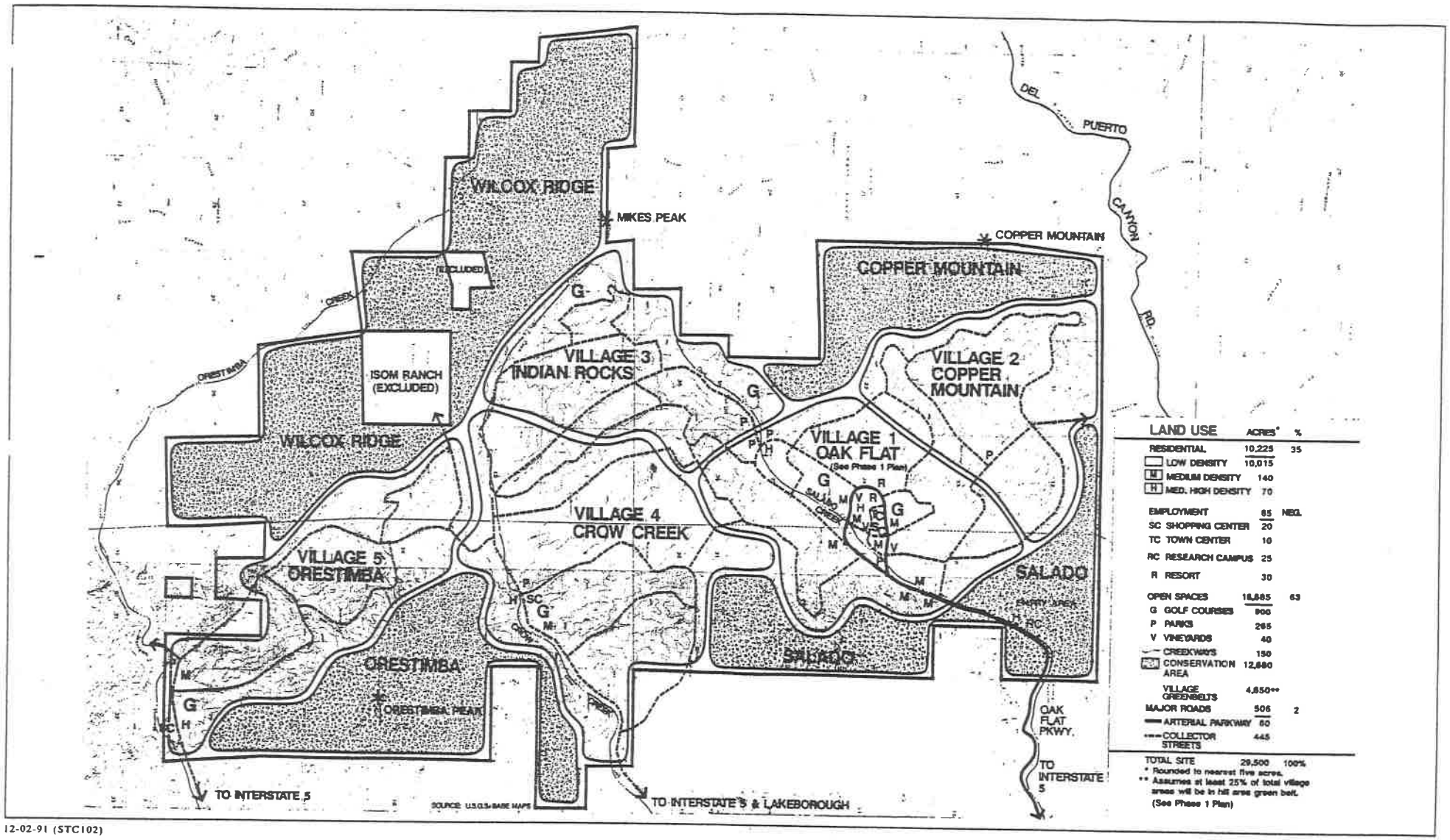
* Exceptions to District Regulations include the following (among others):

(R-A) Preliminary golf course development plans must be reviewed by the Planning Commission and Board of Supervisors, with final Development Plans reviewed by the Planning Director and Public Works Director prior to issuance of a building permit.

(R1) Mobile homes and duplexes are not permitted.

(R-C) Hotel may be up to 55 feet in height. Mixed use and shared parking may be accepted by the Planning Director as part of the County Site Plan and Design Review of the project.

** The limited large estate lots allowed in the Conservation Areas would be subject to the applicable R-A District standards.



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LSA

Scale in Feet
0 3000 6000

Figure III.D-1

Land Use Plan

Table III.D-C - Summary of Land Uses Within Villages

Land Use	Average DU'S/AC	Village 1-Oak Flat			Village 2 - Copper Mountain			Village 3 - Indian Rocks			Village 4 - Crow Creek			Village 5 - Orestimba			Total		
		Acres	%	Units[1]	Acres	%	Units	Acres	%	Units	Acres	%	Units	Acres	%	Units	Acres	%	Units[2]
Residential		1,383	41	2,200	1,950	70	400	1,586	57	400	3,100	68	1,100	2,205	69	900	10,224	61	5,000
Low Density	.2-.9[3]	1,270		1,150	1,950		400	1,586		400	3,050		570	2,160		420	10,016		2,940
Medium-Density	7	85		630							28		200	25		180	138		1,010
Medium-High Density	15	28		420							22		330	20		300	70		1,050
Employment[4]		51	2					4	neg.		5	neg.		4	neg.		64	neg.	
Town Center		11															11		
Shopping Center		9									3			2			14		
Resort		23						4			2			2			31		
Public Services		8															8		
Open Space		1,794	52		760	27		1,130	40		1,390	30		930	29		6,004	36	
Golf Course		330						320			160			90			900		
Parks		84			60			80			20			20			264		
Vineyards		41															41		
Creekways		40						30			60			20			150		
Hill Areas[5]		1,299			700			700			1,150			800			4,649		

Land Use	Average DU'S/AC	Village 1-Oak Flat			Village 2 - Copper Mountain			Village 3 - Indian Rocks			Village 4 - Crow Creek			Village 5 - Orestimba			Total		
		Acres	%	Units[1]	Acres	%	Units	Acres	%	Units	Acres	%	Units	Acres	%	Units	Acres	%	Units[2]
Major Roads		172	5		90	3		80	3		105	2		61	2		508	3	
• Arterial		62															62		
Parkway																			
• Collectors		110			90			80			105			61			446		
Total Conservation Areas and Estate Lots																	12,700		
Total Project Acreage																	29,500		
Total Villages		3,400	100%	2,200	2,800	100%	400	2,800	100%	400	4,600	100%	1,100	3,200	100%	900	16,800	100%	5,000

Proposed residential uses under Village 1 includes those proposed within the Entry Area between Village 1 and the eastern property boundary along Oak Flat Parkway.

Up to 100 of these residential units will be located on estate lots ranging from three to 40 acres within the Conservation Areas abutting the five villages.

According to Diablo Grande, Inc., the average dwelling units/acre for low density areas will probably increase as Preliminary Development Plans are prepared for each village and open space land increases.

An additional approximately 26 acres of employment generating land proposed for Research Campus would be located within the Entry Area, east of Village 1 (see Figure III.D-4, Entry Area Plan).

Assumes a minimum of 25% hill area greenbelts in each village. Actual percentage will probably increase as Preliminary Development Plans are prepared for each Village. For example, the Phase 1 Preliminary Development Plan, covering a majority of Village 1, includes 38% hill area open space.

Village 2 - Copper Mountain

Village 2 would encompass about 2,800 acres in the foothills of Copper Mountain. It is generally bounded by Village 1 below and to the southeast, Copper Mountain to the west, the site's northernmost property line to the north, and by a lesser ridgeline running northeasterly to the northern entry to Village 1. Village 2 would include 400 low density residential units on 1,950 acres, 760 acres of open space (including 700 acres of hill area and 60 acres of parks), and 90 acres of major roads.

Village 3 - Indian Rocks

This village would consist of approximately 2,800 acres and is generally bounded by many rock outcroppings to the southeast, a lesser ridge to the east, Crow Creek below Wilcox Ridge to the west, and by the site's property lines at the base of Mike's Peak to the north. This village would include 400 low-density residential units on 1,586 acres, four acres of resort employment, 1,130 acres of open space (including 700 acres of "hill areas", 320 acres of golf courses, 80 acres of parks, and 30 acres of creekways). It also would include 80 acres of major roadways.

Village 4 - Crow Creek

This village would include 4,600 acres bounded on the west and north by ridgelines separating it from Villages 1 and 3. Its primary southern boundary is the foothills of Orestimba Peak above Crow Creek. The easternmost boundary is the property line as it is entered from Crow Creek. This village would include 1,100 units (570 low-density, 200 medium-density, and 330 medium-high density units) on 3,100 acres. It also would include three acres of shopping and two acres of resort commercial. A total of 1,390 acres would be open space, including 1,150 acres of hill areas, 160 acres of golf course, 60 acres of creekways, and 20 acres of parks. Roadways would cover 105 acres of this village.

Village 5 - Orestimba

Village 5 would include 3,200 acres of rugged terrain with a valley to the south at Orestimba Creek. It is bounded by the site's property lines and Wilcox Ridge to the west, Village 4 and a lesser ridge above Crow Creek to the north, and the foothills of Orestimba Peak to the east. This village would contain 900 residential units on 2,205 acres, including 420 low-density units, 180 medium-density units, and 300 medium-high density units. It also would contain two acres each of resort and shopping center uses. Nine hundred thirty acres of open space, primarily hill area (800 acres) and golf course (90 acres), and 60 acres of roadways would be included.

Other Development Areas

As stated in the Draft Specific Plan, up to 100 residential units would be permitted within the Conservation Areas abutting the five villages. These units would be located on estate lots ranging from three to 40 acres in size.

Proposed land uses within the Entry Area include approximately 35 units for service employees, 26 acres of research campus, a seven-acre sewage treatment plant, an 11-acre plant nursery, 50 acres of creekside area, and 204 acres of hillside Conservation Area.

Up to 15 percent transfer of residential density between each village is proposed. This would permit an increase or decrease in residential density in each village, but would not change the total units permissible for the project. Based on the 15 percent density transfer, the number of units within each village range as follows: Village 1, 1,870 to 2,530 units; Village 2, 340 to 460 units; Village 3, 340 to 460 units; Village 4, 935 to 1,265 units; and Village 5, 765 to 1,035 units. The above totals do not include the 35 units for service employees, or the 100 hillside estate lots which would be constructed through such a transfer of residential densities. The total number of units within the project site would not exceed 5,000.

Description of Land Use Types

Residential Uses

Low-density residential uses would consist of single-family detached dwellings on lot sizes ranging from 10,000-, 20,000-, and 40,000-square-foot minimum lots to large three- to 40-acre estate lots (mostly sewered, some remote lots on septic tanks). The average density of detached single-family units would range from 0.3 to 0.9 dwelling units per acre. Prices in this category are expected to range from $300,000 to over $1,000,000 (1992 dollars). The average density in this category is about 0.5 dwelling units per gross residential acre (minor streets included). Approximately 2,940 dwelling units are proposed in this category.

The medium-density residential category would consist primarily of attached single-family dwellings in groups of two to five units. These would be mixed in combinations of one-story patio houses and two-story townhouses or duets. The minimum lot size for duets would be 4,000 square feet and would vary for patio and townhouses, which would include common open space and private drives that would be maintained by a Homeowners' Association (HOA). The average density of the attached single-family dwellings would be seven dwelling units per net residential acre (excluding streets). The price range for these dwelling units is expected to be $170,000 to $300,000 (1992 dollars). Detached single family "0-side yard" or "z-lot"

homes in this category might range from $240,000 to $300,000. Approximately 1,010 dwelling units are proposed in this density category.

Medium-high density residential uses would include clusters of multiple family and/or condominium units at an average density of 15 dwelling units per net acre (excluding streets). If sold as condominiums, these units are expected to range from $150,000 to $250,000 (1992 dollars). About 1,050 dwelling units are proposed in this category.

It is estimated by the applicant that the total population of the project at design capacity would be about 11,920. In addition to normal vacancy rates, a resort and residential community of this type can also expect seasonal use of the dwelling units due to such uses as second homes, rentals for vacationers, and part-time corporate housing use. It is estimated by the applicant that up to 14 percent of the total number of dwellings would fall into those categories. A seasonal population of about 1,500 people is anticipated.

Employment Uses

Employment-generating land uses are included in four general categories including: shopping centers, the town center, the research campus, and resort uses. A total of 90 acres of employment land uses are proposed. Assuming an average of 17 jobs per acre of employment-generating land uses, the project would generate about 1,530 jobs. In addition, public service land uses outside of Phase 1 may generate 70 jobs. Based on traffic studies, it is estimated that up to 370 workers may work at home. This would result in total employment opportunities of up to 1,970 jobs.

Approximately 14 acres of shopping center land uses are proposed, including a nine-acre community center in Village 1, a three-acre convenience center in Village 4, and a two-acre convenience center in Village 5.

Proposed Town Center uses consist of an 11-acre Town Center site, a four-acre maintenance site, and a four-acre water treatment plant site in Village 1. The Town Center would be centrally located in Village 1, between the resort hotel and executive conference center and community shopping center. Vineyards on abutting knolls would be planted on both sides of the Town Center. About half of the 11-acre town center site would be specialty shops, restaurants, and resort-oriented land uses. The other half would be used for Diablo Grande administrative offices, other administrative and professional offices, and County governmental facilities such as a Sheriff's station, fire station, emergency care, and health facilities.

The largest employment area is within the vicinity of Village 1. Development of Village 1 could generate approximately 870 jobs with its Town Center, shopping center, resort, and public services. The proposed research campus

within the Entry Area would provide an additional 440 professional and technical jobs.

Resort Uses

Most of the 31 acres of proposed resort facilities would be located in Village 1 near the proposed town center, including the resort hotel and executive conference center, the golf clubhouse for the Oak Flat Golf Course and the Salado Creek Golf Course, European spa, a swim and tennis club, the Diablo Grande Winery, and several restaurants. The golf clubhouse would be converted from the existing 12,000-square-foot ranch house. Outside of Village 1, four golf courses are proposed, including two 18-hole courses in Village 3, one 18-hole course in Village 4, and a nine-hole course in Village 5 that may be expanded if additional flat lands are eventually acquired.

The resort hotel and its executive conference center would be located on 13 acres in Village 1. The resort hotel would provide 220 to 250 rooms, a restaurant, a coffee shop, a lounge, meeting rooms, swim complex, and cabana.

The existing 10,000-square-foot stable adjacent to the existing ranch house is being studied for conversion to a European spa, and swim and tennis club (11 tennis courts). The spa would provide health and exercise facilities, and may alternatively be located in the resort hotel.

Approximately 41 acres of vineyards are proposed on knolls on both sides of the town center in Village 1. A test vineyard of one and one-half acres is in operation to help determine water and soil suitability for a variety of grapes. The Diablo Grande Winery, which would provide about 20,000 cases of wine per year from the vineyards on site, is proposed across Oak Flat Parkway from the resort hotel and town center. The winery would provide specialty shop and restaurant uses, and would host community music, art, and recreation events.

In addition to the Diablo Grande Winery restaurant and the resort hotel restaurant, two restaurant locations are proposed in proximity to the resort center. One is proposed on a knoll overlooking the 12th hole of the Oak Flat Golf Course, and the other along Salado Creek abutting proposed vineyards.

Open Space/Recreational Uses

At least 60 percent of the project site would be in open space land uses, including six golf courses, six parks, a staging area, vineyards, creekway conservation areas, Conservation Areas, and hill area greenbelts in each village.

Approximately 264 acres of parks and recreation areas are proposed in the five villages. They range in function from active recreation at the community park in Village 1 to passive creekside and hillside parks (Table III.D-D). Parks for prehistoric and historic preservation are proposed, as are special use facilities such as the polo center abutting the Oak Flats Ranch Historic Park. It is proposed that all park areas would be owned and maintained by the Diablo Grande Community Service District.

Most of the major creekway corridors would be preserved and enhanced, including Salado Creek, Lotta Creek, Crow Creek, and Orestimba Creek. The introduction of ponds and recycling of water is proposed to enhance existing riparian corridors. The majority of existing trees, especially oak trees, would be preserved along creekways. Where tree removal along creekways would be needed for road extensions and culvert crossings, a tree replacement and/or relocation plan would be provided.

The proposed Open Space Plan includes four Conservation Areas totaling 12,700 acres (43 percent of the project site) and five categories of open space features totaling approximately 6,000 acres (20 percent of the project site). The up to 100 permitted estate lot developments within these Conservation Areas would be subject to review by the Diablo Grande Environmental Control Committee (DGECC) at the design review stage.

It is estimated that at least 28 percent, or 4,649 acres, of the five village areas would have hillside open space areas that would be greenbelts for trail use, tree preservation, preservation of steep slopes, and avoidance of landslides on those steep slopes.

Grading Plan

The project would permit grading of up to 45 percent of the site. The applicant's preliminary calculations indicate that approximately 20 percent of the total site would be graded. Grading would be necessary to construct the roadway system, extend utilities and to provide functional areas for residential, resort, and recreational development. The Draft Specific Plan provides grading objectives and policies to be incorporated into the project to minimize grading impacts. Such measures include the minimization of tree removal, the contouring of graded slopes to blend with existing contours, the use of minimum residential building pads and/or split level grading, and the balancing of grading on-site within each phase.

Table III.D-D - Proposed Park and Recreation Areas

Village No.	Name	Facilities
1	Community Park	Baseball and soccer fields
	Oak Flats Ranch Park	Historic preservation, picnicking, trails
	Polo Center	Riding arena, polo field
	Indian Rocks Park	Prehistoric preservation, picnicking, trails
2	Copper Mountain	Passive recreation
3	Indian Rocks Park	Prehistoric preservation, picnicking, trails
4	Crow Creek	Creekside park, passive recreation
5	Orestimba	Creekside park, passive recreation

Drainage Plan

The drainage plan objective, as outlined in the Draft Specific Plan, is to protect the safety and general welfare of the project site as well as downstream properties through provision of a comprehensive drainage system consisting of surface storage ponds, reservoirs, and a conventional stormdrain system. The major creeks are to be preserved. Some smaller tributaries would be underground. Conventional stormwater systems are to be designed for each phase of development and a Drainage Plan is to be submitted prior to the approval of each Final Map. Preliminary Drainage Plans may be required by the County Public Works Department prior to approval of the tentative map.

Public Facilities Plan

The project proposes many on-site public facilities, the majority of which would be within Village 1. As shown on the Public Facilities Plan (Figure III.D-2), a fire station, sheriff's station and ambulance station are proposed within the town center. North of the town center would be the maintenance center for the project site. A helistop would also be located within the town center. The helistop would be primarily for emergency medical use. The applicant also may request use of this heliport for business purposes; additional environmental review and permits may be required for that use, depending on the intensity of flights proposed.

Several parks are planned throughout the project site, along the major creeks and within the residential areas.

Although project students are expected to attend off-site schools, an elementary school site would be designated outside of Phase I in the Draft Specific Plan if it is determined to be needed in buildout conditions.

The proposed project requires the extension of all major utilities throughout the site.

Water System

The proposed long-term source of water would be from a surface water supply from off-site sources via the California Aqueduct (see Public Services: Water subsection of this EIR for a more detailed discussion of the proposed water supply system). Until arrangements for water from these sources are made, interim supplies would be obtained from groundwater underlying property along Marshall Road (located approximately three miles east of the Salado Creek/I-5 intersection) for which an option to purchase water has been secured by the applicant. A well head booster pumping plant and approximately three miles of pipeline to a connection with a permanent

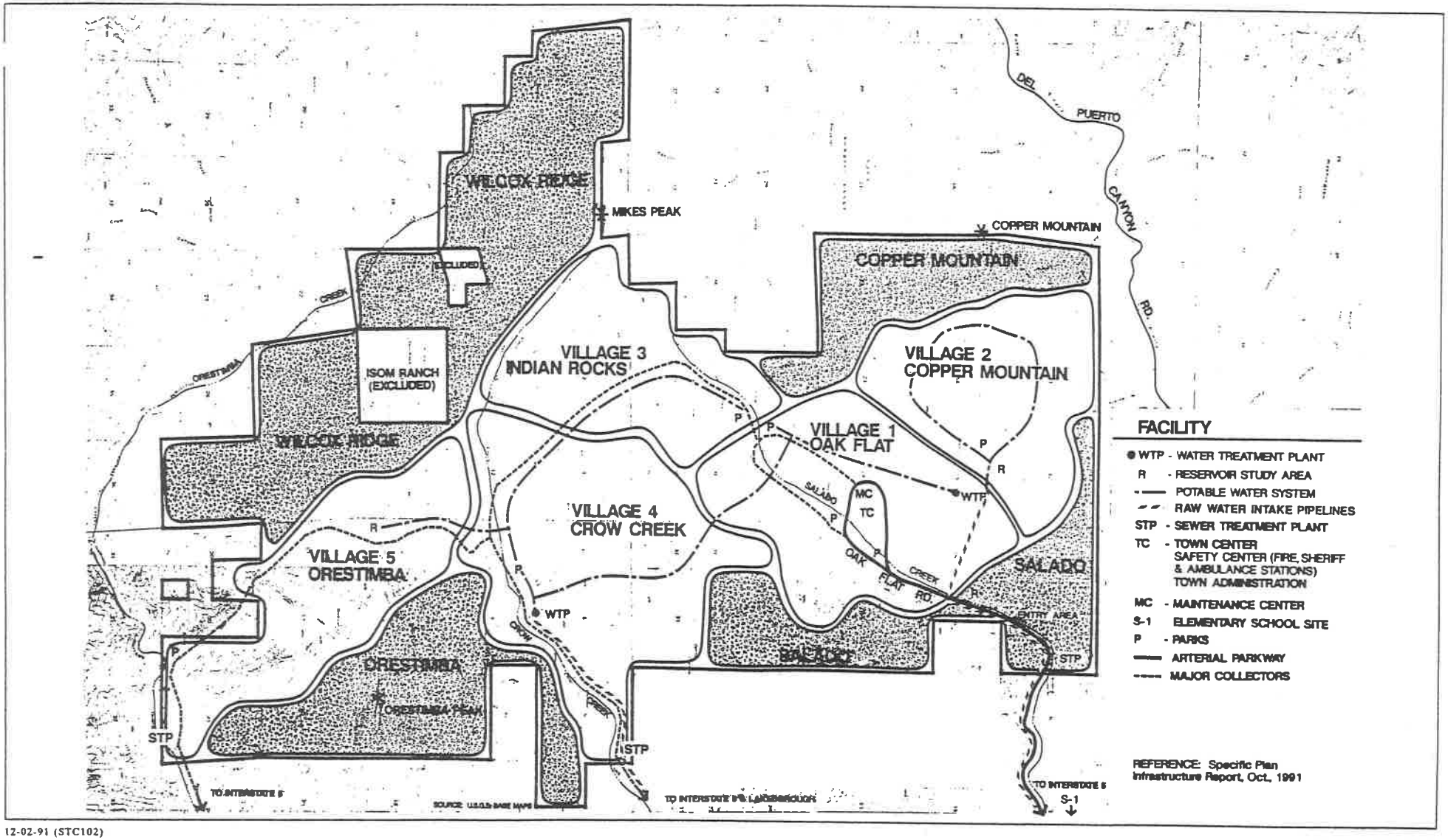

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Figure III.D-2

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Scale in Feet
0 3000 6000

Public Facilities Plan

pipeline from the Aqueduct would be needed. The well also would be used in emergencies when water from the Aqueduct is not available.

Water would be diverted from the Aqueduct at two locations. Pumping facilities on the Aqueduct, in-line booster pumps, and pressure pipelines would convey the water to Diablo Grande. One pipeline would generally follow the alignment of Oak Flat Road (and Salado Creek) and is referred to as the Salado Creek Intake. A second pipeline would generally follow the alignment of Crow Creek and is referred to as the Crow Creek Intake. The intake pipelines would terminate at storage and water treatment facilities that will serve Diablo Grande. The Salado Creek Intake and Salado Creek Filtration Plant would serve Phases 1 and 2. The Crow Creek Intake and the Crow Creek Filtration Plant would serve Phases 3 and 4 and a portion of Phase 2.

Wastewater System

Wastewater collection systems would be constructed to serve each village, conveying wastewater to one of three sewerage treatment plants. One plant (located within the Entry Area) would serve Phase 1 and portions of Phase 2, and will discharge to Salado Creek. A second plant would serve a portion of Phase 2 and Phase 3, and discharge to Crow Creek. The third plant would serve Phase 4 and discharge to Orestimba Creek. Each plant would have the capability to treat wastewater to the degree necessary to use the effluent for irrigation.

Circulation Plan

The proposed Circulation Plan is a network composed of an arterial parkway, major collectors, minor collectors, cul-de-sacs, a major trail system and other facilities (see Figure III.D-3 Circulation Plan). The Oak Flat Parkway is proposed to serve as the primary access road to the project from Interstate 5 near Del Puerto Canyon Road (see Figure III.D-4 Proposed Entry Road System). A proposed access road from Interstate 5 to the Oak Flat Parkway was added to the project as a result of traffic analysis. Oak Flat Parkway would be a two- to four-lane roadway with capacities of 12,000 to 25,000 vehicles per day.

The existing Oak Flat Road would serve as the secondary access road to the project site. Access to the Lakeborough community east of the project site would be provided by a future access road off Oak Flat Road.

The three major collector streets proposed for the project are Salado Creek Circle, Crow Creek Road, and Orestimba Road. These would be two-lane roads accommodating up to 12,000 vehicles per day. Salado Creek Circle would provide circulation around Village 1, linking it with the other villages and Oak Flat Parkway. Crow Creek Road would link Villages 3, 4, and 5 to

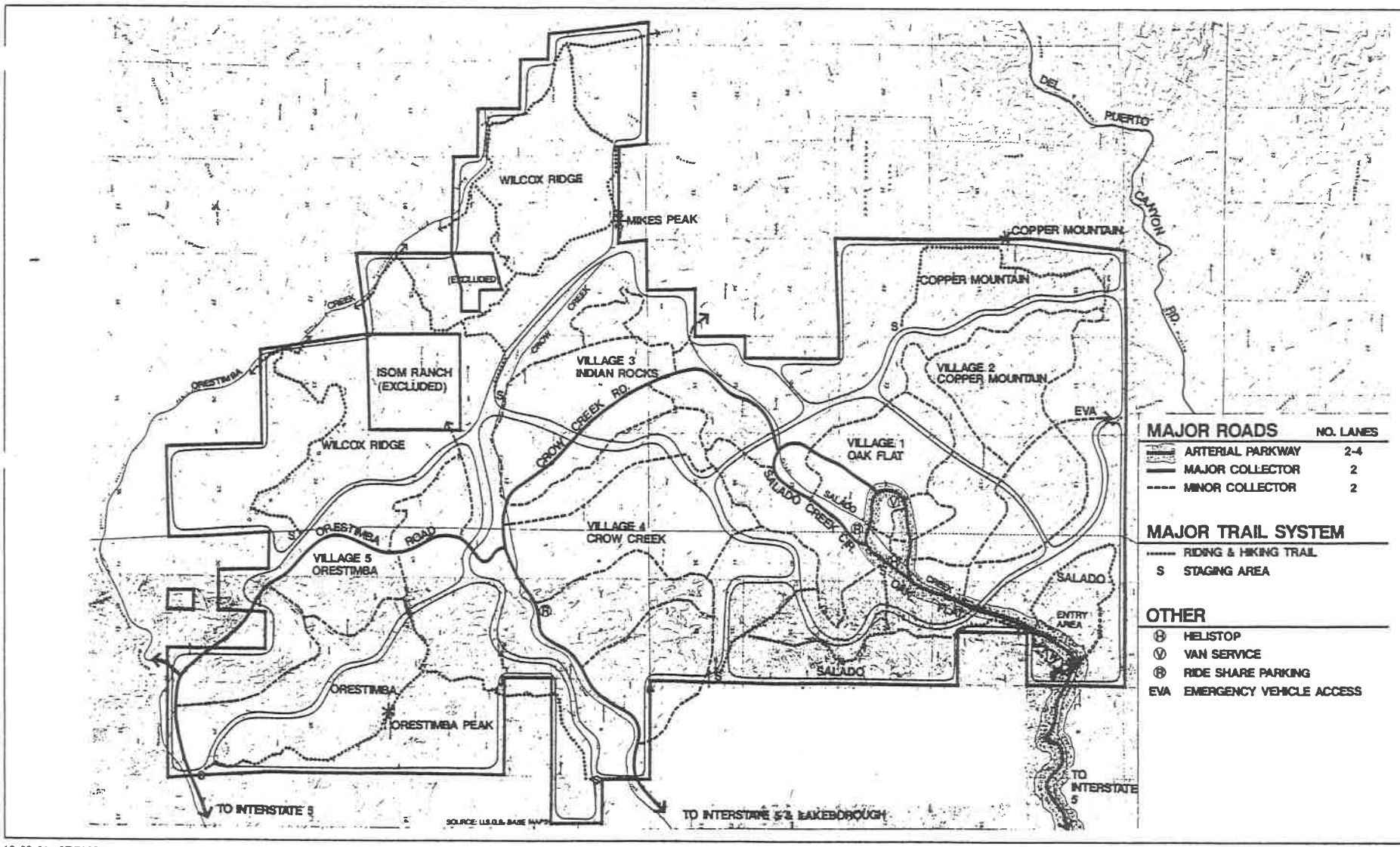

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Figure III .D-

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Circulation Plan

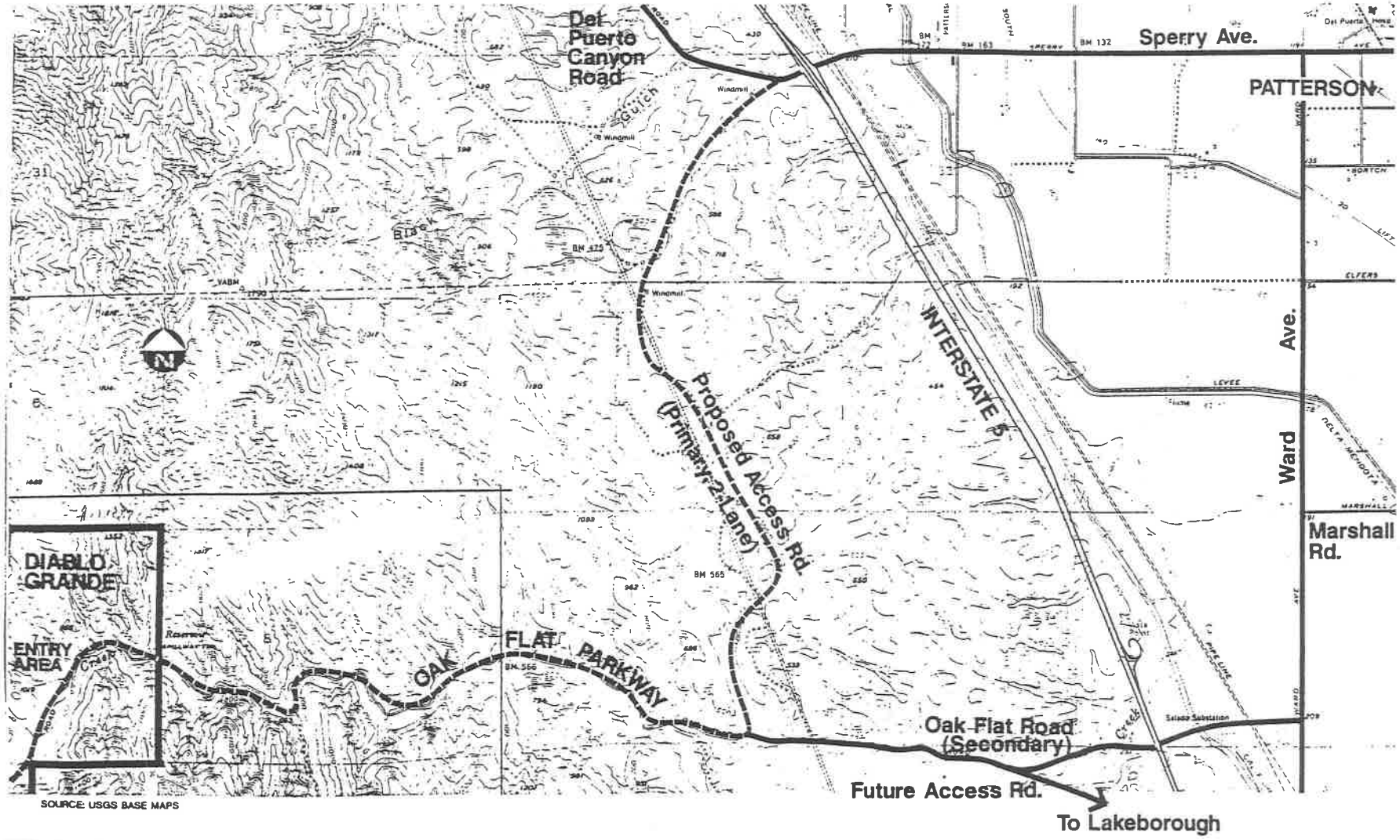

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Figure III.D-4

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Proposed Entry Road System

Village 1 at Salado Creek Circle, and eventually connect with Lakeborough and Interstate 5. Orestimba Road would link Village 4 to the north and Interstate 5 to the east.

Several minor collector streets are proposed in each of the five villages to serve as connectors between local and private streets, cul-de-sacs and the major collector systems. Except in the Phase 1 portion of Village 1, these have not been evaluated or located in detail. The minor collector streets may carry up to 10,000 vehicles per day in Village 1 but are expected to carry less than 3,000 vehicles per day in the other villages.

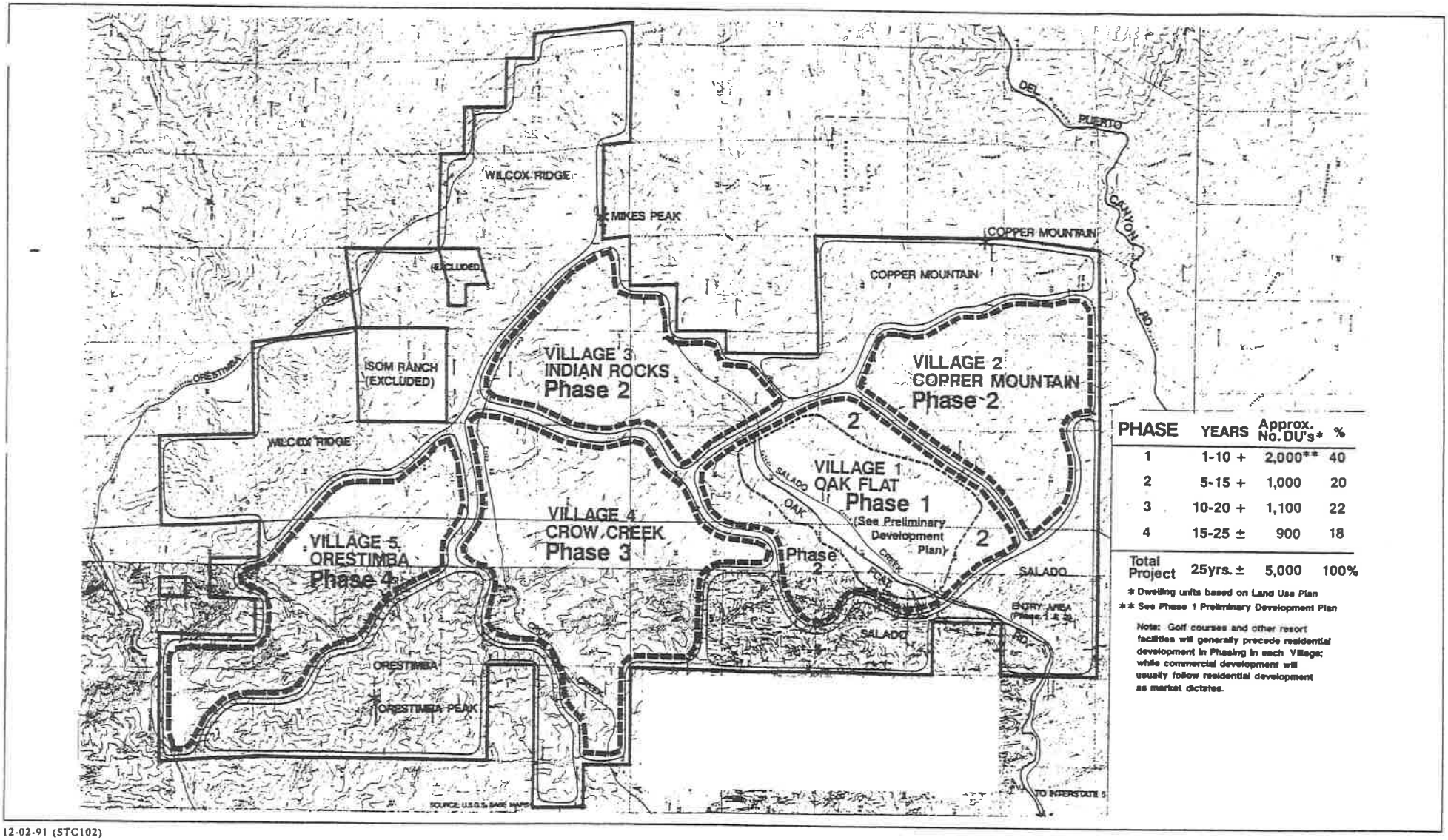
Public cul-de-sacs would primarily adhere to the County standard of maximum length of 500 feet. Some private cul-de-sacs of over 500 feet may be developed as part of the project. Cul-de-sacs would directly serve no more than 25 single family dwelling units unless emergency vehicle access is provided.

The trail system proposes peripheral trails and internal trails. Approximately 14 miles of peripheral riding and hiking trails are proposed primarily along the eastern portions of the project site in the Orestimba and Salado Conservation Areas. Approximately 18 miles of private riding and hiking trails are proposed to be used primarily by residents, guests and visitors. These internal trails would be located in the Copper Mountain and Wilcox Ridge Conservation Areas.

Van service, ride-share parking, and emergency vehicle access also would be included in the project. The resort hotel would provide van and limousine service. Ride-share parking lots would be provided in Villages 1 and 4. An emergency vehicle access would be provided to Del Puerto Canyon via Murderers Gulch or alternative routes to the northwest. The development of a helistop near the town center in Village 1 is also proposed.

Phasing

The project is proposed for development in four phases (see Figure III.D-5: Phasing Plan). Phase 1 would occur in the first ten years and would include most of Village 1, the primary and secondary access roads, and the construction of the sewerage treatment plant and plant nursery within the Entry Area. A portion of the Entry Area housing and research campus would also be developed. Forty percent of the total dwelling units proposed would be developed during Phase 1 (2,000 units). Phase 2 would occur in years five to 15, and would include the residential development of the hills on the edge of Village 1, and all of Villages 2 and 3. Approximately 20 percent of the total dwelling units proposed would be developed in Phase 2 (1,000 units). Phases 3 and 4 would be the development of Villages 4 and 5, respectively. Phase 3 would occur over years ten to 20. Approximately 1,100 dwelling units, or 22 percent of the total proposed would be developed during Phase 3. Phase 4 would occur in years 15 to 25 and beyond. During



PHASE	YEARS	Approx. No. DU's*	%
1	1-10 +	2,000**	40
2	5-15 +	1,000	20
3	10-20 +	1,100	22
4	15-25 ±	900	18
Total Project	25yrs. ±	5,000	100%

* Dwelling units based on Land Use Plan

** See Phase 1 Preliminary Development Plan

Note: Golf courses and other resort facilities will generally precede residential development in Phasing in each Village; while commercial development will usually follow residential development as market dictates.

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LSA Scale in Feet 0 3000 6000

Figure III.D-5

Phasing Plan

Phase 4 approximately 900 dwelling units, or 18 percent of the total proposed would be developed. A preliminary Development Plan has been prepared for Phase 1; generalized conceptual plans exist for later phases. Full buildout is projected to occur in about 25 years.

Phase 1

The Phase 1 Preliminary Development Plan applies to the development of most of Village 1, the Oak Flat Parkway entry roads, and portions of the entry area. It includes preliminary land use designations and road pattern, a preliminary golf course plan, detailed land use designations, proposed land use, circulation and open space locations and the proposed hill area open space system within Village 1 (see Figure III.D-6; Preliminary Phase 1 Development Plan). The proposed Phase 1 land uses are listed in Table III.D-E. The Entry Area Preliminary Development Plan is shown in Figure III.D-7.

E. PERMITTING, RESPONSIBLE AND REVIEW AGENCIES

Preliminary development plans would be submitted for each phase of development proposed on the Diablo Grande Draft Specific Plan for review by Stanislaus County staff, the Planning Commission and the Board of Supervisors. Once approved, the Preliminary Development Plan would be implemented either through submittal of a Tentative Subdivision Map (for residential projects) or a site plan (for individual non-residential projects) that would serve as a Final Development Plan.

The Stanislaus County Department of Planning and Community Development is the lead agency under CEQA for this EIR and will receive comments from reviewing agencies and the public on the Draft EIR and incorporate them into the Final EIR.

Numerous federal, state, regional and local agencies will review this document and use it in their planning and decision making. The following are governmental agencies which may or may not be permitting agencies, but which are, or may be responsible agencies under CEQA, advisory to one or more of the permitting agencies, or agencies which review and may comment on the EIR.

Federal Agencies

Federal Aviation Administration (Permitting)
Federal Highway Administration (Permitting - I-5 changes)
U.S. Environmental Protection Agency, Region 9 (Permitting)
U.S. Fish and Wildlife Service (Responsible - threatened species)
U.S. Department of Agriculture (Responsible)
U.S. Army Corps of Engineers (Permitting)

Land Use	Acres	%	Avg. Du/Ac	Estimated Units
Residential	683	34		1948
Single Family (SF)	570		1.7	950
Attached Single Family (ASF)	95		7	595
Multiple Family (MF)	18		15	420
Open Space & Recreation	1105	55		
Golf Courses & Club	330			
Swim & Tennis Center	4			
Polo Center	21			
Equestrian Staging Area	3			
Parks	78			
Vineyards	45			
Creek Conservation Area	40			
Hill Conservation Area	584			
Employment Areas	51	3	Avg. Emp.Ac 17	Estimated Employees 870
Shopping Center	9			
Town Center (Offices, Shops)	11			
Conference Hotel Center	13			
Health Spa	2			
Winery	3			
Golf & Tennis Clubs	2			
Restaurant	3			
Public Services (Administration, Water Treatment)	6			
Road System	166	8		
Parkway	67			
Collector Streets	79			
Cul de Sacs	31			
Total Phase 1	2000	100%		

N

LSA

Scale in Feet

0 600 1200

Figure III.D-6

Phase 1 Preliminary Development Plan

Table III.D-E - Phase 1 Proposed Land Uses

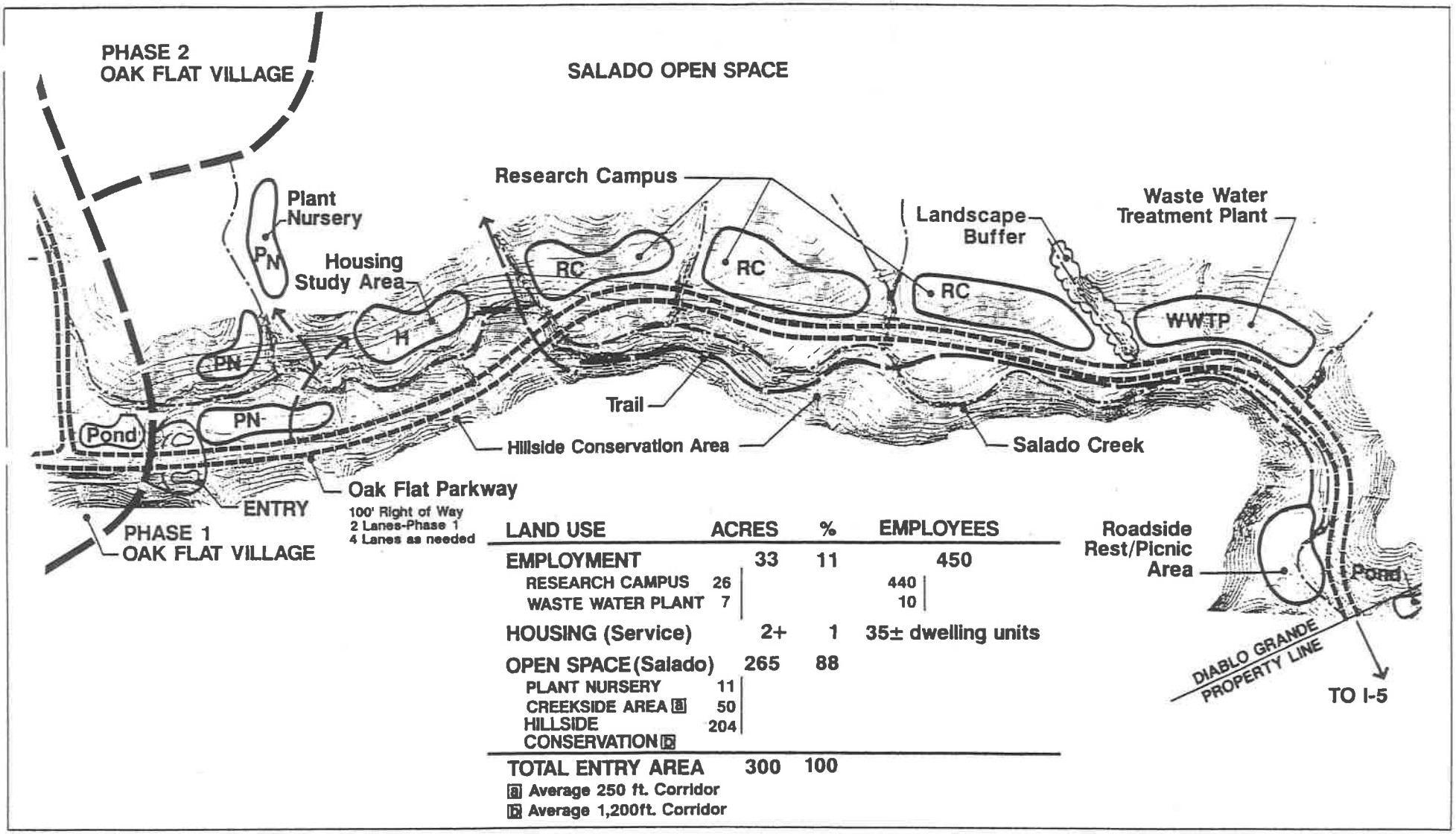
Land Use	Acres	%	Avg. Du/Ac.	Estimated Dwelling Units
Residential				
• Single Family (SF)	570		1.7	950
• Attached Single Family (ASF)	85		7	595
• Multiple Family (MF)	28		15	420
Subtotal	683	34		1,965[1]
Open Spaces & Recreation				
• Golf Courses & Club	330			
• Swim & Tennis Club	4			
• Polo Center	21			
• Equestrian Staging Area	2			
• Parks	78			
• Vineyards	41			
• Creek Area Preserve	40			
• Hill Area Preserve	584			
Subtotal	1,100	55		

Land Use	Acres	%	Avg. Emp./Ac	Estimated Employees
Employment Areas				
• Shopping Center	9			
• Town Center	11			
• Conference/Hotel Center	13			
• Winery	3			
• Golf & Tennis Clubs	2			

[1]An additional 55 single family (low density) dwelling units are proposed to be developed on the polo center site towards the end of Phase 1. This would yield a total of up to 2,020 units in the Phase 1 development.

Land Use	Acres	%	Avg. Emp./Ac	Estimated Employees
• Restaurant	3			
• Health Spa	2			
• Public Services (Maintenance & Water)	8			
Subtotal	51	3	17	870[1]
Road System				
• Parkway	62			
• Collector Streets	73			
• Cul de Sacs	31			
Subtotal	166	8		
TOTAL PHASE 1	2,000	100%		

[1]An additional 26 acres of land is set aside for potential Phase 1 employment (440 employees) east of Village 1 (see Entry Plan Research Campus).



LAND USE	ACRES	%	EMPLOYEES
EMPLOYMENT	33	11	450
RESEARCH CAMPUS 26			440
WASTE WATER PLANT 7			10
HOUSING (Service)	2+	1	35± dwelling units
OPEN SPACE (Salado)	265	88	
PLANT NURSERY 11			
CREEKSIDE AREA [a] 50			
HILLSIDE CONSERVATION [b] 204			
TOTAL ENTRY AREA	300	100	

[a] Average 250 ft. Corridor
[b] Average 1,200ft. Corridor

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LSA Scale in Feet 0 250 500

Figure III.D-7

Preliminary Entry Area Development Plan

State Agencies

California Governors Office of Planning and Research (Advisory)
California Department of Transportation (Permitting - I-5 changes)
California Department of Food and Agriculture (Responsible)
California Department of Fish and Game (Responsible - threatened species) (Permitting - Streambed alteration)
California Water Resources Control Board (Permitting)
California Regional Water Quality Control Board - Central Valley Region (Permitting)
California Public Utilities Commission
California Department of Conservation (Responsible)
California Air Resources Board (Responsible)
California Department of Health Services (Responsible)
California Waste Management Board (Responsible)
California Native American Heritage Commission (Advisory)

Local/Regional Agencies and Organizations

City of Patterson Planning Department (Advisory)
City of Newman Planning Department (Advisory)
Local Agency Formation Commission (Permitting)
Merced County (Advisory)
Modesto Junior College (Advisory)
Newman-Crows Landing School District (Responsible)
Oak Flat Water District (Responsible)
Orestimba Water District (Responsible)
Orestimba Creek Flood Control District (Responsible)
Patterson Hospital District (Advisory)
San Joaquin County (Advisory)
Santa Clara County (Advisory)
Stanislaus County Board of Supervisors (Permitting)
Stanislaus County Planning Commission (Advisory)
Stanislaus County Department of Planning and Community Development (Staff)
Stanislaus County Public Works Department (Staff)
Stanislaus County Agricultural Commissioner (Staff)
Stanislaus County Air Pollution Control District (Responsible)
Stanislaus County Administrative Office (Staff)
Stanislaus County Counsel (Staff)
Stanislaus County Sheriff Department (Staff)
Stanislaus County Parks Department (Staff)
Stanislaus County Department of Environmental Resources (Staff)
Stanislaus County Housing Authority (Responsible)
Stanislaus County Transit District (Responsible)
Sunflower Water District (Responsible)
Turlock Mosquito Abatement District (Responsible)
West Stanislaus County Fire Protection District (Responsible)
West Stanislaus Resource Conservation District (Advisory)

F. APPROVALS

If the Stanislaus County Planning Commission and Board of Supervisors approve the proposed project, then the Commission or Board may take one or more of the following actions:

1. Certification of the Environmental Impact Report
2. Adoption of a General Plan Amendment
3. Rezoning of the Project Site
4. Adoption of a Specific Plan
5. Adoption of a Preliminary Development Plan for Phase 1
6. Adoption of a Development Agreement
7. Cancellation of the Williamson Act Contracts
8. Approval of Subdivision Maps, including vesting tentative maps, vesting parcel map, parcel maps, and/or final maps.

In addition there are a variety of other approvals that may be granted by the County or by other agencies in connection with this project. These may include one or more permits from the California Department of Fish and Game; one or more permits or mitigation programs from the U.S. Army Corps of Engineers; the formation of a community services district or a similar special district, and related approvals by the Local Agency Formation Commission and the Board of Supervisors; approvals, service agreements, and other actions by special district including approval of water service contracts; the formation of one or more Mello-Roos community facilities districts; benefit assessment districts, or similar financing mechanisms; actions by the California Department of Transportation relating to freeway access; approval by the County of additional subdivision maps; and various administrative approvals pursuant to the development agreement.

If a development agreement is adopted for the project, that development agreement may include provisions for subsequent approvals such as the final processing of tentative and final maps.

IV. ENVIRONMENTAL SETTING, POTENTIAL IMPACTS, AND MITIGATION MEASURES

A. LAND USE AND LAND USE PLANS AND REGULATIONS

Setting

Land Use Regulatory Background

Stanislaus County General Plan (SCGP)

Introduction. The entire 29,500-acre site is designated Exclusive Agriculture by the *Stanislaus County General Plan (SCGP)*. The SCGP states that this designation is intended for areas presently or potentially desirable for agricultural use. Typically these areas possess characteristics with respect to location, topography, parcel size, soil classification, water availability and adjacent usage which, in proper combination, provide a favorable agricultural environment.

Currently the most productive, or potentially productive, county agricultural lands are designated as prime agricultural lands and classified as "land of statewide importance". Fingers of prime agricultural land which are part of a larger area of off-site prime agricultural land extend on-site near the eastern edges of the project site in phases 4 and 5. This on-site prime agricultural land amounts to approximately 200 acres, or less than one percent of the project site.

Generally, the criteria used to identify prime agricultural lands include:

- All land which qualifies for rating as Class I or Class II in the Soil Conservation Services' land use compatibility classifications;
- Land which qualifies for a rating of 80 through 100 in the Storie index rating;
- Land which supports livestock used for the production of food and fiber and has the annual carrying capacity equivalent to at least one animal unit per acre as defined by the U. S. Department of Agriculture;
- Land planted with fruit or nut-bearing trees, vines, bushes or crops which have a non-bearing period of less than five years and will normally return during the commercial bearing period on an annual basis from production of unprocessed agriculture plant production not less than $200.00 per acre;
- Land which has returned from the production of unprocessed agricultural plant products an annual gross value of not less than $200.00 per acre for three of the previous five years.

The remainder of the project site outside of the prime agricultural areas is identified as potential or non-prime agricultural land. This is agricultural land identified as having the capability to become prime agricultural land through "normal agricultural investment and practices." The County prioritizes

conserving non-prime agricultural lands because of on-going trends reducing the quality and productivity of prime agricultural lands such as subdivisions, over-production, and urban intrusion.

The SCGP classifies county agricultural lands into two groupings:

- Broad base agricultural lands, where the majority of agricultural crops, dairy and poultry products are produced; and
- Limited base agricultural lands, where rangeland or non-irrigated pasture occurs.

All on-site agricultural lands, including prime and non-prime lands, are used as rangeland, except for a 1.5-acre test vineyard located in Village 1 Oak Flat. Consequently, the project site is considered limited base agricultural land in the SCGP.

The SCGP establishes policies to guide county growth. SCGP policies with bearing on the Diablo Grande project include:

- New areas for urban development (as opposed to expansion of existing areas) shall be limited to areas of diminished agricultural importance (SCGP, Land Use Element, Goal 1, Policy 10).
- Expansion of urban boundaries of unincorporated communities should be based on infilling and elimination of existing "islands" and should not permit leapfrog development nor create new "islands" (SCGP, Land Use Element, Goal 2, Policy 13).
- [Land] uses shall not be permitted to intrude into an agricultural area if they are detrimental to continued agricultural usage of the surrounding area (SCGP, Land Use Element, Goal 2, Policy 14).

Other SCGP policies considered to have a direct relationship to the project site include land use, circulation, conservation and open space, noise, and safety policies. They are discussed below in Impacts.

Zoning Ordinance

The site is zoned A-2-160. These are general agriculture districts, with an allowable residential building density of two dwelling units per 160 acres in the A-2-160 District. The zoning ordinance states that "it is the intent of these district regulations to support and enhance agriculture as the predominant land use in the unincorporated areas of the County" (Chapter 21.20.020). The A-2 zoning allows several non-agricultural uses, including cemeteries, schools, churches, sanitary land fills, and recreational facilities.

Williamson Act

The entire project site is currently under Williamson Act contract. Generally, the Williamson Act reduces property taxes on land constrained to uses for agriculture or open space. Williamson Act contracts are automatically renewed each year, and remain in effect for at least ten years.

Stanislaus County has voluntarily participated in the Williamson Act program since 1970. Countywide, the total contracted acreage increased each year until 1989. At that time it decreased 9,290 acres, from a previous County total of 707,242 acres in 1988 to 697,932 acres. Moreover, the County Assessor's Office reports an increase in notices of non-renewal and contract cancellations, particularly in the areas of north Modesto, Salida, Oakdale, Patterson and other areas along the I-5 corridor.

According to Government Code Section 51282, three possible ways to terminate Williamson contracts are available:

- Non-renewal, whereby a landowner files a notice of non-renewal at least nine years through the remaining term of the contract;
- Eminent domain, or the taking of private land by public agency for public use; and
- Cancellation, or the immediate release from all contract rights and liabilities which the government and land owner have on the property.

A landowner may be granted cancellation if the County meets the following criteria:

- A notice of non-renewal for the land has been filed;
- Cancellation is not likely to result in the removal of adjacent lands from agricultural use;
- Cancellation is for an alternative use consistent with the applicable provisions of the city or county plan;
- Cancellation would not result in discontiguous patterns of urban development; and
- No proximate, non-contracted land is both available and suitable for the proposed specified use; or development of the contracted land would provide more contiguous patterns of urban development than development of proximate, non-contracted land. Proximate non-contracted land is defined as non-contracted land which is sufficiently close to the contracted land that it can serve as a practical alternative for the use which is proposed for the contracted land.

For the cancellation to be in the public interest, the County must specifically find that:

- Other public benefits substantially outweigh the objectives of the Act;

- No proximate non-contracted land is both available and suitable for the specified use or development would provide more contiguous patterns of development than development of proximate non-contracted land.

In these cases, the Board of Supervisors must make specific findings, and the landowner must pay a penalty equal to 12.5 percent of the property's fair market value.

Stanislaus County Economic Strategic Plan (SCESP) and Stanislaus County Draft Agricultural Element (SCDAE)

In 1989, the Board of Supervisors accepted this preliminary Plan that outlines Stanislaus County's course of action for facing a future of unprecedented growth in the 1990s. The Plan is "preliminary" and does not contain official, adopted County policy.

Essentially, the Economic Strategic Plan (ESP) proposes a more aggressive approach to planning than under current policy. The ESP proposes an "alternative future" to the existing General Plan, as described in the "target scenario." The target scenario includes goals for population growth, jobs, housing units, and commuter traffic, as indicated in milestone intervals between 1990 and 2010.

Central to the target scenario is the concept of "remote development", that is, development which takes place away from existing urban centers. Under the existing General Plan, remote development is discouraged. A major goal of this remote development is to reduce the loss of prime agricultural lands in the County to urbanization.

The County is currently preparing a Draft Agricultural Element. Because this element is in the review process and has not been approved, it is not considered relevant to this analysis.

Countywide Agricultural Land Use Issues

Agriculture is the leading industry in Stanislaus County, due to the prime agricultural land within San Joaquin Valley. Table IV.A-A summarizes agricultural productio ... 1990. Accordingly, in 1990 the County's gross agricultural income was $1,038,356,000 (Stanislaus County 1990 Agricultural Crop Report).

Whereas the San Joaquin Valley contains the County's prime agricultural crops and irrigated pasture, the County's rangeland is located in the hills of the Diablo Range in the western portion of the County and the foothills of the Sierra Nevada in the eastern portion. Non-irrigated rangeland and irrigated pasture are used for grazing livestock, which, in 1990, represented the fourth largest agricultural commodity in the County. In 1990, the County had

Table IV.A-A - Agricultural Production Summary
Stanislaus County, 1990

Item	Harvested Acreage	Estimated Value
Fruit & Nut Crops	134,000	$249,383,000
Field Crops	613,000	111,221,000
Vegetable Crops	59,100	95,359,000
Seed Crops	3,770	3,770,000
Nursery Products	970	18,639,000
Apiary Products		4,754,000
Aquaculture		608,000
Livestock & Poultry		230,725,000
Livestock & Poultry Products		323,897,000
Total	810,840	$1,038,356,000

Source: Stanislaus County 1990 Agricultural Crop Report

359,000 acres of rangeland; 60-70 percent in the Diablo Range and 30-40 percent in the Sierra Nevada. Irrigated pasture in 1990 comprised 75,000 acres; 10-15 percent in the Sierra Nevada and 85-90 percent in the San Joaquin Valley (William Van Reit, November 1991).

Figure IV.A-1 shows the aggregate change, over 10 years from 1980 to 1989, in acreage used for irrigated pasture, rangeland, total field crops and total crops in Stanislaus County. Irrigated pasture and rangeland are two of 15 types of field crops. Total crops includes field crops, seed crops, vegetable crops, fruit and nut crops, nursery products, livestock and poultry products, and apiary products. Acreage data from 1990 is not included in Figure II.A-1 because different data collections methods were used, which caused acreage data to dramatically change. As shown in Figure II.A-1, county acreage devoted to agriculture has decreased during the ten-year period. Over this same period, total crops, rangeland and irrigated pasture acreage have remained essentially constant. This implies that field crop acreage, other than rangeland and irrigated pasture, has been converted to non-agricultural uses over the ten-year period.

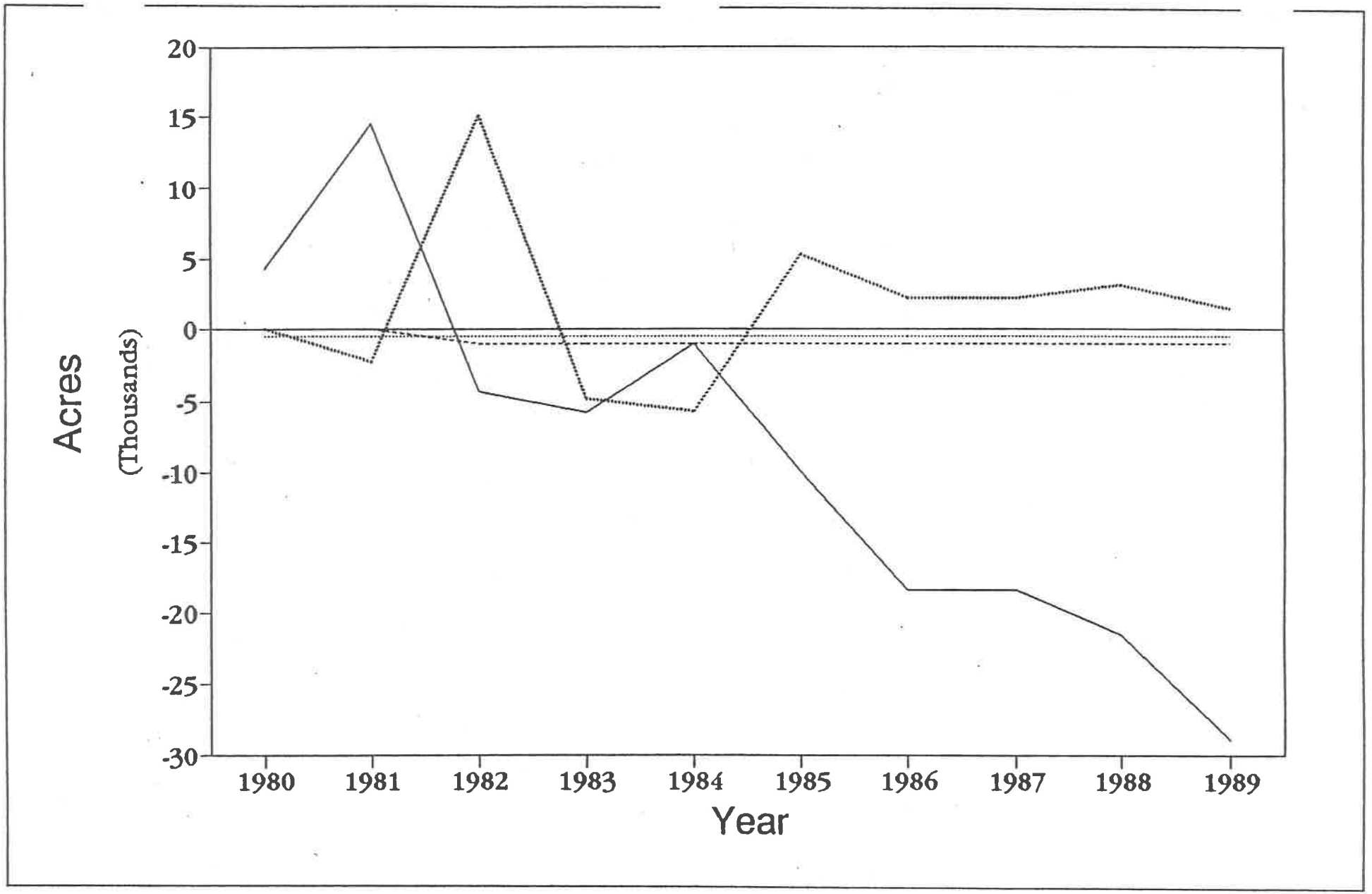
Regional Features and Land Uses

Features

The project site is located in the Diablo Range. Due to the range's extensive grassy, rolling hills, the primary range land use is cattle ranching (i.e., seasonal grazing). The range also has other open space uses, such as recreation, and some development. At the base of the range to the east of the project site is San Joaquin Valley, encompassing the entire eastern portion of the county. Valley land uses are predominantly prime agricultural lands, residential communities which support the agriculture industry, and the large urban areas.

Raines County Park and Minnear County Park are located along Del Puerto Canyon Road approximately two miles northwest of the site; each park has approximately 1,000 acres with camping and other recreational facilities. The parks are surrounded by private property, except for 40 acres owned by the Bureau of Land Management (BLM). Park usage has been steadily increasing in recent years, although existing facilities have excess capacity and no plans exist to further develop or expand the two parks (Eberwein, pers. comm.).

Henry Coe State Park is approximately three miles southwest of the site. It encompasses approximately 20,000 acres in Stanislaus County and 47,000 acres in Santa Clara County and has camping and other recreational facilities. Currently, the park is only accessible from the west side, in Santa Clara County, with plans to expand the park eastward along the Garzos Creek and establish an east-side entry point. A northern access point and campground are planned to extend from San Antonio Valley Road. However, no specific



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LEGEND

- Pasture
- Rangeland
- Total Field Crop
- Total Crops

LSA

Figure IV.A-1

Aggregate Acreage Change
Stanislaus County, 1980 - 1989

completion dates or funding have been identified for the planned park expansion (Breckling, pers. comm.).

Approximately 1.5 miles west of the site is a former U.S. Navy practice bombing range, leased from the Department of Interior from 1951 to 1968. Since operations have ceased, the site has been cleared of all remnants and debris (Lt. Commander Kelly, pers. comm.).

Incorporated Cities

Locations. Two of the County's incorporated cities are located along I-5, near the site. Patterson is the incorporated city closest to the site, located to the east of I-5, approximately seven miles northeast of the Phase 1 entry. Newman is along I-5, approximately 14 miles southeast of the Phase 1 site entry.

The County's other incorporated cities are primarily along State Route 99 (SR-99). SR-99 is east of I-5 and is the north/south primary transportation route in central San Joaquin Valley. At the northern end of SR-99 is Modesto, the County's largest city. South of Modesto along SR-99 are the cities of Ceres and Turlock.

Population and Housing. Table IV.A-B is a profile of the cities and unincorporated Stanislaus County areas based on 1990 Census information.

As shown in Table IV.A-B, in 1990 total countywide population was 370,522, or approximately 40 percent above the 1980 population of 265,900; in 1990, housing units totaled 132,027, or approximately 30 percent above the 1980 total of 102,280. This has caused the countywide average household size to increase from 2.6 people per unit in 1980 to 2.8 people per unit in 1990, an eight percent increase. Most of the county growth has occurred in incorporated areas. For example, Patterson's population increased to 8,626 in 1990 from 3,908 in 1980, while housing units rose to 2,703 units in 1990 from 1,351 units in 1980. This represents an average household size increase from 2.9 people per unit in 1980 to 3.2 people per unit in 1990; a ten percent increase. In 1990 Modesto's population had grown to 164,730, from 106,602 in 1980. Concurrently, housing units rose to 60,878 units in 1990, from 42,367 units in 1980. The average household size in Modesto rose to 2.7 people per unit in 1990 from 2.5 people per unit in 1980; an eight percent increase.

The disparity between population and housing growth, as evidenced by the increase in average household size, suggests that the County had fewer residential vacancies in 1990 than in 1980, and that construction housing starts were unable to match population growth during the ten-year period. Insofar as the 1980-1990 population growth rate exceeded the housing rate, new housing development apparently was not the primary inducement to countywide growth during the period.

Table IV.A-B - Population and Housing Census Information
Stanislaus County, 1980-1990

	1980 Population	1980 Housing Units	1980 Population Per Unit	1990 Population	1990 Housing Units	1990 Population Per Unit
Ceres	13,281	5,241	2.53	26,314	9,075	2.90
Denair[1]	2,892[2]	---	---	3,693	1,202	3.07
Hughson	2,943	979	3.01	3,259	1,088	3.00
Keyes[1]	2,486[2]	---	---	2,878	1,007	2.86
Modesto	106,602	42,367	2.52	164,730	60,878	2.71
Newman	2,785	1,031	2.70	4,151	1,520	2.73
Oakdale	8,474	3,463	2.45	11,961	4,606	2.60
Patterson	3,908	1,351	2.89	8,626	2,703	3.19
Riverbank	5,695	1,922	2.96	8,547	2,647	3.23
Salida[1]	2,033[2]	---	---	4,499	1,468	3.06
Turlock	26,287	10,927	2.41	42,198	15,400	2.74
Waterford	2,683	996	2.69	4,771	1,458	3.27
Unincorporated	93,242	34,003	2.74	95,965	32,652	2.94
TOTAL COUNTY	**265,900**	**102,280**	**2.60**	**370,522**	**132,027**	**2.81**

[1]Unincorporated communities, not inclusive of the total unincorporated Area of Stanislaus County.

[2]Source: Stanislaus County, *1987 General Plan.*

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Census data suggests that in the ten-year period 1980-1990, most new population and housing in the County occurred as expansion and infill of the County's incorporated cities. This is evidenced by a countywide population growth of 40 percent during the period compared to only three percent population growth in unincorporated areas.

Comparing trends in agricultural acreage uses to the countywide population and housing growth, suggests prime agricultural land, rather than rangeland and irrigated pasture, has been converted to residential land use.

Lakeborough Specific Plan

As of December 1991, the most significant proposed development with bearing to the project is the Lakeborough Specific Plan. Lakeborough is a proposed 4,328-acre community plan to be bounded by Salado Creek to the north, Crow Creek to the south and I-5 to the east. The Lakeborough site is near the west side of I-5 by the Fink Road interchange, approximately seven miles east of the Phase 1 site entry.

Lakeborough is proposed to consist of six villages. Residential uses would total 10,000 housing units, including 7,010 single-family and 2,990 multi-family units. Commercial uses would total 1,579,100 square feet of retail (including 816,750 square feet of regional mall), and 4,181,800 square feet of office and industrial uses. Open-space uses include a 197-acre golf course/country club and 183 acres in agricultural production.

County processing of this project application has been at a virtual hault since February of 1991, with no present indication if or when the project proponents will reactivate Lakeborough.

Wildfire Hazards

Fire hazards affect vegetation and wildlife habitats throughout the Diablo Range. The most critical weather period for potential wildfires is from May through November, when the moisture levels are very low. Wildfire risk is a serious hazard in undeveloped areas, in particular those with unirrigated vegetation. Several factors affect the degree of wildfire hazard, including atmospheric humidity, slope steepness, vegetation type, exposure to solar radiation, wind speed and direction, presence of human activities, and accessibility to fire fighting equipment.

Wildland fire hazards vary from moderate to extreme, depending on existing ground fuels and geographic characteristics. Natural vegetation types within the Diablo Range include grasslands, brush and woodland. For many of these vegetation types, wildfire is an integral part of their ecological cycle.

Fire hazards from these three fuel types include:

- Grassland fires, which ignite easily, particularly in dry seasons. These fires are easily controlled if they are accessible by fire equipment.
- Brush fires, which tend to burn fast and hot.
- Woodland fires, which tend to burn relatively cool. However, a brush fire may spread to a woodland area, generating a hot crown fire.

Although fires fueled by different vegetation types have varying characteristics, vegetation types occurring on the project site possess common traits including vulnerability to fire during the dry season when plant moisture content is low, rapidly spreading fires during the warm windy season, and rapid convection when fires burn on steep slopes (Chief Geyser, pers. comm.).

Land Uses Nearby and Adjacent to the Site

The adjacent uses are private, non-prime agricultural land used for cattle grazing and contain few residences and ranching related improvements. In total, the site is bordered by 51 distinct parcels with approximately 28 different owners. The bordering parcels range in size from approximately 43 acres to 3,200 acres. Isom Ranch, a 640-acre parcel, and a 160-acre ranch, are inholding properties.

On-site Oak Flat Road/Phase 1 Features and Land Uses

Oak Flat Road

The proposed Oak Flat Road alignment is defined as the 100-foot right-of-way (ROW) which includes the existing Oak Flat Road. Oak Flat Road is an 11 mile, east-west roadway extending off Ward Avenue, a north-south roadway, at a point approximately 3.5 miles south of Patterson. It is a County-maintained two-lane road with unimproved dirt and gravel except for a paved segment near I-5. At the mouth of the valley adjacent to the south side of the paved segment is a cherry orchard. Except for this orchard, the remaining adjacent and nearby land use to the roadway is open space used primarily for grazing. From Ward Avenue trending west approximately 2.5 miles, this open space is characterized by rolling grassy hills, devoid of any brush, trees, or outcroppings. At the 2.5-mile point the roadway crosses Salado Creek with a one-lane bridge. From this point the roadway generally follows the Creek with about six crossings, winding through increasingly-steep terrain approximately 4.5 miles to the Phase 1 site entry. The roadway trends southwest across the Phase 1 site, terminating near the juncture where Lotta Creek flows into Salado Creek. The open space surrounding the approximately 8.5-mile segment from the Salado Creek crossing to the termination point contrasts to the initial segment from its varied elements and land features. These include areas of multi-layered riparian vegetation, numerous stands of oak, pepper and other trees, brush areas, and rock outcroppings.

Phase 1 Area

Features. Two residences and ancillary out-buildings exist on the Phase 1 site. These improvements house ranch workers. Near the Oak Flat Road entry is a mobile home occupied by a resident employee. An owner-occupied residence is located on a knoll on the east part of the site. The residences are served by on-site well water and a septic tank system. In the immediate area of the ranch workers' residence are additional buildings used for ranching activities, such as barns and storage buildings. Approximately 1.5 acres of the site has been planted with an irrigated vineyard.

Agriculture. The Phase 1 site consists of Class V, VI, and VII soils. According to the California Department of Food and Agriculture, *Report on Environmental Assessment of Pesticide Regulatory Programs, Stanislaus County, 1978 Edition*, these soils have "agricultural use limited to pasture and range, generally upland areas." Due to both soil type and lack of irrigation, the crops grown on the Phase 1 site have been limited to range grasses for livestock grazing. All of the 2,000 acres of the Phase 1 site, except for the vineyard, typically support between 400 and 900 head of cattle, depending on drought conditions.

The entire Phase 1 site is under Williamson Act Contract, and, as such, has the status of agricultural preserve.

Wildfire Hazard. According to the Stanislaus County General Plan, the Phase 1 site has the County's highest possible annual critical wildfire weather frequency. This determination is based on the California State Division of Forestry definition of wildfire hazards; which considers factors including vegetation, ground slope and seasonal rain fall. However, infrequent human presence on the Phase 1 site helps to decrease fire hazard.

Hazardous Materials and Waste. The State Department of Health Services, Regional Water Quality Control Board and County Department of Environmental Health believe that no major hazardous materials are likely to be on the Phase 1 site, due to historical ranching uses (Farrelly, Garcia, pers. comms.). However, fuel storage tanks are typically found on ranch sites and represent the possibility of soil contamination. If a geotechnical survey and records search is conducted, it potentially could confirm the absence of hazardous wastes on the Phase 1 site (Fourt, pers. comm.). Such a survey should be done prior to Final Map approval.

Overall Project Site Features and Land Uses

On-site Features

The 29,500 acres of the site, including Phase 1, have geographic characteristics similar to the Phase 1 site; rolling hills bordered by steep sided ridges with grasslands, oak woodlands, savannahs, and sparsely vegetated riparian corridors. Access to the site is via Oak Flat Road, which enters the site at the Phase 1 eastern border. The site is approximately 5-13 miles west of I-5, the north/south primary transportation route in the west County area. Secondary site access is by Del Puerto Canyon Road, a County-maintained east-west roadway, at the location of Phase 2. A steep private road extends from this roadway into the northeast portion of the Phase 1 site, extending over the crest to connect at the on-site termination of Oak Flat Road.

Remnants of ranch settlements from the late 19th century exist on and near the site. Prehistoric village midden soil sites; bedrock grinding stations and rock shelters with pictographs also exist on the site. The site's cultural resources are further described in the Cultural Resources section of this report.

Agriculture

Ranching activities (i.e., seasonal cattle grazing) have occurred more-or-less continuously on-site for 100 years or more. In more recent years, ranching has consisted of steer and heifer operations. Typically, livestock are brought on-site in October and sold in May. In past years, the entire 29,500 acres have supported 7,000 to 8,000 head, or roughly four gross acres of ranch land per head. In recent years, due to drought conditions, the land has supported approximately 5,000 head of cattle (six gross acres of ranch land per head of cattle). However, a site reconnaissance indicates that portions of the site contain little grazing value. In addition, the site has been significantly overgrazed.

The soils and irrigation conditions of the site limit agriculture within the site to grazing. However, the Stanislaus County General Plan recognizes the soils within the drainages of Crow and Orestimba Creeks, which are part of phases 4 and 5 respectively, as prime agricultural land or Farmland of State Importance. The following guidelines are used to classify such soil types:

- Prime Farmland: Land with the best combination of physical and chemical features for the production of agricultural crops.
- Farmland of Statewide Importance: Land with a good combination of physical and chemical features for the production of agricultural crops.

While the drainages do have soil content indicative of these classifications, they have poor access, steep slopes and limited size which prevent them from functioning as prime agricultural land.

Wildfire Hazard

The vegetation and climatic conditions of the remainder of the site are similar to Phase 1. Therefore, these areas, along with all of the Diablo Range, have the highest fire hazard in the County.

The western portion of the site burned in 1936 as part of a 100,000 acre wildfire. The only other large fire in the site occurred in 1966, when approximately 520 acres burned. Since 1980, the site has had approximately two small fires covering less than four acres (Battallion Chief Athey, CDF, fax comm.).

Hazardous Materials and Waste

The State Department of Health Services, Regional Water Quality Control Board and County Department of Environmental Health believe that no major hazardous material is likely to be on the overall site, due to historical uses of ranching and grazing-crop farming. However, as with Phase 1, a geotechnical survey and records search would be required prior to Final Map approval for each phase of the project.

Potential Impacts

Consistency with SCGP and Zoning

Proposed SCGP Land Use Designation

The project would designate the entire project site as Specific Plan.

- 10,765 acres, or approximately 36 percent of the entire 29,500-acre site would be used for residential and employment development:
- 520 acres or approximately two percent would be roadways;
- 5,545 acres or approximately 19 percent would be open space uses including golf courses, parks, creekways, village greenbelts on hill areas and 40 acres of vineyard.
- 12,670 acres, or approximately 43 percent of the site, would be in Conservation Areas. This area would include 100 estate residences.

The proposed 40 acres of vineyard is consistent with the County's current objective of improving non-prime agricultural land for prime agricultural land uses. The proposed 12,670 acres of Conservation Area or 43 percent of the entire site is consistent with the non-prime agricultural land classification, because it would conserve this land for possible grazing uses, except in the areas to be used for the proposed 100 estate lots. The remaining 16,790 acres or 57 percent of the site is proposed for uses other than agriculture.

In a more regional context, removing the 16,790 acres of non-prime agricultural land would be a preferable alternative to allowing equivalent development in the County's prime agricultural land areas. For example, the communities of Modesto, Ceres, and Patterson are surrounded by prime agricultural land and any expansion of those communities would unavoidably encroach on prime agricultural land. Consequently, the project could be viewed as consistent with the County goal to protect agriculture by redirecting pressures for growth in Stanislaus County away from areas of prime agricultural land, albeit these pressures are redirected to areas of non-prime agricultural land.

SCGP Policies

Selected SCGP policies with bearing on the project are stated below, followed by evaluations of project consistency.

Land Use Policies.

- *Policy 2: Land designated agricultural shall be restricted so that there is no impediment to continued agricultural use of the property.*

The project site would be removed from agricultural use and, as currently designated, would therefore be inconsistent with this policy. However, with the General Plan amendment from Agriculture to Specific Plan, the project would be consistent. (Consistent)

- *Policy 3: Land use designations shall be consistent with the criteria established in this element.*

The project proposes a General Plan amendment for the project site for Specific Plan. In the Specific Plan section of the General Plan, areas considered appropriate for Specific Plan designations are very large single-ownership properties in non-urban settings where significant mixed-use communities are proposed. This criteria is consistent with the project site. (Consistent)

- *Policy 7: Riparian habitat along the rivers and natural waterways of Stanislaus County shall to the extent possible be protected.*

Major Creeks, such as Salado Creek, Lotta Creek, Crow Creek and Orestimba Creek and their riparian corridors will be preserved primarily in their natural condition. Exceptions include necessary road crossings, golf course improvements, and the creation of ponds. It is estimated that such improvements will take place on less than 20 percent of the creek ways. Setbacks of development of at least 100 feet from the major creek centerlines will normally be adhered to except where lesser distances are required for roads and golf course fairway improvements. (Consistent)

- *Policy 10: New areas for urban development (as opposed to expansion of existing areas) shall be limited to areas of diminished agricultural importance.*

The project site is primarily designated as agriculturally limited, or non-prime agricultural land. The two exceptions occur along Orestimba and Crow Creeks on the eastern border of the site, where lands have been designated as prime, or Land of Statewide Importance. These two small areas of land are the western extent of prime agricultural land, or Land of Statewide Importance in the County. (Consistent)

- *Policy 11: Development of residential areas shall be adjacent to existing compatible unincorporated urban development.*

This policy appears to be addressing smaller proposals and does not appear to address remote development projects such as Diablo Grande. The proposed project would not occur adjacent to existing developed areas, but would plan for all land uses within the Specific Plan area. The entire Specific Plan area is to be surrounded by a greenbelt, as defined in the Land Use plan, in order to increase compatibility with surrounding uses. (Not considered applicable)

- *Policy 14: Uses shall not be permitted to intrude into an agricultural area if they are detrimental to continued agricultural usage of the surrounding area.*

The project would not result in any direct adverse impacts on surrounding agricultural land. The proposed on-site Conservation Areas would serve to buffer the development from adjacent agricultural uses. However, the project may result in growth-inducing pressures within the region, causing eventual indirect adverse impacts to surrounding agricultural land. (Consistent)

- *Policy 15: Agriculture, as the primary industry of the County, shall be promoted and protected.*

Two implementation measures listed for this policy are:

- *As land is designated to accommodate new business, the County shall give priority to utilize lands of diminished agricultural importance.*
- *Specific Plans shall be encouraged when non-agricultural uses are proposed within areas designated for agriculture*

Most of the project site is identified as non-prime agricultural land. The proposed specific plan designation for the project site would be consistent with this policy. (Consistent)

- *Policy 16: Promote diversification and growth of the local economy.*

The project includes 97 acres of employment uses, including 26 acres of research campus and 31 acres of resort. Most of the employment based land use is proposed for Village 1 Oak Flat. (Consistent)

- *Policy 20: Three acres of neighborhood parks should be provided for every 1,000 residents.*

The project is proposed to include 264 acres of community parks, including 60 acres each in phases 1 and 2, 80 acres in phase 3, and 20 acres each in phases 4 and 5. Using the standard of three acres per 1,000 residents, the proposed community park would serve a population of 30,000 people, while the completed project would have a projected population of approximately 12,000 people. (Consistent)

- *Policy 21: Sheriff and fire protection shall be provided.*

The project includes a public safety officer to coordinate protection services of the project with the local fire protection district, County Sheriff, Emergency Preparedness Office and other public officials as needed to provide adequate public safety and responses to emergencies in Diablo Grande. The project proposes that either an on-site sheriff's substation be developed as part of a public safety center in the Town Center, or financial contributions to provide for a substation in Lakeborough will be made. Diablo Grande would have its own private security patrol services to augment County protection. (Consistent)

- *Policy 22: Future growth shall not exceed the capabilities/capacity of the provider of services such as sewer, water, fire, solid waste management, road systems, schools, etc.*

The project proposes to provide public facilities and utilities. The Diablo Grande public facilities plan would provide for facilities, fees, and community service district participation. Among its features:

- Land and office space would be provided in the town center for a Community Service District (or other form) for management and operation of Diablo Grande.
- Land and/or fees would be reserved for the School District to provide adequate elementary, intermediate, and high school facilities.
- The Western Hill Water District has been formed to meet both short and long term domestic, agricultural and recreational water requirements.
- A self-contained sewer treatment system utilizing greywater reclamation would be provided to meet all but the remote estate needs of the community. The estates would be served by septic tanks.
- Land would be set aside in future phases of development for solid waste disposal on an as needed basis. (Consistent)

- *Policy 23: New development shall pay its fair share of the cost of cumulative impacts to the circulation system.*

Funding to provide site access would utilize joint cost sharing of existing and planned circulation facilities including freeway interchanges, frontage roads, major public roads, and park-and-ride lots. Agencies expected to contribute include Caltrans, Stanislaus County, the City of Patterson, and Lakeborough. Through this coordinated effort, the project applicant would pay an appropriate share of the costs to mitigate cumulative impacts to the existing roadways. (Consistent)

Circulation Policies.

- *Policy 1: Development will be permitted only when facilities for circulation exist, or will exist as part of the development, to adequately handle increased traffic.*

On-site and off-site circulation improvements would be constructed on a schedule coordinated with requirements generated by new development. (Consistent)

- *Policy 2: Circulation systems shall be designed to promote safety and minimize traffic congestion.*

The project's circulation system is intended to meet all safety and level of service standards. The system would be amended if further evaluation warrants change. (Consistent)

- *Policy 4: A circulation system shall be developed that provides for streets in all classifications (freeway, major, collector, local and minor) as necessary to provide access to all parts of the County based on the anticipated land use.*

Off-site access would include improvements to freeway interchanges, major arterials, collectors, local and minor roadways, coordinating with other concerned agencies including Caltrans, Stanislaus County, Patterson, and Lakeborough. (Consistent)

- *Policy 5: Transportation requirements of commercial and industrial development shall be considered in all planning, design, construction, and improvements.*

The required street network necessary to accommodate the proposed commercial and industrial development is included in the project's site plan. (Consistent)

- *Policy 6: Bikeways and pedestrian paths shall be routed to provide reasonable access from residential areas to major bicycle and*

pedestrian traffic generators such as schools, recreation facilities, centers of employment, and shopping areas.

The project includes a multi-modal system of cycling and pedestrian paths, and riding and hiking trails. These paths and trails would provide access to the entire project site, continuing along Oak Flat Parkway- the major arterial to Lakeborough and I-5. (Consistent)

Conservation/Open Space Policies.

- *Policy 1: Maintain the natural environment of areas dedicated as parks and open space.*

The project proposes to set aside 12,670 acres or approximately 43 percent of the project site as Conservation Areas, comprised of ridgelines, steeper hillsides, creekways and rock outcroppings. Land in these areas would be regulated by a Diablo Grande environmental control committee, including land designated for up to 100 residential estates on lots ranging from three to 40 acres each, or 300 to 4,000 acres total. This estate land would reduce the Conservation Areas to between approximately 29 to 42 percent of the project site. (Consistent)

- *Policy 2: Assure compatibility between natural areas and development.*

All project villages are nestled in the project site and surrounded by protected open space greenbelts. The project designates approximately 12,670 acres of Conservation Areas which would provide open space buffers of project development from the surrounding off-site land-uses, which are primarily agricultural. (Consistent)

- *Policy 3: Areas of sensitive wildlife habitat and plant life shall be protected from development (e.g. vernal pools, riparian habitats, etc.).*

The Conservation Areas would be set aside for continued use as remote pasture wildlife habitat, limited recreation, and low density residences. Setbacks of development are proposed of 100 feet from the major creek centerlines, except where lesser distances are required for roads and golf course fairway improvements. Riparian corridors to benefit would include Salado Creek, Lotta Creek, Crow Creek and Orestimba Creek, although crossings and other encroachments may affect up to 20 percent of the creekways. (Consistent)

- *Policy 4: Protect groundwater aquifers and recharge areas, particularly those critical for the replenishment of reservoirs and aquifers.*

The project proposes that ponds and reservoirs be constructed for multiple uses including flood control, storage, golf course water elements and reclaimed waste water uses. In addition, the proposed project intends to develop a conventional underground storm water system. (Consistent)

- *Policy 5: Preserve vegetation to protect waterways from bank erosion and siltation.*

The project proposes creek setbacks to decrease the possibility of erosion. The riparian corridors of Salado Creek, Lotta Creek, Crow Creek and Orestimba Creek would be protected through setbacks of up to 100 feet, except at crossings. (Consistent)

- *Policy 8: The County will investigate additional sources of water for domestic use.*

The applicant has formed the Western Hills Water District and is pursuing both long-term and interim water supplies. Water sources and issues are discussed in the Services section of this report. (Consistent)

- *Policy 9: Discourage the division of land which forces the premature cessation of agricultural uses.*

The project proposes the phasing out of agricultural uses over the next 25 years on all of the site's 29,500 acres, except for 41 acres of proposed vineyards. Development of the Phase 1 site would include removal of ranching facilities which are used for the entire site. (Inconsistent)

- *Policy 10: In areas designated "Agriculture" on the Land Use Element, discourage land uses which are incompatible with agriculture.*

The project proposes an amendment to the General Plan, which would change the designation from "Agriculture" to "Specific Plan". This proposed designation would be consistent with this policy. The project's Conservation Areas would buffer on-site development from surrounding off-site agricultural uses. (Consistent)

- *Policy 11: The County will work to investigate additional sources of water for irrigation uses.*

The project would include 41 acres of vineyards. An on-site public water district has been formed to meet both the short and long term domestic, agricultural and recreational water needs of the community. Golf course irrigation is proposed to consist of at least 20% reclaimed water. (Consistent)

- *Policy 12: Provide a system of local and regional parks which will serve the residents of the County.*

The project proposes a broad mix of resort and recreational facilities and open space areas. The Conservation Areas would have pedestrian and equestrian trails. Village parks facilities would be included on 264 acres. (Consistent)

- *Policy 14: Provide for diverse recreational opportunities such as horseback riding trails, hiking trails and bikeways.*

The project would include trails for equestrian, hiking, and biking and village park facilities. (Consistent)

- *Policy 16: Discourage development on lands that are subject to flooding, landslide, faulting, or any natural disaster to minimize loss of life and property.*

Generally, portions of the project site sensitive to landsliding are proposed for open space. On-site flooding is minimal and restricted to areas where the creeks exiting the creeks cross alluvium. The project proposes measures to reduce flooding, such as new ponds, new reservoirs, and a conventional underground storm water system. Splays of active faults exist on the site, with movement in the past 10,000 years. Generally, development is sited to avoid fault zones. (Consistent)

- *Policy 19: Circulation systems shall be designed and maintained to minimize traffic congestion and air pollution.*

The project applicant is studying the use of electric cars for approximately one half of the project trips in Phase 1 as potential mitigation. The potential mix of resort destination land uses, retirement housing, home occupations, on-site jobs and less dependence on out-commuting at peak hours are project factors that help reduce traffic congestion and air pollution. Other complimentary forms of transportation include bus and van service, rideshare parking, and helistop service. (Consistent)

- *Policy 20: Industrial and commercial development proposals shall include effective methods for reducing air pollution.*

The project proposes land set aside for light industrial uses, and/or other research and development uses that can meet noise, air and odor pollution standards as determined by Stanislaus County. This would contribute to opportunities for balancing on-site jobs and housing. The use of ridesharing lots would contribute to reducing the potential levels of traffic, noise, and air pollution within the project site. (Consistent)

- *Policy 23: The County will encourage and support efforts to recycle materials for remanufacture, and encourage and support programs to reduce wastes at the source and reuse wastes where feasible.*

Project-generated solid waste would be hauled to the Fink Road Landfill and Waste-to Energy Facility by Bertolotti Disposal Service. Approximately 27

percent of the present solid waste is landfilled, 47 percent is incinerated, and 25 percent is recycled. The project would incorporate recycling programs for residential, commercial, and industrial wastes. On-site waste water treatment would allow reuse of treated water for irrigation of landscaping or golf courses. (Consistent)

Noise Policies.

- *Policy 5.2.1: New development of residential or other noise sensitive land uses will not be permitted in noise-impacted areas unless effective mitigation measures are incorporated into the project design to reduce noise levels.*

Where appropriate, the project would incorporate mitigation measures to reduce noise levels to meet noise level performance standards specified in the General Plan. (Consistent)

- *Policy 5.2.2: New development of industrial, commercial or other noise generating land uses will not be permitted if resulting noise levels will exceed 60 dB Ldn (or CNEL). Additionally, the development of new noise-generating land uses which are not preempted from local noise regulation will not be permitted if resulting noise levels will exceed the performance standards contained within Table II in areas containing residential or other noise-sensitive land uses.*

Mitigation would be implemented to avoid exceedance over County noise standards. (Consistent)

- *Policy 5.2.3: Prior to the approval of a proposed development of residential or other noise-sensitive land uses in a noise-impacted area, or the development of an industrial, commercial or other noise generating land use in an area containing noise-sensitive land uses, an acoustical analysis shall be required. . .*

Project development would be required to comply with this requirement. (Consistent)

- *Policy 5.2.4: Stanislaus County shall develop and implement procedures to ensure that requirements imposed pursuant to the findings of an acoustical analysis are implemented as part of the project permitting process.*

The County will apply the findings of the noise assessment prepared for the project, and additional findings in this EIR, as part of the project permitting process. (Consistent)

Safety Policies.

- *Policy 4: Development west of I-5 in areas susceptible (as identified in this element) shall be permitted only when a geological report is presented: a) with documented evidence that no such potential exists on the site, or b) identifying the extent of the problem and the mitigation measures necessary to correct the identified problem.*

The hillside areas of the site most susceptible to landslides are proposed as Conservation Areas. Residential development would occur primarily in the flat, low lying areas. Additional slope stability analysis is included elsewhere in this EIR. (Consistent)

- *Policy 6: All new development shall be designed to reduce safety and health hazards.*

The proposed development would include back-lighted address numbers, proper street lighting, proper setbacks, adequate fire breaks, building designs that minimize crime, adequate road widths and pedestrian/bicycle pathways, adequate access for emergency vehicles, proper erosion and storm control measures, and proper sewage and solid waste disposal. (Consistent)

- *Policy 7: Adequate sheriff and fire protection shall be provided.*

The project includes a public safety officer to coordinate protection services of the project with the local Fire Protection District, County Sheriff, Emergency Preparedness Office and other public officials as needed to provide adequate public safety and responses to emergencies in Diablo Grande. The project proposes that either an on-site sheriff's substation be developed as part of the public safety center in the Town Center or financial contributions to provide for a substation in Lakeborough be made. Diablo Grande would have its own private security patrol services to augment County protection. (Consistent)

Zoning

The proposed General Plan amendment would require rezoning of the site in order to maintain consistency between the SCGP and the Zoning Ordinance. The proposed project would be re-zoned as "Specific Plan" (S-P) pursuant to chapter 21.38 of the County Zoning Ordinance. The project site would have an underlying or combined zone classification based on the zoning districts contained in the zoning ordinance as modified by the Specific Plan. Generally, underlying residential zoning would be provided in all five villages, neighborhood commercial and planned development zoning would be used for employment uses, and general agricultural zoning would be designated for the four major Conservation Areas.

Phase 1 Land Use Impacts and Concerns

Phase 1 Population and Employment Issues

Population and Wage-earners. Table IV.A-C: "Phase 1 Residences, Population and Resident Wage-earners" provides information on Phase 1 housing types and projections of population and wage-earners. The table is the basis of the discussion below.

The project would develop three housing types totaling 1,965 units, plus or minus 15 percent (1,670 to 2,260 units). Fifty-five units (in addition to the 1,965) may be built in the area designated Polo Field. If 1,965 units are developed, according to housing type, 950 are planned to be single family detached (SFD), 595 to be single family attached (SFA), and 420 to be multiple family (MF).

The developer expects marketing of the three housing types to attract permanent and seasonal residents, some of which would be retired. Based on housing types and marketing and utilizing generating factors developed by this EIR, Table IV.A-C projects future population of Phase 1 to be 4,517, of which 933 would be wage-earners.

(b) Employment Opportunities. Construction jobs would be generated by the project up to build-out, expected in 2005. Project-dependent economic activity would include jobs for construction workers and sales of building supplies. Project-dependent construction economic activity would be regionally based, and may be considered a short-term economic benefit of the project.

Long-term project-dependent economic activity would include:

- permanent jobs at the commercial, restaurant, and professional office development in the Phase 1 project site;
- permanent jobs at the on-site golf course and recreational facilities, including golf course, polo field, golf shop, maintenance, and security;
- permanent jobs at the research campus employment center;
- permanent jobs for on-site community service providers including the sewage treatment plant, parks, police and fire protection, maintenance and administration;
- part-time and temporary jobs for service providers of residences and other development.

The size and diversity of Phase 1 would result in significant new employment opportunities. The applicant projects that the employment land uses in the Oak Flat Village and entry area would accommodate 1,310 jobs, at 17 jobs/acre for 77 acres of development.

Table IV.A-C
Phase 1 Residences, Population and Wage-earners

Unit Type	Resident Type	Number Of Units (1)	Percentage Unit Type (2)	Number of Households (3)	Number of Residents (4)	Number of Wage-earners (5)
Single Family Detached	Permanent	950	51.4	488	1514	537
	Seasonal	950	10.0	95	295	0
	Retirement	950	38.6	367	909	0
Single Family Attached	Permanent	595	40.7	242	557	266
	Seasonal	595	13.0	77	178	0
	Retirement	595	46.3	275	507	0
Multiple Family	Permanent	420	28.0	118	212	129
	Seasonal	420	24.0	101	181	0
	Retirement	420	48.0	202	290	0
Totals				1965	4643	933

Assumptions

- Employable residents per permanent household:	1.1
- Employable residents per retirement and seasonal household:	0.0
- residents per single family detached household:	3.1
- residents per single family attached household:	2.3
- residents per multiple family attached household:	1.8

- retirement residences have 20 percent fewer residents per household

Notes:
(1) Derived from Land Use Plan
(2) Derived from Marketing Plan
(3) Derived by multiplying the Number of Units by the Percentage of Unit Type
(4) Derived by multiplying the Number of Households by the number of residents per unit type
(5) Derived by multiplying the Number of Households by the number of wage-earners per unit type

Development Impacts to County Agricultural Land Resources

Impacts to Rangeland and Ranching. The Phase 1 site is 2,000 acres, of which 80 percent or 1,600 acres is cattle rangeland, representing 0.4 percent of the County's total 1990 inventory of 359,000 acres of rangeland. Development of Phase 1 would result in the unavoidable termination of all ranching activities on the Phase 1 site; the loss of this 2,000 acres would not be considered a significant adverse impact.

In addition to the Phase 1 site, the overall site contains 22,000 acres of cattle grazing land, or six percent of the County's total grazing acreage. Without mitigation, all cattle grazing on the overall site potentially could be terminated because of the loss of the Oak Flat Ranch facilities and ranching activities on the Phase 1 site. This reduction of the County's agricultural base would be considered a significant adverse impact of the project if not mitigated.

Prime Farmland Impacts. In the 1980s, growth in Stanislaus County occurred primarily in the urban-serviced incorporated areas in the San Joaquin Valley. Growth is projected to continue to occur in Stanislaus County through the 1990s. Continual urban encroachment of the San Joaquin Valley is considered to have adverse impacts on the County's inventory of prime farm land, an issue of Statewide concern.

As an alternative location for development, Phase 1 would provide an opportunity to direct future Countywide growth away from the San Joaquin Valley. If a portion of future growth that would otherwise occur on the County's prime farmland, instead would be directed to the Phase 1 site, then development of Phase 1 could be considered to have a mitigating effect on the on-going development pressure on the County's prime farm lands.

Growth Inducement Issues and Impacts

Impacts of Upgrading Oak Flat Road. Oak Flat Road and its extension to Del Puerto Canyon Road would serve as the primary access to and from the site and would be upgraded and partially realigned to a shouldered, two-lane, paved connector. The off-site land adjacent to Oak Flat Road is currently planned and used for agricultural uses, including an orchard and grazing. Upgrading Oak Flat Road would improve access to this adjacent land leading to and from the project site. Consequently, the upgraded roadway along with increased activity from development of Village 1 and the overall project may induce growth pressure, contributing to future off-site development proposals alongside Oak Flat Road.

If any such future development proposals occur, they would be subject to County and public review. They would require General Plan amendments, rezoning, and specific plans allowing the County to assess whether such

proposals would meet its goals and objectives and environmental evaluations as required as per CEQA.

Development of the Phase 1 Site. The site is currently in open space, except for the Oak Flat Ranch facilities. The project would introduce circulation and community service-infrastructure, development and recreational facilities to the Phase 1 site. Development of Phase 1 would result in three growth-inducing factors:

- inducing associated residential, employment, and visitor populations to the site;
- increasing the inventory of County land committed for future development;
- removing existing development constraints by introducing infrastructure to the Phase 1 project site which potentially may be extended or upgraded to serve off-site development and/or the site's open space areas based on future proposals.

Except for the ranching activities, the existing site does not support or induce substantial residential or visitor populations. Inducing associated residential, employment, and visitor populations to the site is considered an unavoidable impact of the project. However, it is not necessarily considered to be an adverse impact.

For several years the County has experienced a rate of population growth which has resulted in fewer vacancies of existing homes and a growing construction industry. It is unknown whether increasing the inventory of land committed for future development would induce greater in-county immigration during the 1990s and beyond, due to the multitude of economic, planning, and political issues that must be factored into such a determination. However, due to the scale and magnitude of the project, a reasonable worst-case scenario must assume that increasing the inventory of developable land potentially would result in inducing some immigration to Stanislaus County.

Generally, introducing infrastructure to an unserviced area provides a framework for potential future proposals for off-site development. Typically, three approaches are available for reducing this potential impact:

- sizing infrastructure to avoid excess capacity;
- rescinding or otherwise limiting development rights from off-site developable land that potentially may be serviced by introduced infrastructure;
- designating the land in such a manner as to eliminate future development.

Issues regarding the sizing of infrastructure in relation to the requirements of Phase 1 are discussed in the Traffic and Public Services sections of this EIR.

Infrastructure sources such as water, gas, and electrical service for the Phase 1 site would likely originate near I-5, along Oak Flat Road. The Phase 1 development would also involve paving Oak Flat Road and increased road usage from the new residents. Therefore, it is likely that significant inducement to future off-site development adjacent to the Oak Flat Road would result from Phase 1 development. Growth pressure would be greatest along the road closest to I-5, because the terrain of off-site land is most suitable to development and Interstate 5 traffic would potentially generate additional patronage.

Adjacent to the Phase 1 site is Village 2 (Copper Mountain), the Salado Conservation Area, Village 4 (Crow Creek), Village 3 (Indian Rocks), and the Copper Mountain Conservation Area. Development scenarios proposed for the villages are discussed below in Overall Project Site. By allowing only limited development of estate homes in the proposed hill Conservation Areas, the project helps to reduce the potential for future expansion of infrastructure (and development) into these areas as part of a future proposal.

Open Space Issues

Impacts on Countywide Open Space Lands. The 2,000 acres which comprise the Phase 1 site are currently undeveloped agricultural preserve. As stated in Table III.D-E in the Project Description, the project would commit approximately 920 acres to development (including polo field housing). This potential impact would be offset by committing approximately 1,080 acres to open space uses, including 330 acres of golf courses and club, 78 acres of parks, 41 acres of vineyards, 40 acres of creek conservation areas, and 584 acres of hill conservation areas.

The creek and hill conservation areas potentially provide the most substantial open space mitigation by protecting and, possibly, enhancing the existing open space conditions in 624 acres of the site. The project provides pedestrian trail opportunities in these areas which would enhance the County's resources of permanent open space.

The resident population would use park facilities near the site, including Raines County Park, Minnear County Park and Henry Coe State Park. Henry Coe State Park, although much larger than the County parks, is not accessible from the east and is not easily reached from the site. However, expansion of the State Park is under consideration. Proposed plans could potentially expand the Park eastward and create an east side access point, which would make the Park very convenient for residents of the project.

Impacts of Development on Open Space. The potential for mitigating open space impacts is diminished by the proposal to allow up to 100 estate lots ranging in size from three to 40 acres each in the Conservation Areas. This low density development in the Conservation Areas would have impacts due

to the cumulative effects associated with roads, development, and resident population and activities. This is considered a potentially significant impact as it could be incompatible with the open space land uses.

Residential development is proposed along three cul-de-sacs on the east side of Oak Flat Parkway. The cul-de-sac areas consist of drainages with high biological value. In addition, the cul-de-sac development would be visible to many homes along the lower slopes west of Oak Flat Parkway, diminishing the expansive open space character of the east side of the Parkway (see Visual Resources section of this EIR).

Land Use Impacts and Issues Related to Lakeborough

The proposed Lakeborough project is in the planning stages and has not yet been considered by the County. However, due to its scale and location, it is appropriate to analyze Phase 1 in context with Lakeborough, assuming the Lakeborough plan is adopted and developed.

As with Phase 1, the Lakeborough Specific Plan would require development of some rangeland in the Diablo Range. The Lakeborough Specific Plan is designed to attract wage-earning families and a commuter community, whereas the Diablo Grande project is geared towards retirement age homeowners and a resort atmosphere. Lakeborough would have more developed community services such as schools, while Diablo Grande focuses on recreational facilities.

The two projects would be sufficiently distant to prevent competition for local commercial services, such as supermarkets, pharmacies and gas stations. Some regional commercial activities may directly compete; both projects would offer recreational facilities, such as golf courses and swim and tennis clubs, and Lakeborough plans a regional shopping mall, while Diablo Grande proposes primarily neighborhood shopping and resort oriented shops. Both projects are a response to growth trends in, and outside of, the County, and would be competing in part for home buyers, commercial tenants, and other patrons.

Wildfire Hazard

The introduction of resident and visitor population in Village 1 would unavoidably increase potential for wildfire. Human activity is responsible for the start of approximately 95 percent of all wildfires. (Chief Athey, pers. comm.) Although much of the wildfire fuels would be modified or removed for development, man-made structures would provide a new fuel source. Grasslands left as open space may not be grazed by cattle at buildout, and represent a additional fuel source.

The project includes fire prevention efforts such as a fuel reduction plan (FRP), man-made improvements such as roads designed to create fire breaks, and local fire safety response facilities.

An FRP would help to reduce wildfire hazard resulting from overgrown grasslands and other open spaces. If comprehensive in approach, fire prevention measures would reduce the increase in wildfire hazard generated by the project to acceptable levels of risk.

Hazardous Materials and Waste

The site contains no known significant hazardous waste or material. Although a site assessment has not been conducted to confirm that no hazardous materials exist on the site, the site has historically been used for cattle grazing, an activity which neither generates nor uses hazardous materials.

Phase 1 development would result in the presence of hazardous materials on-site. In addition to materials and waste from initial construction, operations of project facilities would including:

- fertilizers, pesticides and herbicides to maintain golf courses and residential lawns;
- domestic cleaning solutions and septic systems;
- underground storage of oils and solvents to supply service vehicles and maintenance equipment;
- chemicals for the waste water treatment plant.

Improper use, storage and disposal of these materials could result in contamination of groundwater and soil, thereby affecting biology and project inhabitants. Following local and federal guidelines regarding these materials would help to prevent impacts from hazardous material contamination.

Phase 1 Development Conclusions of Significance

No significant conflicts are anticipated from the proposed mixture of land uses. Phase 1 development would introduce a ratio of population and employment opportunities that can be characterized as balanced.

Although the loss of ranching activities in Phase 1 would not be considered to be significant, termination of overall site ranching activity which, without mitigation, would be likely with the removal of the Oak Flat Ranch facilities during Phase 1 development, could be reasonably considered significant.

Upgrading of Oak Flat Road could lead to future off-site development between Phase 1 and I-5. This land use growth inducement potential is considered an unavoidable significant impact of the project. Specific impacts of future off-site development would be addressed in specific environmental review of those projects.

The Phase 1 project's impact of loss of County open space is considered significant without mitigation.

Overall Site

Population and Employment Issues

Table IV.A-D: "Overall Site Residences, Population and Resident Wage-earners, Excluding Phase 1", summarizes the proposed housing types, and population projections and profiles for the overall site, excluding Phase 1.

The overall project is proposed to include 3,035 households, with a density variation of 15 percent, or total units between 2,580 and 3,490. Assuming a build-out of 3,035 units, 1,990 units would be detached single family, 415 attached single family and 630 multiple family.

The resident profiles for the overall site would be the same as Phase 1, in terms of the number of residents and wage-earners per household, and would include approximately 2,438 (1,505 in Phases II-IV) wage-earners.

Employment Opportunities

Overall site construction generated economic activity would continue through site build-out, which is projected to be completed in 2020. The build-out schedule would likely vary depending on future demographic shifts and real estate market conditions.

Long-term project-dependent economic activity would be similar to that created by the Phase 1 development. While the Phase 1 development included 867 jobs from 51 acres of employment land uses for 1,965 residential units, the overall site development would include 13 additional acres of employment land uses, generating 220 jobs, at 17 jobs/acre, for 3,035 residential units, and 450 jobs in the entry area. Another 370 home-occupation jobs are projected in the traffic study, resulting in a project total of about 1,900 on-site jobs.

Development Impacts to County Agricultural Land Resources

Impacts to Rangeland and Ranching. Cattle ranching exists periodically on 80 percent of the site, which equals 23,600 acres including Phase 1 and represents approximately 6.5 percent of the 359,000 acres of non-irrigated rangeland in Stanislaus County. The project site would be incrementally removed from Williamson Act participation as development occurs. Development of the overall site would mean converting all non-irrigated rangeland on the site to residential, commercial and open space uses and would be an unavoidable long-term adverse impact to range land in the County.

Table IV.A-D
Overall Site Residences, Population and Wage-earners

Unit Type	Resident Type	Number Of Units (1)	Percentage Unit Type (2)	Number of Households (3)	Number of Residents (4)	Number of Wage-earners (5)
Single Family Detached	Permanent	NA	51.4	NA	NA	NA
	Seasonal	NA	10.0	NA	NA	NA
	Retirement	NA	38.6	NA	NA	NA
Single Family Attached	Permanent	NA	40.7	NA	NA	NA
	Seasonal	NA	13.0	NA	NA	NA
	Retirement	NA	46.3	NA	NA	NA
Multiple Family	Permanent	NA	28.0	NA	NA	NA
	Seasonal	NA	24.0	NA	NA	NA
	Retirement	NA	48.0	NA	NA	NA
Totals				NA	NA	NA

Assumptions

- Employable residents per permanent household:	1.1
- Employable residents per retirement and seasonal household:	0.0
- residents per single family detached household:	3.1
- residents per single family attached household:	2.3
- residents per multiple family attached household:	1.8
- retirement residences have 20 percent fewer residents per household	

Notes:
(1) Derived from Land Use Plan
(2) Derived from Marketing Plan
(3) Derived by multiplying the Number of Units by the Percentage of Unit Type
(4) Derived by multiplying the Number of Households by the number of residents per unit type
(5) Derived by multiplying the Number of Households by the number of wage-earners per unit type

Prime Farmland Impacts. Growth is expected to continue at current levels through the projected build-out of much of the overall site. As an alternative location for development, the overall site would partially mitigate countywide growth impacts by directing growth away from the prime-farmland in San Joaquin Valley.

Growth Inducement Issues and Impacts

Development of the overall site would result in the following growth-inducing factors:

- Additional inducement for residential and visitor populations to immigrate;
- The inventory of county land committed to future development would be increased;
- Phase 1 infrastructure would be expanded to support the overall site, thereby potentially inviting future additional development;
- The customer base would grow in conjunction with population immigration and provide added incentive for commercial development.

Essentially, Phase 1 development would initiate population to the area, while the overall site development would encourage a continuation of resident immigration.

It is unknown whether overall site development's expansion of the County's inventory of developable land would induce greater county-wide population growth. Growth on the site may reduce pressures for development in other County locations, thereby mitigating adverse impacts of development in prime-farmland regions.

Previous Phase 1 site development would result in the development of improvements such as facilities and infrastructure improvements. The overall site development would include expansion of this infrastructure, which could induce additional growth. Limiting the excess capacity and preventing development of land serviceable by improvements would potentially mitigate the potential adverse growth-inducing impact of improvements.

As the population of the project expands, the consumer base would increase to invite further commercial growth, particularly along Oak Flat Road. However, these potential impacts may be mitigated by restrictions to development, and by County and public review.

Open Space Issues

Impacts to Countywide Open Space Lands. The proposed project would result in the conversion of much of the entire site from open space and agricultural uses to developed uses. Alhough approximately 12,700 acres

would remain Conservation Area open space, there would be the conversion of 10,200 acres to residential uses, 66 acres to employment uses, and 500 acres of road uses. The 6,000 acres converted to open space recreational areas would be lost to agriculture and would be of a more suburban recreational character (i.e., golf). In addition, the estate lots in the Conservation Areas would reduce their open space values. More than 4,800 acres would be retained as hill and creek conservation areas within the five villages. The development of the Phase 1 site, and accompanying improvements and population at the center of the overall site, would limit the value of the overall site acreage as undisturbed, undeveloped land. Still, converting the land to residential, commercial and open space uses would result in an unavoidable adverse impact to the County's inventory of open space.

A large percentage (up to 63 percent) of the overall site would be designated open space to offset the impact, but not to the point of non-significance. The designated open space lands would provide the same mitigation value as those noted in the Phase 1 development.

Impacts of Estates on Open Space. The estates proposed as part of overall site development would adversely impact the mitigation value of Conservation Areas and can be considered an unavoidable impact.

Overall Site Wildfire Hazard

Overall site fire hazard conditions are similar in character as the Phase 1 site. Because overall site development would be similar in character as Phase 1, the risk of wildfire hazard after development would be increased on-site in a manner similar to Phase 1.

Overall Hazardous Materials

No hazardous materials are known to exist on the overall site and, for the reasons cited for Phase 1, it is possible but unlikely that any hazardous materials of significance would be uncovered during construction.

Overall Site Development Conclusions of Significance

The mixture of land uses would result in no significant impacts from conflicting land uses. Site development would result in a job/residents ratio that can be characterized as balanced.

The termination of ranching activities in the overall site could reasonably be considered a significant impact. However, the impact can be partially mitigated by continuing to graze cattle through the 25-year build-out of the

overall site. To further mitigate the loss of rangeland, it may be reasonable to continue grazing in the Conservation Areas of the site after project build-out.

Upgrading of Oak Flat Road could lead to future off-site development adjacent to the road. Growth inducement potential is considered a significant impact of the project. Development would result in a new population, and road and infrastructure improvements, which would likely induce growth.

Assuming Phase 1 is developed in the manner proposed, the overall site would be developed in an area already disturbed by Phase 1 development. However, the overall project's impact on open space would still be significant.

Mitigation Measures

Phase 1

1. Continuance of limited grazing on the site shall be considered to help offset impacts due to the termination of Oak Flat ranch facilities in Phase 1. To the satisfaction of the Planning Director, during development of Phase 1 the applicant shall develop a program for maintaining limited grazing in the overall site.

2. Off-site growth inducement along Oak Flat Road shall be mitigated by requiring scenic easements or other vehicles for the maintenance of open space/agricultural uses adjacent to the road. Careful public and County review shall be conducted for any proposed development along Oak Flat Road.

3. To mitigate open space and agricultural land use impacts, minimal housing development shall be allowed in the proposed hill Conservation Areas along cul-de-sac areas east of Oak Flat Parkway.

4. To ensure open space lands remain in open space in perpetuity, scenic or open space easements shall be established for open space areas. If easements are not possible, the lands may be conveyed to the County or a deed restriction may be implemented.

5. A geotechnical survey and records search shall be conducted to confirm the absence of hazardous wastes on the Phase 1 site prior to Final Map approval.

Significance of Land Use Impacts of Phase 1 After Mitigation

Impacts to the County's inventories of existing ranching activities/rangeland/ agricultural preserves are considered unavoidable and significant. Growth-inducing impacts, particularly along Oak Flat Road at off-site locations, would be mitigable to the point of non-significance if easements are employed.

Overall Site Development

1. If the Phase 1 mitigation for installing a viable grazing program is successfully implemented, it shall be reviewed and modified as feasible to allow some continuation of viable grazing during the post-development of the overall site.

2. Off-site growth inducement along Oak Flat Road shall be mitigated by requiring the maintenance of open space/agricultural uses adjacent to the road in perpetuity. Careful public and County review shall be conducted for any proposed development along Oak Flat Road.

3. To ensure open space lands remain open space, scenic or open space easements shall be established in the manner described in Phase 1 Mitigation Measures.

4. A geotechnical survey and records search shall be conducted to confirm the absence of hazardous wastes on the Phase 1 site.

Significance of Land Use Impacts of Overall Site After Mitigation

As in Phase 1, the loss of ranching activities/rangeland/agricultural preserves would be mitigated to the lowest extent possible but not to the point of non-significance. Growth-inducing impacts would be mitigated to the point of non-significance.

B. GEOLOGY, SEISMICITY, AND SOILS

Setting

Regional Geology

The site is located at the boundary between the Coast Ranges Geomorphic Province to the west, and the Great Valley Geomorphic Province to the east. The Coast Ranges in this area are underlain by a thick sequence of sedimentary and volcanic rocks ranging in age from Jurassic (180 million years ago) to recent (10,000 years ago and less). The older (over 125 million years old) rocks consist primarily of marine sandstone, mudstone and conglomerate deposited on ancient oceanic crust. Late Miocene (13 to 25 million years ago) and younger deposits consist mainly of conglomerate, sandstone and mudstone deposited mainly within a marginal marine or continental setting.

Tectonic deformations from the opposing crustal forces of the northwest-moving Pacific plate and the southeast-moving North American plate have occurred several times since the Jurassic, producing the northwest-trending folds and faults characteristic of the California Coast Ranges.

The Great Valley, including the Sacramento Valley in the north and the San Joaquin Valley in the south, is a structural down-warp filled with sediments ranging from Jurassic to Recent in age. The sedimentary rocks that underlie the valley are generally similar to and contiguous with rocks exposed in the Coast Ranges to the west. Along the western flank of the valley a thick section of these rocks crop out extensively and dip generally eastward.

Regional Seismicity

The site area lies along the contact between two dissimilar seismic regions, the Coast Ranges and the Great Valley. The Coast Ranges are cut by numerous active faults generally assigned to the active San Andreas fault system. Many small to moderate earthquakes occur throughout the region every year. Several large earthquakes have occurred during historical times. Movement on active faults within the central Coast Ranges is generally right-lateral in orientation (the western block moving northward with respect to the eastern block). Lateral offsets of up to several feet have occurred during large earthquakes. In contrast, the Great Valley is a region of low seismic activity and few active faults.

The principle active faults of the region are the San Andreas, Hayward, and Calaveras located 38, 23, and 22 miles west of the site, respectively (see Figure B-1: Regional Seismicity). Faults which have had surface displacement within Holocene times (to 10,000 years before present) are considered to be active.

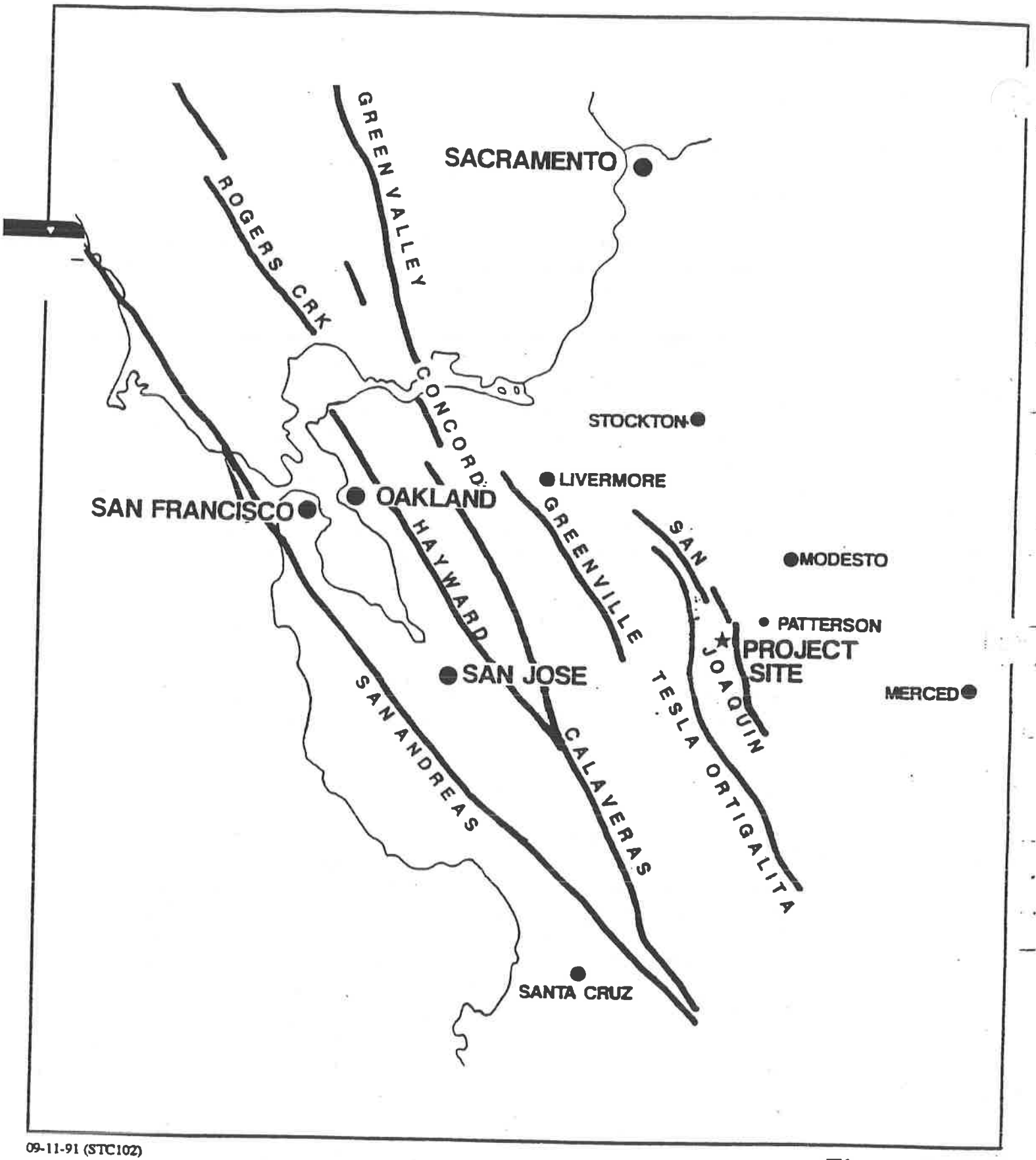

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Figure IV.B

N

LSA

Scale in miles

0 10 20

Major Fault Zone

Regional Seismicity

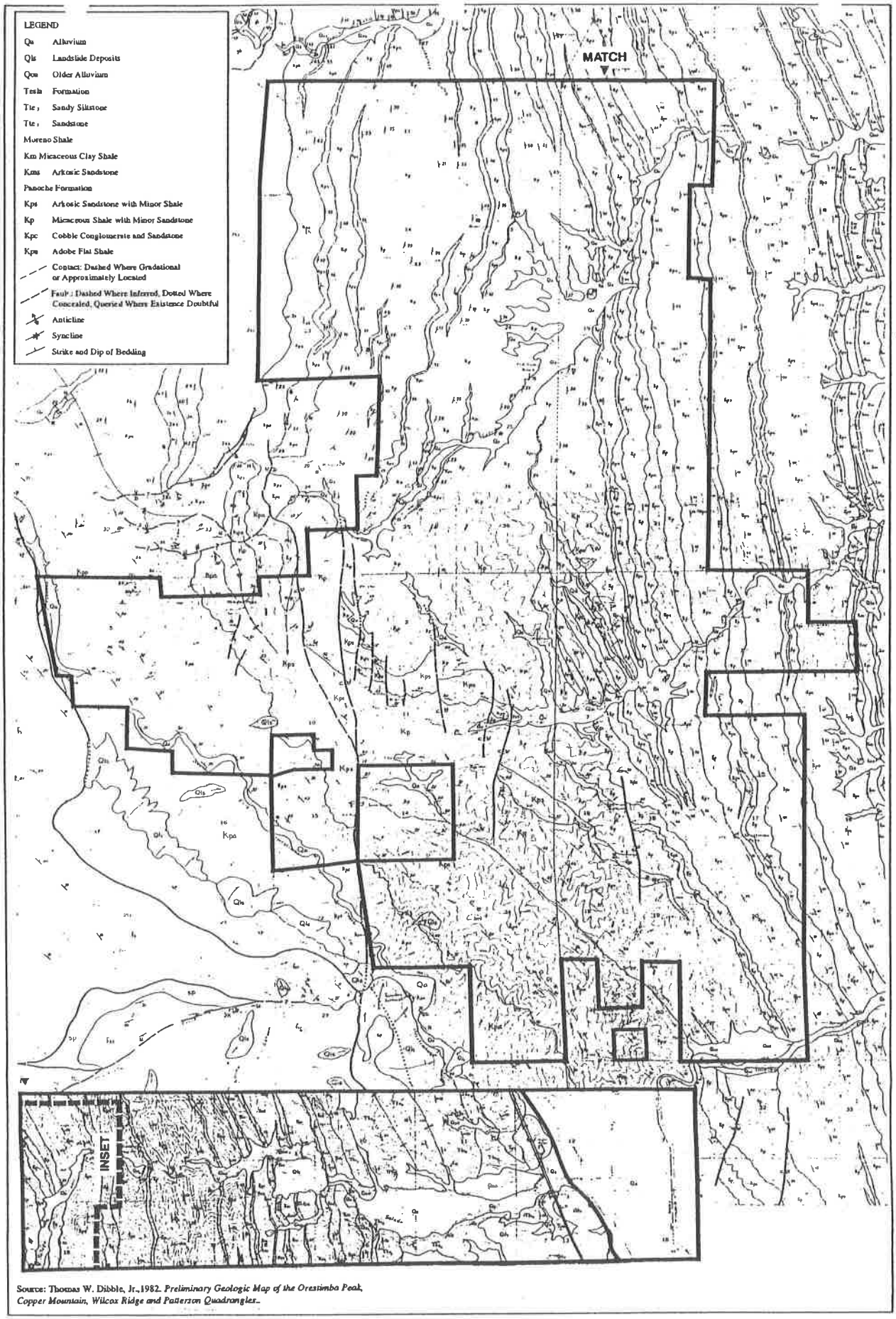
Information furnished by the State Department of Mines and Geology and the State Office of Emergency Services indicates that ground shaking along these faults can produce damage within the County to reach varying intensities. The western half of the County can expect to receive shaking to an intensity of VII or VIII on the Modified Mercalli Intensity Scale which can cause considerable damage to ordinary structures. The area around the City of Newman may have shaking intensity of IX or X. This region is considered a major hazard area (Stanislaus County General Plan, Safety Element, 1987). Secondary seismic hazards such as liquefaction (the total loss of shear strength experienced by loose, saturated, cohesionless soils subjected to stresses induced during earthquake ground shaking) is likely to occur within the low-lying sandy areas of the San Joaquin valley and along drainages, especially during winter and spring when groundwater levels are at their highest. Earthquakes can induce landsliding along steep slopes and cause dams to fail, resulting in inundation of low-lying areas.

Overall Site

Geology

The 29,500-acre Diablo Grande project site lies approximately five miles west of Interstate Highway 5 in Southwestern Stanislaus County. Three main water courses traverse the project area: Salado Creek, Crow Creek, and Orestimba Creek. Salado and Crow creeks traverse the project site from the vicinity of Mikes Peak along the western boundary of the site northeast and east, respectively, toward I-5. Orestimba Creek traverses the southwestern and southern boundary line as it flows eastward. The higher elevation areas within the project site include the following: Wilcox Ridge, along the southwest boundary, at 2,225 feet above mean sea level (msl); Mikes Peak, just north of Wilcox Ridge, at 2,620 feet msl; Copper Mountain, in the northwest corner of the project site, at 2,678 feet msl; and Orestimba Peak, in the southeast corner of the site, at 2,014 feet msl. The Oak Flat Road access to the site ranges in elevation from 250 to 700 feet msl.

The predominant structural geologic feature in the study area is a homocline (a series of beds dipping at approximately the same angle of inclination from the horizontal over a relatively small area extent, in this case, a few miles)(see Figure IV.B-2 Project Site Geology). The axis of the homocline (anticline) is located approximately one mile east of the north fork of Orestimba Creek. Beds generally dip to the east at angles of 15 to 55 degrees from the horizontal; the steepness of the bedding increases generally from west to east. Folds in the area trend approximately northwest-southeast, with the exception of the curvilinear Tesla-Ortigalita fault complex (northwest of the study area) which represents the boundary between the Franciscan formation to the west and the younger sedimentary locales to the east (Bishop, 1970).



Source: Thomas W. Dibble, Jr., 1982. *Preliminary Geologic Map of the Orestimba Peak, Copper Mountain, Wilcox Ridge and Patterson Quadrangles.*

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Figure IV.B-2

N

Scale in Miles

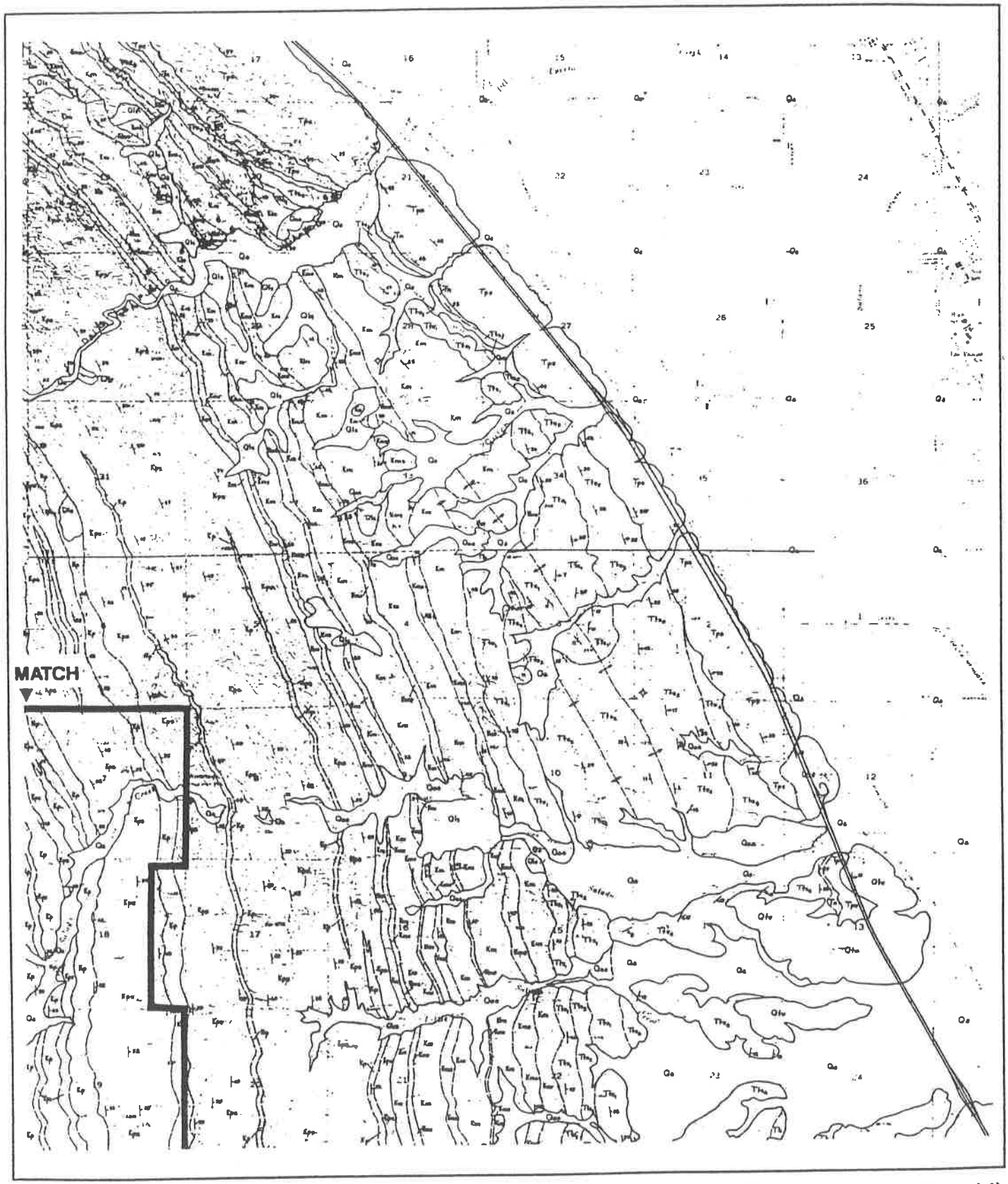

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Figure IV.B-2 (Cont'd)

N

Scale in Miles

The oldest rock exposed within the project site is the Del Puerto Keratophyre (geologic map symbol Jkr). This rock is part of the Ophiolite complex of the Coast Ranges and consists of lavas and crystalline dike rocks. The unit crops out along the western boundary of the property, along Copper Mountain, and is of Jurassic geologic age (180,000,000 to 135,000,000 years ago). The majority of rocks within the project site are the conglomerate, sandstone, and shale units of the Upper Cretaceous (135,000,000 - 63,000,000 years ago) Panoche formation. The oldest rocks of the Panoche formation are found in the western portion of the site and become increasingly younger and more interbedded toward the east (see Figure IV.B-2: Site Geology) (USGS, Open-file report 82-394, 1982).

The Panoche formation in the study area suggests a depositional environment which was stable over fairly long periods of time, but which was interrupted by local tectonic events. The cobble conglomerates and sandstones of the Panoche formation (map symbol Kpc) consist of gravel and conglomerate interbedded with fine and very coarse grained sandstone. The unit appears to represent fill of a submarine channel of deposition in a topographic low (Bishop, 1970). The Kpc unit is only present within the vicinity of Mike's Peak in small outcrops. The Adobe Flat shale of the Panoche formation (maps unit Kpa) occurs in a widespread area within the westernmost portion of the site, south of Mike's Peak and consists of thinly-bedded clay shale which commonly contains calcareous concretions and lenses of impure limestone. Thin, fine-grained silty sandstone interbeds occur near the base. Petrified wood is associated with the sandstone zones and carbonaceous material occurs in the shale (Bishop 1970). The Arkosic sandstones of the Panoche formation (map symbol Kps) consist of fine grained, silty to clayey arkosic sandstone, commonly with calcareous concretions ranging from an inch or two to a foot or more in diameter (Bishop, 1970). In general, sandstone bodies increase and shale interbeds decrease upsection toward the top of the Panoche formation. Sedimentary structure in the sand bodies suggest turbidite deposition (Bishop, 1970). The Kps unit comprises the majority of the Wilcox Ridge and the southern portion of the site and occurs as linear banding between more recent units further east. The Micaceous shale of the Panoche formation (map symbol Kp) consists primarily of thinly bedded, commonly carbonaceous, gray to brown siltstone and claystone with some fine grained silty sandstone (Bishop, 1970). Some sandstone and conglomeratic units in the area may constitute topographic and channel-fill bodies which are probably not continuous over significant distances. The Kp unit occurs in widespread areas in the central and northern areas of the site and as linear banded outcrops further east.

Discontinuous lenses are particularly prevalent in the lower Panoche formation. As the sandstone content of the lithologic units increases into the upper Panoche formation, the sand bodies display a more continuous character. The Upper Panoche formation occurs up to a mile and one-half east of the Diablo Grande Project site, on both sides of Oak Flat Road. The

geologic unit occurring along the next mile of Oak Flat Road consists of interbanded micaceous clay shale (Km) and arkosic sandstone (Kms) of the Moreno formation. Between the Moreno formation and I-5 are siltstone (Tte_2) and sandstone (Tte_1) units of the Tesla formation. The Tesla formation was deposited in marine and possibly brackish environments of Eocene (36 to 58 million years) age. The proposed Primary Access Road traverses in a north-south direction, through the Tesla formation.

The youngest deposits represented in the project are the Pleistocene and Holocene-age (500,000 years ago to present) Alluvium of Patterson and San Luis Ranch (undivided) which underlies the low-lying areas within the major canyons, Salado Creek and its tributaries. These unconsolidated deposits consist mainly of gravel and sand with lesser amounts of clay and form well-developed alluvial aprons which extend eastward into the valley.

There are no mineral resource mines within the Diablo Grande project site. Within Del Puerto Canyon, northwest of the site, are several chromite, magnesite, and cinnabar mines. Asbestos, a mineral naturally occurring within serpentine units, is also not expected to be present within the project site because surficial mapping indicates an absence of serpentine. Small serpentine outcrops are, however, found west of the site, opposite Orestimba Creek Canyon.

Geologic Hazards

According to the Stanislaus General Plan Safety Element (June 1987), the area west of I-5 (Diablo Range) is noted for unstable geologic formations that are susceptible to landsliding. However, according to the preliminary geologic maps of the Patterson, Copper Mountain, Orestimba Peak, and Wilcox Ridge quadrangles (USGS 1982), only two localized areas of slope instability occur on the site. Both of the landslide deposits are within the southwestern corner of the project area, along the western flank of Wilcox Ridge. Extensive landslides, however, have been mapped just outside this project boundary line, on the western side of Orestimba Creek, between Knoxville and Panoche formations. Localized areas of landslide activity have also been mapped outside the project area to the north, along Del Puerto Creek, and to the east, along Crow Creek. Proposed Villages 3, 4, and 5 contain the steepest, most potentially unstable slopes within the project site.

Seismicity

The active faults in proximity to the site include the Green Valley fault and the Tesla-Ortigalita fault. The Green Valley fault is located nine miles to the west of the project site. Splays of the Tesla-Ortigalita fault traverse along the western flank of Wilcox Ridge and through the proposed Village 3. The main

Phase 1

Geology

A geologic map of the Phase 1 area was prepared by Richard Slade in 1989, as part of the Hydrogeologic Feasibility Study for Groundwater Development on the Diablo Grande Project Site. Information for this map was derived primarily from the 1982 field mapping by Dibblee, with correlation to, and minor revisions from, the 1970 mapping by Bishop. The description of the Phase 1 geology is the same as provided under the overall site geology discussion. As shown in Figure IV.B-4: Phase 1 Geology, the majority of the rock unit within Phase 1 is sandstone and shale (map symbol Kp) of the Panoche formation. Minor beds of arkosic sandstone (map symbol Kps) and conglomerate (Kc) occur within the Kp unit. As shown in Figure IV.B-2, the Oak Flat Parkway traverses through both the Panoche units along its western half and through micaceous clay shale (Km) and arkosic sandstone (Kms) units of the Moreno formation along its eastern half. Alluvium covers the low-lying areas along Salado Creek and its tributary drainages.

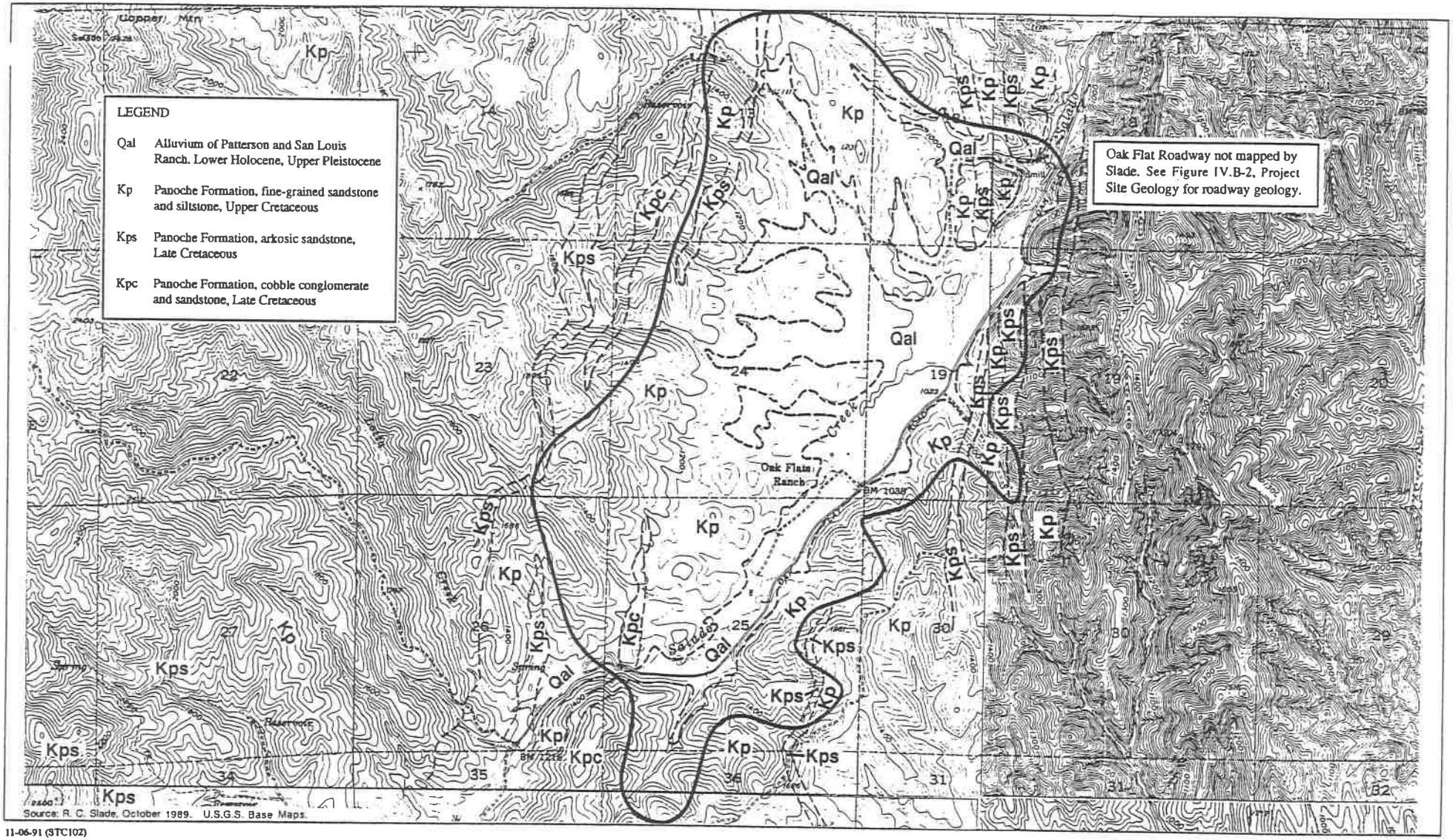
Geologic Hazards (Erosion/Slope Instability)

Elevations on the Phase 1 property range from approximately 1,600 feet in the Copper Mountain area in the northwestern corner of the Phase 1 site, to 900 feet in the portion of Salado Creek located near the northeastern boundary of the Phase 1 site.

According the USGS Geologic Map of the East Flank of Diablo Range, no landslides are mapped within the Phase 1 area. Approximately four miles east of the site, along the proposed right-of-way, is a large landslide, probably of Holocene movement. The site reconnaissance indicated isolated areas of landsliding and slope instability (i.e., creep, rilling and rock-falling) on slopes adjacent to the steep cliffs along the lower section of the proposed Oak Flat Parkway. Because the site soils are shallow, landsliding on the Phase 1 site is not extensive. Various degrees of bank and channel erosion are seen along the course of Salado Creek.

Seismicity

The general description of Phase 1 seismicity and related seismic hazards is the same as provided under the overall site seismicity discussion. Although no fault traces traverse the Phase 1 area, it could be subject to strong ground shaking and earthquake-induced landsliding along the steep foothills along the southern project boundary and along the steep creek banks. The potential for



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LSA

Scale in feet
0 1000 2000

Figure IV.B-4

Phase 1 Geology

trace of Tesla-Ortigalita fault lies approximately one-half mile from the westernmost project boundary. The most recent movements with surface faulting within the Diablo Range were along the Tesla-Ortigalita fault approximately five million years ago, although earthquake activity without surface fracturing or faulting is still common. Since 1930, one earthquake epicenter of a magnitude greater than 4.0 on the Richter Scale was recorded in Stanislaus County. On June 27, 1986 an earthquake with a magnitude of 3.7 on the Richter Scale occurred with an epicenter several miles west of Crows Landing, within the vicinity of the project site. Future earthquakes of similar or greater magnitudes can be expected (Stanislaus County General Plan, 1987).

The Tesla-Ortigalita fault, a system of right-lateral strike slip faults, is the closest known active fault to the site (with splays crossing the site). Much of the fault is within an Alquist-Priolo Special Studies Zone. The fault splays which cross the site are not within an Alquist-Priolo Special Studies Zone. Previous investigations have suggested a maximum credible earthquake (MCE) of Richter Magnitude 6.75 for this fault with an overall recurrence interval of 2,000 to 5,000 years (WESCO, 1990).

The Greenville fault is a northwest-trending, right-lateral, strike slop fault that has experienced moderate earthquakes during historical times. A magnitude 5.9 event, accompanied by surface rupture, occurred along the fault near Livermore in 1980. The portion of the fault closest to the site is considered to have an MCE of 6.5 with a recurrence interval of 1,200 years (WESCO, 1990).

The San Joaquin fault, located approximately four miles east of the project site, is an en-echelon system (an overlapping or staggered arrangement of faults that form a linear zone) which trends northwestward along the western margin of the San Joaquin Valley. Movement along this fault system is dominantly vertical (east side down) but may also be, in part, right lateral. The southern extension of one of these traces is near Oak Flat Road, about 0.5 mile west of Highway 5.

Harding Lawson Associates (HLA, 1989) conducted a geologic reconnaissance of the northern projection of this fault trace, near Del Puerto Canyon (four miles northeast of the project site). A well-defined lineament was noted between a conglomerate and alluvium deposit. However, since no offset was apparent, HLA could not conclude that the observed lineament was fault-related.

The San Joaquin Fault is overlain by unfaulted late Pleistocene age alluvium in several areas to the south of the site. This suggests that little if any activity has occurred on the fault in the last forty to sixty thousand years.

Soils

The Soil Conservation Service has recently mapped soils within the Diablo Grande project site vicinity. As indicated on Figure IV.B-3: Diablo Grande Project Site Soils, all but the southeastern corner of the project area has been mapped. The Soil Conservation Service (SCS) has prepared a preliminary soil description data base. Those soils that have not been encountered in sufficient enough acreage will be described in future renditions (SCS, July, 1991).

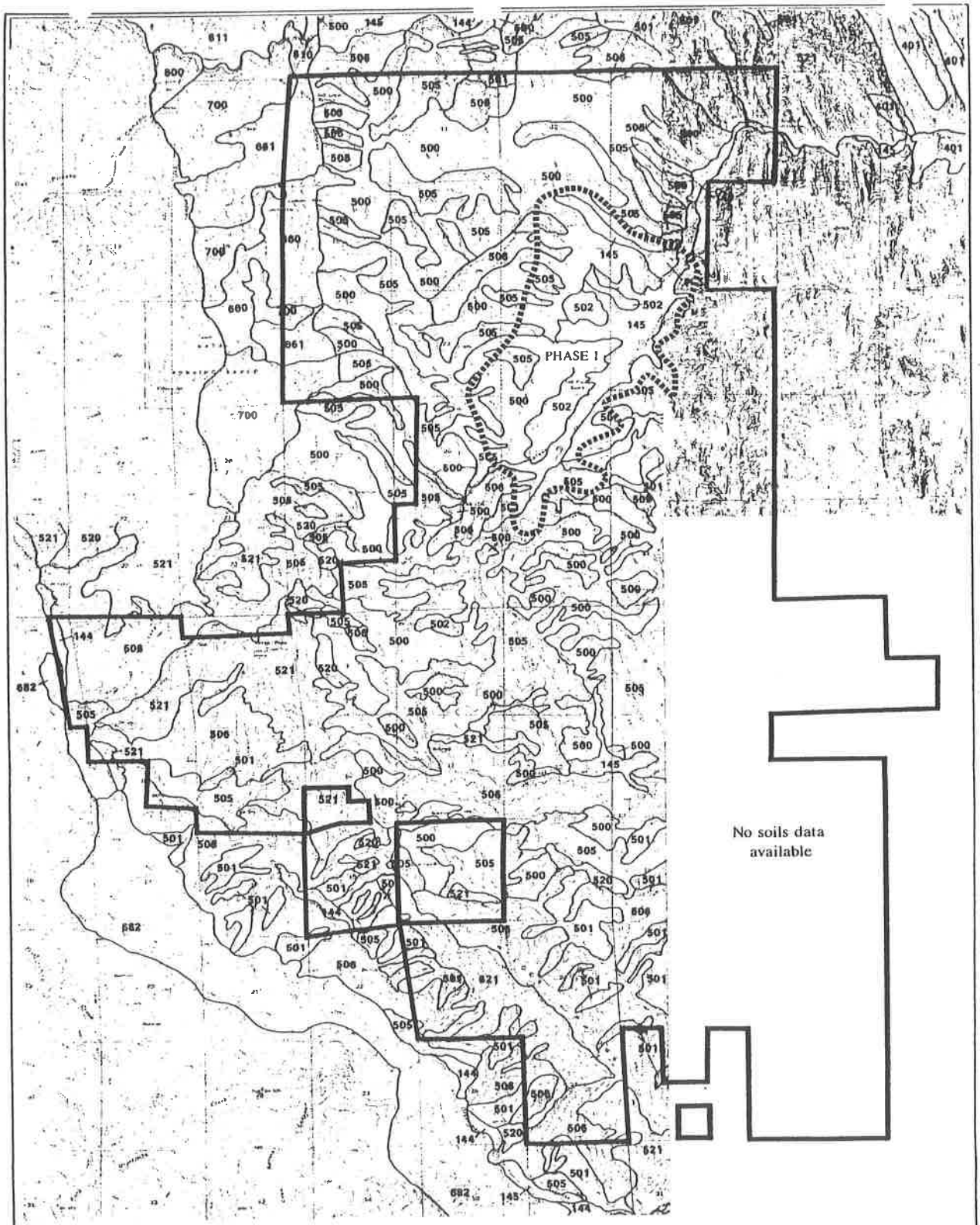
According to the preliminary soils information, there are 16 major soil types within the Diablo Grande project site. These soils consist of loams, gravelly loams, sandy loams, and clay loams. Many of these soils are complexes, where soil units are so intermingled that it was not practical to map them separately. A complete description of these soil characteristics is provided in Table IV.B-A: Diablo Grande Project Area Soils.

The majority of soils represented in the proposed Village 1 area include the Arbura-Contra Costa-Wisflat and Wisflat-Arburua-San Timoteo complexes of 30 to 50 percent slopes, and Zacharias clay loam of 2 to 5 percent slopes. The soil complexes were derived from sandstone and vary from shallow or moderately deep. They are well-drained to somewhat excessively drained. Permeability varies from slow in the clay loams to moderately rapid in the sandy loams. Surface runoff rates are rapid and the potential for water erosion is severe. The shrink-swell potential is low in the sandy loams, and moderate to high in the loam and clay loams. Zacharias clay loam covers the low-lying areas along Salado Creek. The soil is very deep, well drained, and has a moderately slow permeability, slow surface runoff, moderate shrink-swell potential, and a slight erosion hazard potential.

The Arburua-Contra Costa-Wisflat complex of 30 to 50 percent slopes, as previously described under Village 1, comprises the majority of soils in Village 2 and Village 4.

Rock outcrop-Wisflat complex of 50 to 75 percent slopes comprises the majority of Village 3, west of Mikes Peak. Large outcrops of sandstone and shale occur with Wisflat sandy loam in this area. The soil is shallow, well drained, with moderately rapid permeability and surface runoff rates. The erosion hazard of water is severe. The potential for shrink-swell is low.

Soil mapped along the eastern flank of Wilcox Ridge and the western half of Village 5 is from the Arburua-Contra Costa-Wisflat complex of 50 to 75 percent slopes. Soil depth ranges from shallow to moderately deep. The soil is well drained and has a slow to moderately rapid permeability and a very rapid surface runoff rate. The potential erosion hazard from water is very severe.



See Table 5.1 for Soil Descriptions

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Figure IV.B-3

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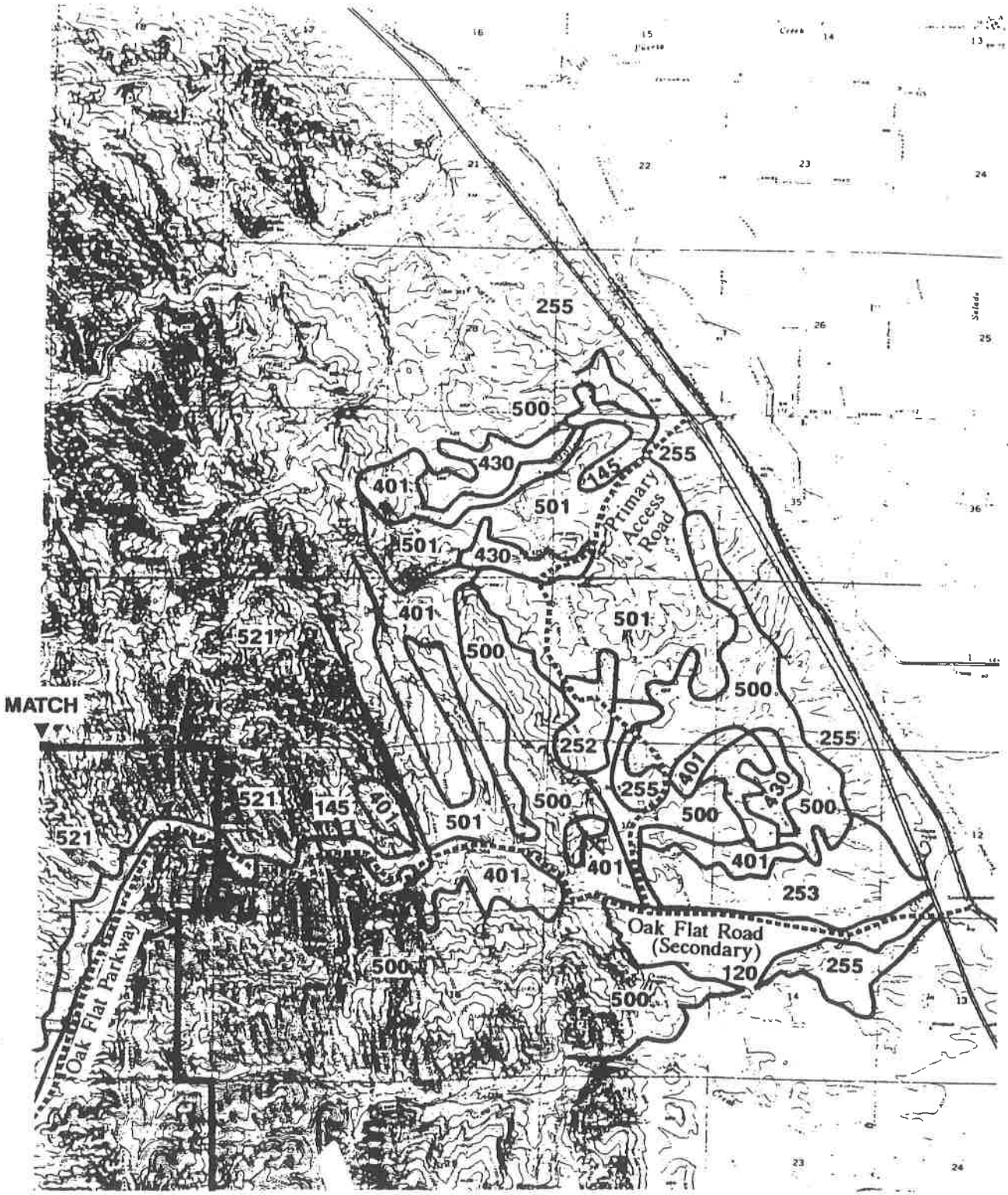

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Figure IV.B-3

N

LSA

Scale in Miles

Table IV.B-A - Diablo Grande Project Area Soils

Soil No.	Soil Type	Elevation and Landform	Depth to Bedrock	Depth to Water Table	Drainage	Perme-ability	Surface Runoff	Erosion Hazard	Shrink-Swell Potential	Corrosivity
120	Vernalis-Zacharias complex, 0 to 2% slopes	50'-300' alluvial fans								
	45% Vernalis clay loam		very deep	>5 ft.	good	moderate	slow	water=slight wind=slight	moderate	steel=high concrete=low
	40% Zacharias clay loam		very deep	>5 ft.	good	mod. slow	slow	water=slight wind=slight	moderate	steel=high concrete=low
145	Zacharias clay loam, 2-5% slope	200'-400' alluvial fans and low stream terraces	very deep	>6 ft.	good	mod. slow	slow	water=slight wind=slight	moderate	steel=high concrete=low
252	No official soil description on file									
253	Chaqua-Arburua complex, 8-15% slopes	400'-1,200' sideslopes and foothills								
	50% Chaqua loam		42" deep	>6 ft.	good	mod. slow	medium	water=moderate wind=slight	moderate	steel=moderate concrete=low
	35% Arburua clay loam		24" moderately deep	>6 ft.	good	moderate	medium	water=moderate wind=slight	moderate	steel=high concrete=low

Soil No.	Soil Type	Elevation and Landform	Depth to Bedrock	Depth to Water Table	Drainage	Perme-ability	Surface Runoff	Erosion Hazard	Shrink-Swell Potential	Corrosivity
255	No official soil description on file									
401	Alo-Vaquero complex	800'-1,600' mountains								
	45% Alo clay		35" moderately deep		good	slow	rapid	water=severe wind=slight	high	steel=high concrete=low
	40% Vaquero clay		35" moderately deep		good	slow	rapid	water=severe wind=slight	high	steel=high concrete=high
430	No official soil description on file									
500	Wisflat-Arburua-San Timoteo complex, 30-50% slope	500'-2,300' mountains								
	35% Wisflat sandy loam		11-14" shallow	>6 ft.	good	mod. rapid	rapid	water=severe wind=slight	low	steel=high concrete=low
	30% Arburua loam		22-24" mod. deep	>6 ft.	good	moderate	rapid	water=severe wind=slight	moderate	steel=high concrete=low
	20% San Timoteo sandy loam		26" mod. deep	>6 ft.	somewhat excessive	mod.rapid	rapid	water=severe wind=slight	low	steel=high concrete=low
501	Wisflat-Arburua-San Timoteo complex, 50-75% slope	500'-1,600' mountains								

Soil No.	Soil Type	Elevation and Landform	Depth to Bedrock	Depth to Water Table	Drainage	Perme-ability	Surface Runoff	Erosion Hazard	Shrink-Swell Potential	Corrosivity
	35% Wisflat sandy loam		10"-14" shallow	>6 ft.	good	mod.rapid	very rapid	water=very severe wind=slight	low	steel=high concrete=low
	30% Arburua loam		30" mod. deep	>6 ft.	good	moderate	very rapid	water=very severe wind=slight	moderate	steel=high concrete=low
	20% San Timoteo sandy loam		22" mod. deep	>6 ft.	good	moderate	very rapid	water=very severe wind=slight	low	steel=high concrete=low
502	Arburua-Wisflat complex, 0-15% slopes	1,000'-1,600' mountains								
	55% Arburua loam		22-25" moderately deep	>6 ft.	good	moderate	medium	water=moderate wind=slight	moderate	steel=high concrete=low
	25% Wisflat sandy loam		11-14" shallow	>6 ft.	good	mod.rapid	medium	water=moderate wind=slight	low	steel=high concrete=low
505	Arburua-Contra Costa-Wisflat complex, 30-50% slope	500'-2,300' mountains								
	35% Arburua clay loam		23-26" mod. deep	>6 ft.	good	moderate	rapid	water=severe wind=slight	moderate	steel=high concrete=low
	30% Contra Costa clay loam		38" mod. deep	>6 ft.	good	slow	rapid	water=severe wind=slight	high in subsoil	steel=moderate concrete=moderate

Soil No.	Soil Type	Elevation and Landform	Depth to Bedrock	Depth to Water Table	Drainage	Perme-ability	Surface Runoff	Erosion Hazard	Shrink-Swell Potential	Corrosivity
	25% Wisflat sandy loam		12" shallow	>6 ft.	good	mod.rapid	rapid	water=severe wind=slight	low	steel=high concrete=low
506	Arburua-Contra Costa-Wisflat complex, 50-75% slopes	500'-2,300' mountains								
	35% Arburua loam		22-25" mod. deep	>6 ft.	good	moderate	very rapid	water=very severe wind=slight	moderate	steel=high concrete=low
	30% Contra Costa clay loam		38" mod. deep	>6 ft.	good	slow	very rapid	water=very severe wind=slight	high in subsoil	steel=moderate concrete=moderate
	25% Wisflat sandy loam		13-15" shallow	>6 ft.	good	mod.rapid	very rapid	water=very severe wind=slight	low	steel=high concrete=low
521	Rock outcrop-Wisflat complex, 50-75% slopes	500'-1,600' mountains								
	55% Sandstone and shale outcrops									
	30% Wisflat sandy loam		13" shallow	>6 ft.	good	mod.rapid	very rapid	water=very severe wind=slight	low	steel=high concrete=low
660	Gaviota loam, 30-75% slopes	NA	shallow	NA	NA	NA	NA	NA	NA	NA

Soil No.	Soil Type	Elevation and Landform	Depth to Bedrock	Depth to Water Table	Drainage	Perme-ability	Surface Runoff	Erosion Hazard	Shrink-Swell Potential	Corrosivity
661	Gaviota gravelly loam, 30-75% slopes eroded	1,100'-3,800' mountains	17" shallow	>6 ft.	good	rapid	very rapid	water=very severe wind=slight	low	steel=moderate concrete=moderate
700	Hytop-Franciscan-Vallecitos complex, 50-75% slopes	1,000'-2,700' mountains								
	35% Hytop loam		39" mod. deep	>6 ft.	good	very slow	very rapid	water=very severe wind=slight	high in clay pan	steel=high concrete=low
	30% Franciscan loam		21" mod. deep	>6 ft.	good	mod. slow	very rapid	water=very severe wind=slight	moderate	steel=moderate concrete=low
	20% Vallecitos loam		12" shallow	>6 ft.	good	slow	very rapid	water=very severe wind=slight	high	steel=high concrete=low

A = Not available. In sufficient acreage of this soil mapped to determine its soil characteristics.

Shrink-swell potential ranges from low in the sandy loam, moderate in the loam, and high in the clay loam subsoil.

The majority of the soils within the northwest corner of the project site near the Copper Mountain Conservation Area include Gaviota loam and Gaviota gravelly loam of 30 to 75 percent slope, and the Hytop-Franciscan-Vallecitos complex of 50 to 75 percent slope. Gaviota soil is derived from sandstone and is shallow, well drained, and subject to very severe erosion from erosion. Permeability is rapid, surface runoff is very rapid, and the potential for shrink-swell is low. The Hytop-Franciscan-Vallecitos complex is derived from basalt, shale, and sandstone. It is moderately deep and well drained. The complex has a very slow to moderately slow permeability, very rapid runoff rate, and is subject to severe erosion by water. The potential for shrink-swell is moderate to high.

The soils in the northeastern portion of the site, in the Salado Conservation Area, include Arburua-Contra Costa-Wisflat complex of 50 to 75 percent slopes (previously described) and the Wisflat-Arburua-San Timoteo complex of 50 to 75 percent slopes. The later soil complex is shallow to moderately deep and is well drained to somewhat excessively drained. Soil permeability is moderate to moderately rapid. Surface runoff rates are very rapid and the potential for water erosion is very severe. Shrink-swell potential varies from low in the sandy loams to moderate in the loam.

Soils within the Wilcox Ridge Conservation Area in the southwest corner of the site include rock outcrop-Wilcox complex of 50 to 75 percent slopes (previously described) along the western flank of the ridge, and Arburua-Contra Costa-Wisflat complex of 50 to 75 percent slopes (previously described) along Orestimba Creek.

The soils within the Orestimba Conservation Area and the eastern half of Village 5 in the southeastern corner of the site have not been mapped.

All of the Diablo Grande soils have a depth to groundwater that is greater than six feet. With the exception of Zacharios clay loam along Salado Creek, most soils have an available water capacity that is low or very low. None of the soils have a potential for flooding. The soils are moderately to highly corrosive to steel and low to moderately corrosive to concrete. The capability class of the site soils is VIIe, which indicates soils where erosion severely limits the suitability for cultivation. See the Agriculture section for discussion of prime agricultural soils.

liquefaction exists within saturated alluvium deposits along Salado Creek and other tributary drainages.

Soils

According to the preliminary soil maps prepared by the U.S. Soil Conservation Service, there are approximately 10 soils within the Phase 1 area, which includes the Oak Flat Road Parkway (refer to Figure IV.B-2). A description of these soils' characteristics is provided within Table IV.B-A. An additional 50 soil borings were made throughout the proposed Village 1 area of Phase 1 for site-specific soil information within the various land use designations proposed.

Phase 1 and Parkway Soils

120 Vernalis-Zacharias complex; 0-2 percent slopes
145 Zacharias clay loam; 2-5 percent slopes
253 Chaqua-Arburua complex; 8-15 percent slopes
401 Alo-Vaquero complex; 30-50 percent slopes
500 Wisflat-Arburua-San Timoteo complex; 30-50 percent slopes
501 Widflat-Arburua-San Timoteo complex; 50-75 percent slopes
502 Arburua-Wisflat complex; 0-15 percent slopes
505 Arburua-Contra Costa-Wisflat complex; 30-50 percent slopes
506 Arburua-Contra Costa-Wisflat complex; 50-75 percent slopes

Zacharias clay loam occurs within low-lying areas along the length of Salado Creek where a variety of land uses are proposed, including parks, golf courses, medium and high density housing, vineyards, a research complex, town and shopping centers, and resort facilities. Arburua-Wisflat complex of 0-15 percent slopes, and Wisflat-Arburua-San Timoteo and Arburua-Contra Costa-Wisflat complexes of 30-50 percent slopes are found on either side of the low-lying areas, where golf courses and medium to low density housing are proposed. Arburua-Contra Costa-Wisflat and Wisflat-Arburua-San Timoteo complexes are found on the highest hillside areas to the north and to the south of Salado Creek, respectively, where low density housing is proposed.

Zacharias clay loam, Wisflat-Arburua-San Timoteo complex of 30-50 percent slopes, Rock outcrop-Wisflat complex of 50-75 percent slopes, and Wisflat-Arburua-San Timoteo of 50-75 percent slopes line most of Salado Creek along the proposed Oak Flat Parkway right-of-way within Phase 1.

Primary Access Road

Geology

The proposed primary access road traverses in a north-south direction through the medium to fine-grained sandstone (map symbol Tte_1) and the sandy siltstone (Tte_2) of the Tesla formation. Surficial alluvium deposits are mapped along the low-lying areas along northern and southern intermittent stream courses through which the Primary Access Road follows.

Geologic Hazards

The elevations along the proposed roadway range from 300 feet msl at the intersection for the Primary Access Road and I-5, 500 feet near central segment of the access road, and 250 feet msl near the intersection with Oak Flat Parkway. The highest elevations of the hillsides adjacent to the proposed corridor average approximately 700 feet msl to the east and up to 1100 feet msl to the west of the proposed road. There are no landslides mapped along this corridor.

Seismicity

The general description of the seismicity and related seismic hazards along the roadway would be the same as provided under the overall site seismicity discussion. No fault traces are mapped within the vicinity of the proposed roadway. The Oak Flat Parkway could be subject to strong ground shaking and earthquake-induced landsliding within the steep adjacent foothills. The potential for liquefaction exists within the saturated alluvium deposits of the intermittent drainages along the corridor.

Soils

The Oak Flat Parkway would traverse seven soils from the eastern boundary of Phase 1 to I-5. These soils include 145, 252, 253, 255, 430, 500, and 501. Refer to Table IV.B-A for a description of these soils.

Potential Impacts

Overall Site

Grading and Topographic Alterations

According to the grading policies contained in the Draft Specific Plan, the project would permit grading of less than 50 percent of the 29,500-acre site. Development is proposed for about 39 percent (or 11,500 acres) of the entire site. However, this developed area does include some ungraded acreage. The applicant's preliminary calculations indicate that approximately 20 percent of the total site would be graded. Grading would be necessary to construct the roadway cuts for the circulation system throughout the site and over steep hills to adjacent properties, to install utilities, and to provide level areas for golf courses, building pads, and foundations. The grading objective, as noted in the Specific Plan, is to minimize overall grading and to blend in finished grading of developable areas with the existing natural setting. Additional grading policies proposed include the recontouring or "feathering" of the final slopes, the minimization of tree removal, the use of minimum residential building pads and/or split level grading, and the balancing of grading on site within each phase of development. Although there is only project-design level site plans for only one of the five proposed villages, the preliminary Land Use Plan indicates that development could extend up into the 1,600- to 1,800-foot elevations. In addition, a limited number of estate lots within the higher elevations in the Conservation Areas would be allowed. The project would not affect the topography of the prominent peaks in the area. Due to the large scale of the project, extensive grading would be necessary and the potential impacts of site topography alterations and soil disruption, displacement, compaction, and overcovering, would be significant.

The unique rock outcrops in the Village 3 area and the rocks outcrops forming the cliffs near that area could be impacted as a result of project grading. Additional unique outcrops may occur elsewhere on the site and could also potentially be impacted. The project proposes to preserve the cliff areas and most of the Indian rocks areas as parks and golf courses. However, a small amount of rock outcrops in Village 1 would be in an area proposed for multiple family residential use. The project's potential impacts on unique geologic and/or topographic features in Villages 2 through 5 are unknown but could be significant.

Seismic Concerns

Strong seismic shaking from earthquakes generated anywhere within the San Francisco Bay area can be expected to occur during the life of the project. Seismic shaking can cause property damage, personal injuries from falling objects, and loss of life. The proximity of the site in relation to the Tesla-Ortigalita fault zone, one-half mile to the west, and the presence of fault splays within the southwestern corner of the site, increases the likelihood of project residences and structures being affected by the ground shaking should an earthquake be generated on this fault system. Proposed Village 3 and the western portions of Villages 4 and 5 could be subject to fault rupture which

would create additional hazards for residents and damage to structures and project improvements.

Seismic shaking can induce landsliding of unstable material and/or reactivate old areas of slope instability. Project structures built within areas of deep soils, steep gradients, and/or areas of previous landslides or structures and roadways built at the base of these potentially unstable areas, could become damaged or destroyed if not properly sited, engineered, and constructed. The two existing landslide areas on site are not within the village development areas. However, steep slopes occur throughout all villages and therefore the potential landslide hazards could be significant.

Project structures, utilities, and roadways constructed in alluvium deposits along Salado, Crow, or Orestimba creeks as well as other minor drainages could become serious damaged or destroyed due to the effects of liquefaction during a seismic event. Liquefaction hazards would be greatest in the winter and spring, when groundwater levels would be at their highest. This impact would be significant.

Erosion/Slope Instability

The primary soil impact on the project site development is the severe potential for erosion from rapid surface water runoff from the steep topography. The potential hazard from wind erosion is slight. Unless proper grading measures, erosion control plans, and drainage systems are incorporated into the project, development of the site could serve to worsen the effects erosion has on the landscape and the sediment-receiving stream bodies. Impervious surfaces from roadways, buildings, and parking areas would increase the amount of surface runoff within the project area by as much as 39 percent. This increased surface runoff could worsen the on-site rilling and gullying of slopes, and undercutting and sedimentation of streams. Increased erosion rates could undermine building and roadway foundations and cause incision in golf course areas.

As noted previously, structures located within areas of deep soil, steep gradients, and/or within areas of previous slope instability movement would be subject to the potential hazardous effects of landslides. In addition, development located at the base of ravines could be subject to debris slides or debris flows. A gradual loss of shear strength, or downslope creep, within loose material, saturation expansive soil, and/or weathered bedrock, could cause increased stress on building and roadway foundations. A more sudden loss of strength could result in roadway obstruction and possibly translocation of project buildings, roadways, and other improvements downslope. Development beneath these areas would also be subject to damage.

Expansive Soil

The project area soils' shrink-swell potential varies between soil types and even within mapped complexes, in which soils are intermingled. Site soils with moderate to high shrink-swell potential can crack foundations, roadways, and slabs-on-grade if not properly mitigated during project design, grading, and construction. As mentioned above, the presence of expansive soils upslope of proposed development could increase the likelihood of landslides. If adequate off-site slope buttressing and soil stabilization measures are not included within each village grading plan, this could represent a significant impact.

Soil Corrosivity

Project soils listed as having moderate to high corrosivity effects on steel or cement would particularly affect planning and design of foundations and buried utilities. The majority of project soils are classified as highly corrosive to steel and only slightly corrosive to cement. Unless properly mitigated by the time of utility installation, the effects of developing within an area of corrosive soil could result in extensive utilities maintenance.

Phase 1

Grading and Topographic Alterations

A preliminary grading plan for the Phase 1 Village 1 development was prepared in September 1991. The plan provides grading information for all proposed land uses except the detached single-family residences (in which only the lot lines in the immediate vicinity of the village are indicated). The preliminary grading plan shows the maximum credible slopes to be proposed through project grading, the worst case scenario. The preliminary plans involve the cutting and filling of roughly 2.5 million gross cubic yards. The grading is to be balanced within the Phase 1 area. Fill is to be divided equally between the east half at its Oak Flat golf course, and the west half and its Salado Creek golf course. The majority of fill is to be placed within the proposed polo center and single-family housing area along Salado Creek. Approximately 250,000 cubic yards of fill is to be placed within each golf course. Both residential and commercial land use areas would receive approximately one million cubic yards of fill. The proposed grading amounts would result in significant disruption, displacement, compaction, and overcovering of soils.

A typical cross section of the proposed Village 1 grading plan is provided in Figure IV.B-5. This section represents the area of most extensive grading activities, as it crosses one creek bed, one swale, and two knolls between

Salado Creek Circle and the ninth fairway of the Salado Creek golf course. In order to accommodate the proposed single family residences, the knoll south of the creek bed in the 14th fairway and Salado Creek Circle (elevation 1,220 feet msl) is to be cut up to approximately 35 feet. The swale directly east of this knoll (elevation 1,120 feet msl) is to be filled from 10 to 40 feet. The knoll directly east of the swale (elevation 1,170 feet msl) is to be cut by approximately 10 feet. The east-facing hillside directly adjacent to the ninth fairway of the Salado Creek golf course is to remain at its existing gradient. The proposed grading represented in this typical section would significantly alter the existing topography.

Additional Phase 1 grading would be necessary for development of the Oak Flat Parkway and the Oak Flat Road. However, the extent of this off-site grading is dependent upon the traffic expected to be generated as a result of the project, the development phasing, and the ability of the existing topography to accommodate the projected roadway size. Depending on the expectant traffic, the roadway may be two, three, or four lanes in sections to maintain approved traffic levels of service. Grading activities could include extensive hillside cutting and possibly streambed alterations in order to obtain the required roadway width. Although the extent is uncertain, the necessary access road grading could represent a significant alteration of topography and impact to slope instability. To lessen potential grading impacts, the project has stipulated on-site balanced grading, the incorporation of erosion control measures on exposed slopes, oak tree preservation to the extent feasible, project landscaping, and use of retaining walls where necessary.

Erosion and Slope Instability

The Preliminary Grading Plan indicates that the average maximum road slopes would be 20 percent. The areas in which the majority of these maximum slopes would be necessary are primarily along the northwestern and eastern slopes of Village I. Within the northwestern slopes, roads with gradients up to 18 percent are proposed along the ridge spurs up into the single family residential areas. Within localized areas on the eastern side of Salado Creek, hillside slopes would be cut to gradients of 30 to 50 percent (3:1 to 2:1) to accommodate attached single family residences and the equestrian staging area. Additional areas of moderately steep development slopes would be located within the single family lots north of the Oak Flat golf course and the attached single family housing area west of the Salado Creek golf course.

Grading necessary for the construction of the Oak Flat Parkway and Oak Flat Road may result in steep and potentially unstable slopes. Approximately three miles east of Village 1, the roadway passes through a large landslide area. Without proper engineering procedures, such as benched contours, adequate drainage, and erosion control measures, these proposed slopes could result

in significant erosion and slope instability impacts to an area which is already subject to landsliding hazards.

Seismic Concerns

The potential impacts to Phase 1 project development as a result of seismic activity along the nearby active faults in the San Joaquin Valley or San Francisco Bay Area would be the same as those cited under the overall site seismic concern discussion. The potential for surface rupture in the Phase 1 area, however, would be less likely because there are no mapped fault traces within this area. Fault activity outside the Phase 1 area could, however, affect the Village 1 improvements through strong ground shaking. The single family residences along the north and northwestern slopes of Phase 1 and the attached single family units at the base of the site's eastern slopes could be subject to seismically-induced landslides if adequate engineering procedures and erosion control measures were not incorporated into the project grading and building foundation plans.

The proposed Village 1 developments within the low-lying Salado Creek area, which includes structures such as the hotel/conference center, town and shopping centers, some lower elevation attached and detached single family residences, and associated roadway and utility improvements, could become seriously damaged or destroyed if underlying soils were to liquefy as a result of seismic shaking during a period when site soils are saturated and/or during a period of seasonally high groundwater elevation. This potential impact would be significant, especially since this is the area of greatest proposed land use densities. Both Oak Flat and Salado Creek golf courses lie within the area of greatest liquefaction potential. Liquefaction within the golf courses could damage the playing surface. However, since there would be very few project improvements and structures on the courses, and since the expectant golfing population per square mile would be significantly lower than adjacent land uses, the potential for damage and personal injury within the golf course areas during an earthquake could be considered below a level of significance.

Expansive Soil

As mentioned in the discussion of potential impacts of expansive soils for the overall site in general, the Phase 1 soil shrink-swell potential varies between soil types and even within the soil complexes themselves. Within a single soil complex, the shrink-swell potential could vary from low to high, making it very difficult to locate specific problematic areas. The one soil unit within the vicinity of the Phase 1 area that is entirely comprised of highly expansive soil is located within the landslide area three miles east of Village 1 along Oak Flat Road. Unless properly buttressed and allowed to drain this hillside could continue to landslide, significantly impacting access to and from the site. Site

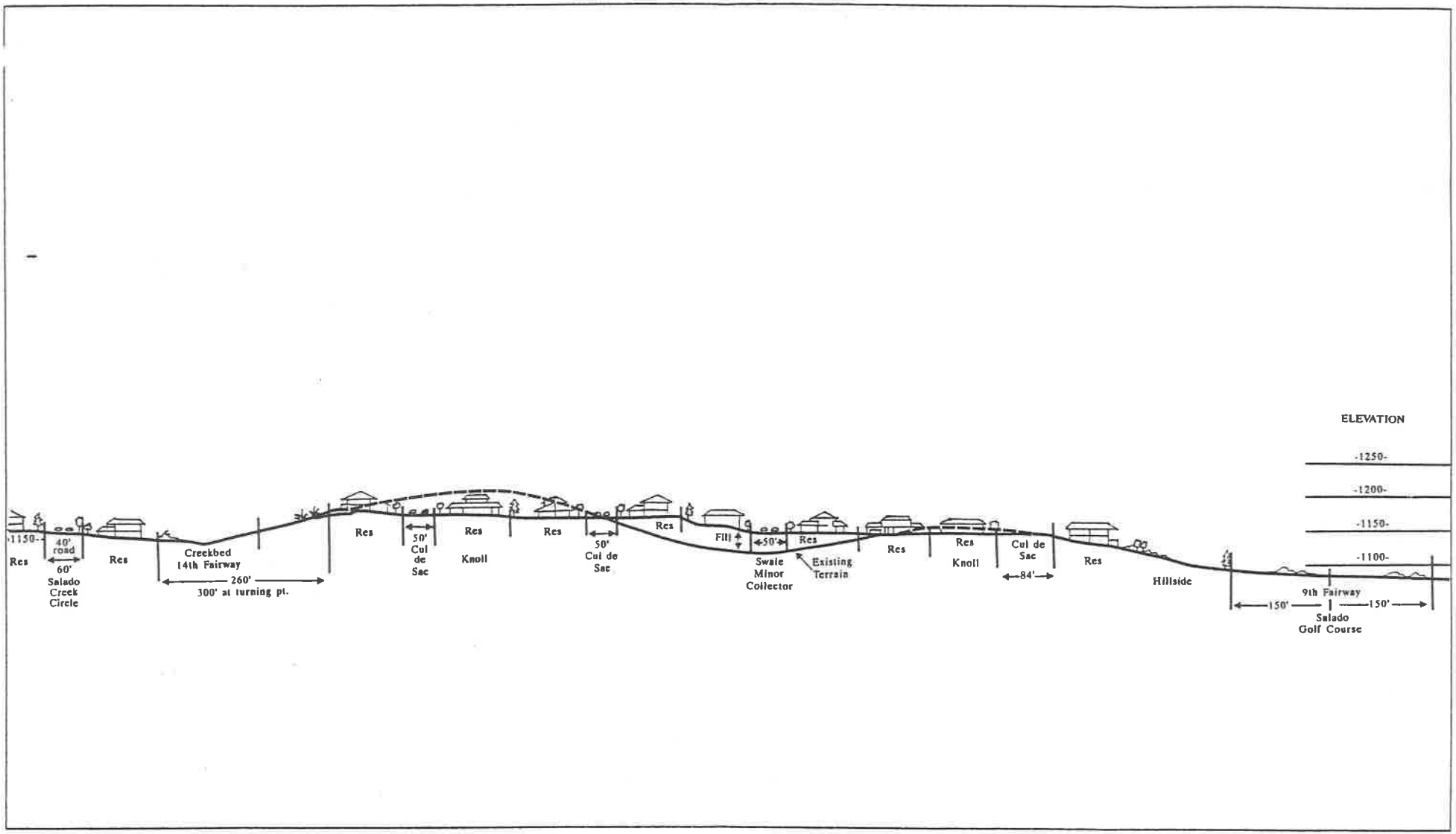

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Figure IV.B-5

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LSA Scale in Feet 0 70 140

Phase 1 Typical Grading Cross Section

soils with moderate shrink-swell potential can crack foundations and roadways, and damage utilities.

Soil Corrosivity

The potential impacts to Phase 1 development from corrosive soils would be the same as those mentioned in the general description for the overall site.

Primary Access Road

Grading

Project grading would be necessary for the construction of the proposed two-lane Primary Access Road. Because the majority of the roadway follows the open course of existing intermittent drainages, extensive hillside cutting is not expected to be necessary to accommodate the two-laned roadway. However, other grading activities such as the filling and/or culverting of existing streambed would be necessary. These activities may result in the significant alteration of the stream course topography and impact stream and well as roadway embankment stability.

Erosion and Slope Instability

Project grading is not expected to result in significant steep and potentially unstable hillside slopes due to its alignment with an existing drainage. There may be localized areas, however, near the south-central section of the roadway which may require hillside cutting in order to accommodate the road. Without proper engineering procedures, such as benched contours, adequate drainage, and erosion control measures, these slopes could result in significant erosion and local slope instability impacts.

Seismic Concerns

The Primary Access Road would be subject to damages during seismic activity along the nearby active faults, as would the site as a whole. Strong seismic shaking could induce landslides and rockfalls in the adjacent hills above the roadway and sliding, slumping or sluffing of adjacent creek embankments. Seismic shaking could cause road signage and light fixtures to topple, and uneven surfaces in the paved roadway, creating hazards for the automobile travelers. Liquefaction could cause the soils underneath the lower-lying sections of the roadway near or with alluvium deposits to fail, damaging the road surface. Since there are no faults traces mapped along the proposed roadway, the potential for fault rupture is low.

Expansive Soil

The potential for roadway damages as a result of the seasonal expansion and contraction of site soils varies from soil to soil and could therefore range from low to severe.

Soil Corrosivity

The potential impacts to the Primary Access Road and buried utilities that may be located within the roadway right-of-way from corrosive soils would be the same as those mentioned in the general description for the overall site.

Mitigation Measures

Overall Site

Grading Activities/Slope Stability

1. A detailed geotechnical evaluation shall be prepared as part of the project design process. The evaluation shall include the exploration and assessment of soil, bedrock, groundwater, and other subsurface geologic conditions necessary for evaluating project feasibility; and evaluating cut and fill slope stability to provide soil engineering criteria for project grading, retaining wall structures, and foundations. The evaluation shall be based on adequate surface and subsurface exploration, sampling, laboratory testing, and engineering analysis.

2. Properly qualified field engineers shall be used to perform grading observation and testing during construction. The progress of the earthworks construction shall be periodically evaluated by a certified engineering geologist and/or geotechnical engineer, and incorporated into the Mitigation Monitoring Report.

3. All development and grading plans for the project shall be reviewed by a licensed civil engineer for compliance with Chapter 70 of the Uniform Building Code. The county shall make the final review of plans and provide any additional conditions of approval prior to issuance of the grading and building permits. The U.S. Army Corps of Engineers would be responsible for providing their approval of permits for grading done within their jurisdiction.

4. Potentially unstable slopes or cut and fill slopes created through project grading shall be stabilized through site-specific mitigation measures provided by a qualified geotechnical engineer. Such measures may include soil stripping, scarification and recompaction,

and/or the reduction of the proposed cuts, the construction of a buttressed fill, benched slopes, and/or retaining walls. Retaining walls shall be subdrained and designed to resist lateral pressures appropriate to the size of the backslope.

5. Grading generally shall not be permitted on slopes greater than 25 percent. Any exceptions to this shall be at the discretion of the Public Works Department, and shall be required to include geotechnical analyses and erosion control plans.

6. In addition to grading being balanced on-site within each phase, grading activities shall be staggered so as to minimize the total area affected by grading at any given time.

7. Lots shall be set back from the toe of slopes as recommended by the geotechnical engineer.

8. The four development areas east of Oak Flat Road within Phase 1 shall be given special treatment to reduce the extent of topographic alterations and limit grading to retain natural contours.

Erosion Control

9. Interim and Final erosion control plans shall be prepared and submitted to the County for review and approval prior to the issuance of grading permits. If earthworks construction is to take place during the rainy season, a wet weather erosion protection program shall be developed and implemented. Measures that would be needed at any crossings of Salado, Crow, or Orestimba creeks as well as their main tributaries include the installation of filter berms, sandbag or straw bailed barriers anchored by rebar, siltation retention fences, and the retention of natural vegetation between the erosion source and the sensitive area. Soil piles shall be covered at the end of each day. During the rainy season, these wet weather erosion protection measures shall be stored on site. Prior to the onset of wet weather, areas disturbed by partially or completed grading shall be hydroseeded.

10. To minimize erosion, siltation, and stream impacts, as little of the surface soils as possible shall be exposed during project grading and construction activities.

11. Excavated materials shall not be sidecast during site preparation, construction, and final grooming of cuts and fills, when such materials could come to rest in proximity to streams or gullies. Grading shall be conducted in such a manner that downslope roll of rocks, boulders, and other soil material is minimized.

12. If a borrow site must be developed, it shall be located at an environmentally acceptable area, that avoids sensitive areas such as drainage courses or steep slopes where stream siltation or erosion would result. The borrow site shall be reclaimed following its use.

13. In areas which require the removal of brush but not grading, the root crowns shall be left intact, so as to retard soil erosion.

14. Project landscaping shall consist of deep-rooted drought resistant shrubs, trees, and ground covers instead of shallow-rooted species.

Seismic Concerns

15. All project components (cut and fill slopes, structures, utilities, roadways) shall be constructed according to all State and local building design standards that have been adopted by the County.

16. All interior fixtures, utilities, and furnishings shall be securely attached to the walls, floors, or ceilings to reduce the risk of damage or injury from falling objects. Homeowners shall be informed of appropriate measures to prevent toppling of personal property during earthquakes.

17. An earthquake emergency plan for the project shall be prepared and incorporated into the proposed project. The plan shall address what project residents and employees shall do in the event of an earthquake. Community shelter locations shall be established and emergency exit routes made known.

18. The foundations of structures within areas of high liquefaction potential shall be extended down beyond the sandy deposits into solid bedrock material. Special engineering procedures shall also be implemented to ensure roadway protection from damage and/or closure due to liquefaction.

Expansive Soil

19. Adverse effects of expansive soils shall be mitigated by extending building foundations below the zone of expansive soils subject to seasonal moisture variations, or by moisture conditioning and capping these soils with non-expansive soils to support footings and slabs. If relatively shallow, expansive soils could be removed below buildings or other improvements. However, the expansive potential of materials exposed beneath the soils shall be evaluated to determine if soil removal if appropriate. Roadways may require relatively thick layers of aggregate base and subbase as well as a thick section of asphalt-

concrete to minimize the potential damage due to shrinking and swelling of soils. The project geotechnical and structural engineers shall provide recommendations on the foundation design criteria and spacing, depth and diameter of foundation support piers upon review of soil strength data provided in the detailed geotechnical report.

20. Expansive soil removed from one area shall be placed in an area where the shrinking and swelling nature of the soil would not create significant adverse impact or result in damage to structures.

Corrosive Soil

21. Underground utilities, and subsurface steel and cement structures shall be protected from adverse effects of soil corrosion either through the provision of a buffer zone or trench filled with non-corrosive material such as gravel or neutral soil, or the encasement or lining of the underground project improvements.

Phase 1

The same general mitigation measures listed for the overall site shall be required for the development of Phase 1. The following specific measures shall be implemented prior to development of Phase 1 and the Primary Access Road.

Grading Activities/Slope Stability

22. Grading plans shall be prepared for the earthwork necessary to construct the Oak Flat Parkway, Primary Access Road, and Oak Flat Road. The plans shall be reviewed and approved by the County prior to issuance of the grading permit.

23. A slope stability analysis of the large landslide along the Oak Flat Road access shall be included as part of the detailed geotechnical report for the project. The report shall provide recommendations for slope stability measures to ensure that future landsliding activities not impact the proposed roadway at its base. All recommended measures shall be incorporated into the proposed project plans.

C. HYDROLOGY AND WATER QUALITY

Background

In October 1989, R. C. Slade, Consulting Groundwater Geologist, prepared a hydrogeologic feasibility study for Phase 1 of the Diablo Grande project site. In October 1991, Bookman-Edmonston Engineering, Inc. prepared the preliminary stormwater collection system plan for the overall project and for Phase 1, as part of their Utilities Master Plan for Diablo Grande. A separate study analyzing the effects of on-site stormwater detention ponds into the project stormwater collection system was prepared by Rochester and Associates, Inc. in March 1992. The results of these studies, as well as other available published information, were supplemented with a site reconnaissance by LSA staff to prepare the following analysis.

Setting

Overall Site

Climate

The Diablo Grande project area is characterized by hot dry summers with low humidity, cool rainy winters with high humidity, and dark rainy and cloudy periods interspersed with mild sunny days. Approximately 80 percent of the year's total rainfall occurs from November to March. Data from the U.S. Weather Bureau Station at Newman, approximately 14 miles southeast of the Phase 1 property, are reportedly representative of rainfall and other climatic factors at the project site. The mean annual temperature for the Newman area is about 80°F in July and about 46°F in January. Summer temperatures exceeding 110°F and winter temperatures below 27°F are rare. Mean annual precipitation at the Newman Weather Bureau station is 10.24 inches. The difference between climatic factors at the project site and Newman are estimated at $\pm$ 2°F and $\pm$ 0.1 inch in precipitation (Charles Nelson, National Weather Bureau, pers. comm., March 1990).

Regional Hydrology and Drainage

Regional drainage for the eastern coast ranges in the project area is provided by Garzas, Orestimba, Crow, Salado, Del Puerto, and Ingram creeks, each of which trends at almost right angles (east-west) from the eastern slopes of the Coast Ranges to the San Joaquin Valley. None of these streams flow perennially and all are dry throughout most of the year. Orestimba Creek is the only stream large enough to maintain a definite channel across its alluvial fan to the San Joaquin River. In much of the San Joaquin Valley, annual rainfall is so low that little penetrates deeply and soil moisture deficiency is perennial (Slade, 1989).

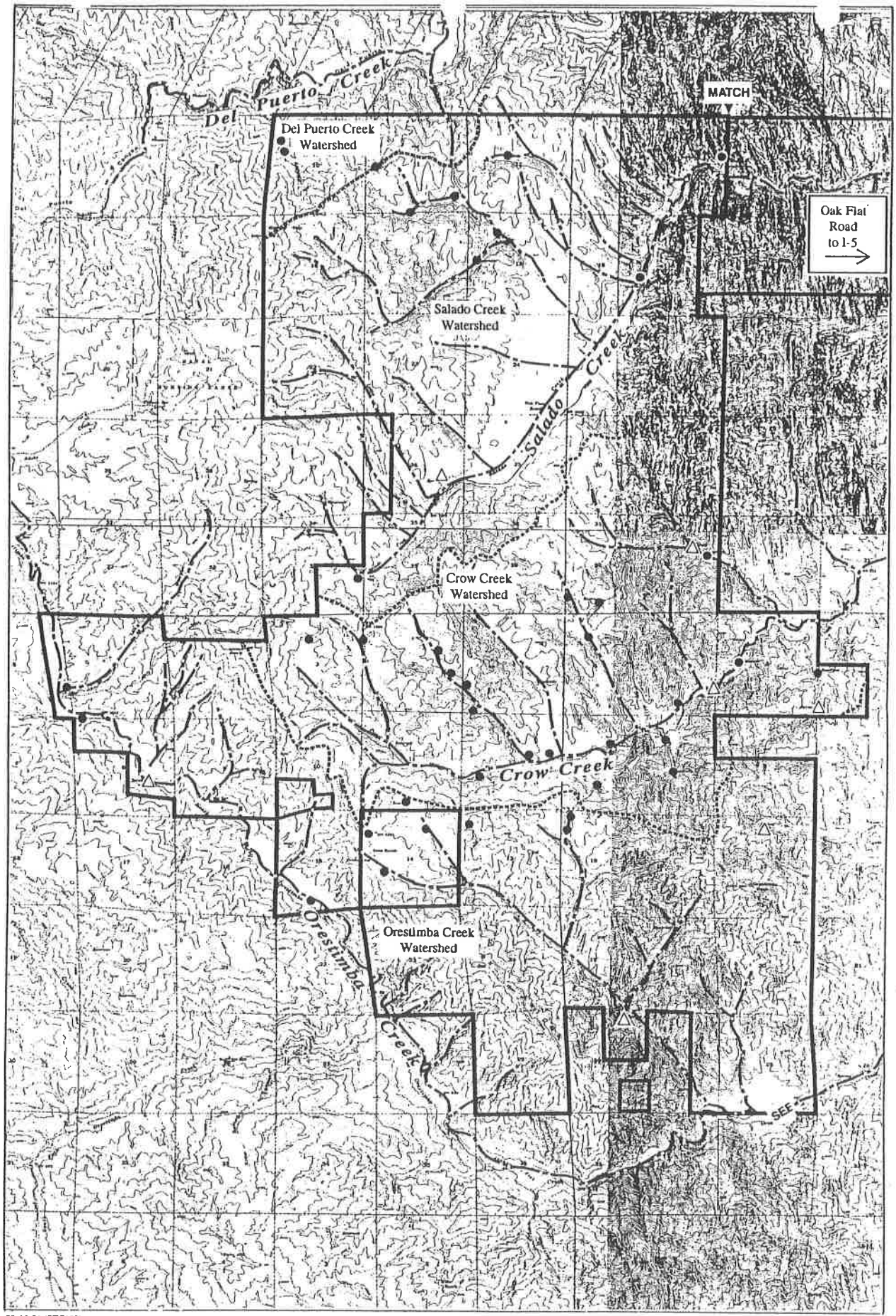

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Figure IV.C-1

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LEGEND

- Intermittent Creeks
- Watershed

Scale in miles

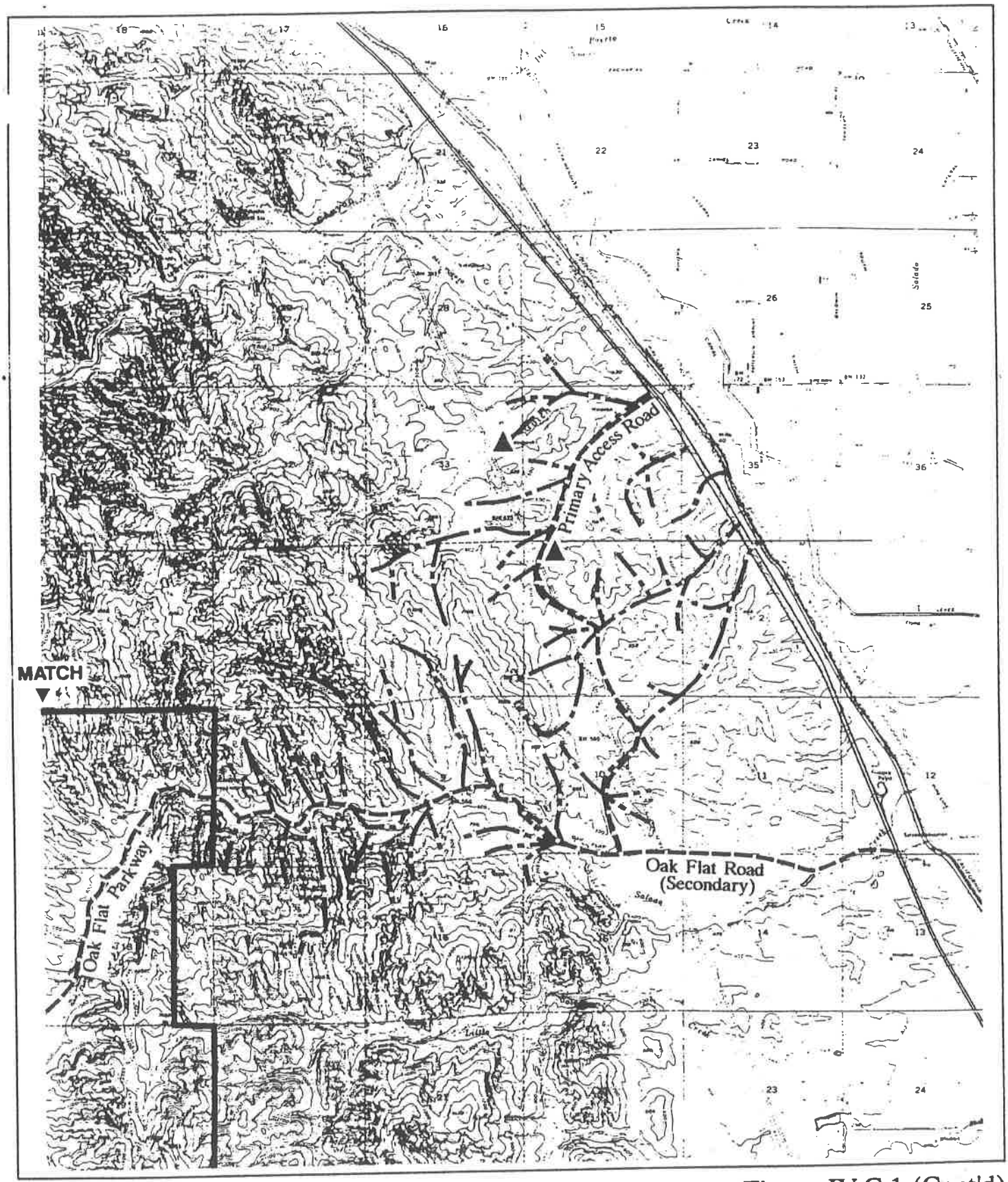

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Figure IV.C-1 (Cont'd)

Project Site Drainage System

Salado, Crow, and Orestimba creeks provide drainage for the Diablo Grande project site. A small portion of the northwest corner of the site drains to Del Puerto Creek to the north. Figure IV.C-1: Project Site Drainage, shows the location of these three creeks, their tributary drainages, and the boundary of their respective watersheds within the project site. Oak Flat Road (not shown in the figure) is entirely within the Salado Creek watershed. The northern two miles of the proposed Oak Flat Parkway that intersects I-5 near Sperry Avenue, is within a small unnamed watershed between Black Gulch and Salado creeks. Proposed Village 1 is entirely within the Salado Creek watershed. Village 2 is in both the Salado Creek and Del Puerto Creek watersheds. Village 3 is in both the Salado Creek and Crow Creek watersheds. Village 4 is entirely within the Crow Creek watershed, while Village 5 is entirely within the Orestimba Creek watershed.

Salado Creek watershed is approximately 10,350 acres at the lower end of the development and approximately 16,200 acres where Salado Creek crosses I-5 (Rochester and Associates, Inc. 1992). Salado Creek watershed consists of grazed grassland with scattered oak trees. Vegetation is present within the creek channels. The highest point within the watershed is Copper Mountain at elevation 2,678 feet above mean sea level (msl). Salado Creek channel is at elevation 900 feet at the bottom of Phase 1 and at 240 feet above msl, where Salado Creek crosses I-5.

Crow Creek watershed is approximately 16,800 acres where Crow Creek crosses I-5. The highest point within the watershed is Mikes Peak at elevation 2,620 feet above msl. The channel invert is at elevation 240 feet above msl, where Crow Creek crosses I-5. Crow Creek watershed is similar to Salado Creek drainage in terrain and land use.

The tributary of Orestimba Creek in which proposed Village 5 is located has a drainage area of 5,800 acres where it combines with the mainstream of Orestimba Creek. The highest point within this watershed is Orestimba Peak at elevation 2,074 feet above msl. The channel outlet is at elevation 400 feet above msl at the confluence of Orestimba Creek. The Orestimba Creek watershed is similar to Salado Creek drainage in terrain and land use.

Using an average annual rainfall of 10.25 inches, an average total volume of 25,190 acre-feet of precipitation would fall on the Diablo Grande project site annually. Additional runoff from the surrounding hillsides outside the project area would flow across the project site and down its drainages to the east. Because much of the site consists of moderately steep hills, and site vegetation is limited to occasional oaks and seasonally over-grazed grasses, the stormwater runoff is estimated to be approximately 30-50 percent for the total average annual rainfall within each watershed. Runoff from the Diablo Grande project site alone would therefore be between 7,550 and 12,600 acre-feet annually.

During site visits, embankment undercutting and erosion of the project site drainages was observed, indicating fluctuations in the amount of stormwater

runoff through the years, areas of low-energy creek sections, and the inability of project soils to resist erosion by water. The most extensive area of creek meandering was noted along Crow Creek, within the proposed Village 4.

Flooding

Regional. Although the mountainous project site is not mapped within a 100-year floodplain, drainage from this area flows east towards the San Joaquin River, which has a history of significant flooding problems, as does the majority of Stanislaus County. Flooding has been particularly intensified with the encroachment of urban growth into the floodplains. Major floods occurred in 1861, 1938, 1950, 1955, and 1969. Significant flooding also occurred in 1983 along the San Joaquin River, along isolated stretches of the Tuolumne River, and on smaller creeks such as Salado Creek (Stanislaus County, 1987).

In addition to the Water Reclamation Board restricting development encroachment into the floodplains, substantial action has been taken to reduce flood hazards. Remedial actions include the construction and regulation of flow from Don Pedro Dam on the Tuolumne River and the New Melones Dam on the Stanislaus River. Flood control measures taken along the San Joaquin River include the U.S. Army Corps of Engineers' construction of levees along specific problem-prone areas, and the implementation of the Statewide flood control program which monitors the levels of various rivers in the State and regulates all proposed releases from dams.

Local. The Orestimba Flood Control District, located at the base of the Crow and Orestimba creeks' confluence, is the only flood control district in the County. Future flood control districts may be established for Salado Creek (Patterson) and Sand Creek (Denair, near Turlock) (Stanislaus County, 1987).

According to information provided in the 1986 U.S. Army Corps of Engineers' Hydrologic Report of Stanislaus County, during the 100-year, 24-hour storm design, Salado, Crow, and Orestimba creeks could receive between 3.69 and 4.72 inches of precipitation. The expected 100-year flows from Salado, Crow, and Orestimba creeks are 2,570 cubic feet per second (cfs), 3,820 cfs, and 15,600 cfs, respectively (see Table IV.C-A: Project Site Watersheds and 100-Year Flows). These flows contribute to flooding downstream.

The majority of the Diablo Grande project site is well drained. The only areas where on-site flooding is possible are the low-lying floodplain areas where low-energy creek segments are shallow and serpentinous, where debris and sediment has blocked the flow of water, and in localized areas downstream of failed reservoirs and stock ponds. In these areas flooding could be expected to be localized during great precipitation events.

Table IV.C-A - Project Site Watersheds and 100-Year Flows

Water Body	Basin Acreage[1]	100-Year Flow[2]
Salado Creek	16,200	2,570 cfs
Crow Creek	16,800	3,820 cfs
Orestimba Creek	5,800	15,600 cfs

[1]Salado Creek drainage basin acreage data obtained from Rochester Associates, Inc., 1992. Acreage planimetered at base of watershed near I-5. Crow Creek and Orestimba Creek drainage basin acreage data obtained from Bookman-Edmonston Engineering, Inc., 1991.

[2]Salado Creek 100-year flow data obtained from Rochester & Associates, Inc. 1992. Crow Creek flow data obtained from 1990 Lakeborough EIR Technical Appendices. Orestimba Creek flow data obtained from 1986 U.S. Army Corps of Engineers report, Hydrologic Report of Stanislaus County.

Surface Water Quality

Regional. The water quality of the three main rivers in Stanislaus County (Stanislaus, Tuolumne, and San Joaquin) is excellent at the rivers' sources in the Sierra Nevada, but as they flow through the San Joaquin Valley, their quality is impaired by each successive use. Both agricultural and domestic use and return contribute to their degradation. As flows decrease seasonally, concentrations of pollutants increase, particularly in the San Joaquin River, which serves as a drain for return water and domestic and industrial wastes throughout the entire San Joaquin Valley. Agricultural runoff contributes up to 50 percent of the summer flow of the San Joaquin River. This runoff contains sediments, pesticides, salts, and nutrients.

According to the State Water Resources Control Board 1990 Water Quality Assessment (WQA), approximately one-third of the San Joaquin River is listed as having impaired water quality from non-point sources. One trace element that has been the focus of numerous water quality studies on the San Joaquin River has been selenium. The soils of the Panoche Fan area of the western central San Joaquin valley are naturally saline and contain selenium. Irrigated crop production has mobilized the trace element selenium from the soil and into the shallow groundwater and is now discharged with agricultural drainage water. Discharge of selenium tainted drainage water into wetlands has adversely impacted waterfowl and other aquatic habitat (RWQCB, January 1991). As part of the 1985 legislation, the State Board and the Regional Boards have taken action to try to identify and evaluate all sources of selenium and other trace elements such as salt, boron and molydenum that may be impacting water quality.

Local. One of the studies tested the salt and trace element loading to the San Joaquin River by ephemeral streams within the eastern coast range, in which the Diablo Grande project site is located. Water samples taken with Salado, Crow, and Orestimba creeks approximately three miles east of the project site indicated slightly elevated trace element concentrations within the Salado and Crow creeks. Underlying rock and geologic formations were found to have a strong influence in the quality of water that passes through and over them. Approximately three miles of Orestimba Creek (east of the project site) was sampled in the 1990 WQA. Test results indicated a threat of fish kills. Although no water quality samplings have been made within the Diablo Grande project site, it can be anticipated that its creek could contain similar levels of trace elements. In addition, elevated levels of sediment (from erosion) and nitrates (from wild animals and domestic cattle) could be expected to influence the local water quality.

Groundwater Geology and Volume

Approximately four miles east of the Diablo Grande project area lie continental rocks and deposits of Tertiary and Quaternary age comprised of a number of formations and informal deposits that constitute the major aquifers of the San

Joaquin Groundwater Basin to the east. These continental rocks and valley-fill deposits generally crop out on the valley floor and as wide belts along the flanks of the Valley, consisting of a heterogeneous mixture of poorly-sorted clay, silt, sand and gravel, or locally of more consolidated sediments such as mudstone and sandstone. The average depth to the water table is approximately 40 feet. Production rates from wells in these rocks and deposits, except for lacustrine and marsh deposits found in the San Joaquin Valley, range from about 20 gallons per minute (gpm) to 4,500 gpm (Slade, 1986).

However, the Diablo Grande project area does not overlie any recognized groundwater basin, and lies entirely west of the above-mentioned Tertiary and Quaternary rocks and deposits. The principal recharge sources for the site are direct precipitation on exposed surfaces and direct infiltration from overlying saturated alluvium within stream channels.

The one unit of the Panoche Formation that is considered to have the greatest potential for viable aquifers is the cobble conglomerate and sandstone layer (map symbol Kpc). In general, coarser-grained sediments are deposited in the main channels of the ancient drainage systems, and provide better flow rates than finer-grained sediments deposited in interchannel areas. However, as seen on the site geology map (see Figure IV.B-2), very little of this unit underlies the project area. Subsurface outflow to older beds below the conglomerate and sandstone units is considered negligible due to the finer-grained nature of the Adobe Flat Shale member, the basal unit of the Panoche Formation. There has been no previous comprehensive investigation of the hydrogeology of the lower Panoche Formation and its usefulness as a groundwater storage reservoir and its capacity to yield water to wells have never been defined (Slade, 1989).

Groundwater Quality

Regional. The groundwater situation west of the San Joaquin River is substantially different from the rest of the County to the east. Three problems exist: a rising perched water table, saline build-up in the soil, and an increasing imbalance in the groundwater body. These conditions exist through combinations of canal seepage, excessive irrigation, and poor quality irrigation water. The decreasing groundwater quality is having adverse effects on domestic water supplies as well as the agricultural lands. As groundwater becomes unacceptable for domestic use, other sources (such as the Delta-Mendota Canal) will be explored.

The typical total dissolved solids (TDS) for groundwater in the area, as reported by a geophysical contractor, is on the order of 900 milligrams per liter (or ppm), with well water from canyon bottom sites having a somewhat lower TDS. Well data for groundwater south of Patterson indicates a TDS level of 1594 ppm. These numbers compare with the U.S. Environmental Protection Agency and State Department of Health Services Secondary maximum

contaminant levels for total dissolved solids of 500 parts per million (ppm). Because site-specific quality data was unavailable to the Slade study and because no on-site groundwater quality tests have been made, it is unknown if these reported TDS levels are representative of groundwater from formations within the Diablo Grande project area.

Estimates of theoretical water quality in terms of TDS using data derived from there spontaneous potential and resistivity curves of electric logs of oil and water wells were not possible due to the lack of nearby wells with a standards set of resistivity curves for the lower Panoche units (Slade, 1989).

Based on the typical abundance of sulfate and/or chloride ions in finer-grained rocks similar to much of the older sedimentary rocks in the study area, these ions may be present in relatively high concentrations in on-site groundwater (Slade, 1989).

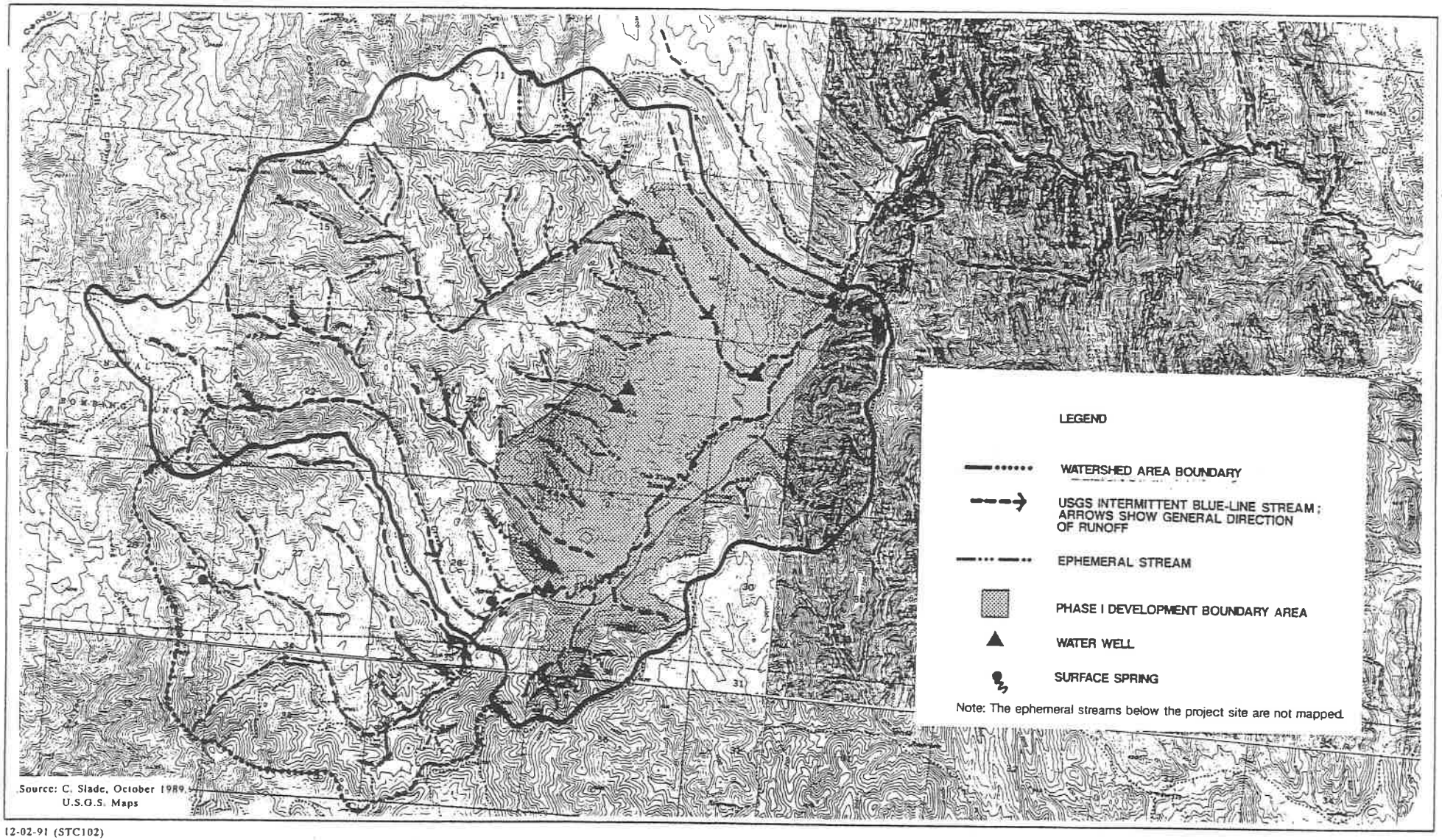
Phase 1

Hydrology and Drainage

The locations, alignments, and flow directions of the three main creeks which drain the Phase 1 area are shown in Figure IV.C-2: Phase 1 Drainage. These creeks, which generally drain the property from west to east, include: an unnamed creek on the north which joins Salado Creek just east of the Phase 1 property line; Lotta Creek which flows into Salado Creek in the south-central portion of the Phase 1 area; and Salado Creek, the main drainage in the entire Phase 1 area, located in the southern half of the area. Along Salado Creek there is evidence of both natural and man-made stream course alterations, particularly at or near the creek's crossing of Oak Flat Road.

Also illustrated in Figure IV.C-2 are the locations of four known springs and surface seepages in the region. One of the four is located on the westernmost edge of the Phase 1 site. Flows in these springs vary due to short-term and long-term precipitation variability. None of these springs display large flows.

The 2,000-acre Phase 1 project area lies at the base of a 10,350-acre tributary watershed which includes rangeland upstream of and including the Phase 1 development (Rochester and Associates 1992). As seen in Figure IV.C-2, the watershed for Salado Creek and its tributaries that flows directly through Phase 1 extends approximately 0.5 mile north and 0.5 to 1.5 miles west of the Phase 1 boundary. Within the Phase 1 watershed, there are approximately six sub-watersheds, three intermittent streams, and 30 ephemeral streams. Within the Oak Flat Road right-of-way, outside the Phase 1 area, there are approximately 10 intermittent streams and 20 ephemeral streams. During a site reconnaissance, it was noted that only short sections along Salado Creek had surface flow. Because much of the site consists of moderately steep hills, and site vegetation is limited to oak and over-grazed grasses, the stormwater runoff is estimated to be on the order of 30 to 50 percent of the total average



12-02-91 (STC102)

Figure IV.C-2

N

LSA Scale in Feet 0 1500 3000

Phase 1 Drainage System

annual rainfall on the watershed. Assuming an average annual rainfall of 10.25 inches, an average total volume of 8,840 acre-feet of precipitation would fall on this tributary watershed each year. Therefore, the annual runoff volume from the Salado Creek drainage basin above Phase 1 would range between 2,650 and 4,420 acre-feet per year. Of this volume, most is lost by direct surface runoff and evapo-transpiration. Some surface runoff with the Phase 1 watershed area would be retained in the small reservoirs and stockponds that have been created in the hills above Salado Creek. Between 510 and 855 acre-feet of runoff currently flows from the confines of the proposed Phase 1 development area.

Flooding

Although a floodplain study along Salado Creek has not been prepared, localized areas of flooding could be expected within the low-lying alluvium areas in the vicinity of the Oak Flat Ranch where the creek is not so deeply incised, where it bends, and/or where debris has blocked its path. As part of the preliminary Stormwater Management Study perpared by Rochester & Associates, the existing peak flows along Salado Creek at the base of the Phase 1 development area were calculated. Table IV.C-B indicates the peak flows along Salado Creek for the two-, five-, ten-, 25-, 50-, and 100-year storm events. Failure of any of the several small reservoirs and stockponds above Oak Flat Ranch during the longest return storm periods could result in localized flood surges downstream from Salado Creek.

Surface Water Quality

Surface water quality within the Phase 1 area would be the same as discussed under the overall site section. Due to the Phase 1 area being the central location for existing human and grazing activities on the property, the local water quality along Salado Creek may be slightly lower than surrounding areas.

Groundwater

According to the Hydrologic Feasibility Study prepared for the Phase 1 site, deep percolation of rainfall onto the on-site earth materials is on the order of 10 percent of the total average annual rainfall on the watershed. Therefore, the total average volume of annual recharge to the aquifers underlying the local Phase 1 watershed is on the order of 725 acre-feet per year under average annual rainfall conditions (Slade, 1989).

A rough estimate of the groundwater in storage in the potentially water-bearing Panoche Formation units (Kpc and Kps) was made for 6,400 acres of the immediate surrounding tributary to the Phase 1 area (Slade, 1989). Results of that calculation show that there could be on the order of 4,200 to 8,500

Table IV.C-B - Salado Creek Peak Flow Summary at Base of Phase 1

Return Period (years)	Existing Conditions (cfs)	Proposed Condition (cfs)
2	44	56
5	488	498
10	822	748
25	1,113	972
50	1,425	1,224
100	1,644	1,401

SOURCE: Rochester & Associates, Inc. March 1992

acre-feet of groundwater in storage beneath the property in the potentially water-bearing units of the lower Panoche formation. The actual Phase 1 site however, is much smaller (2,000 acres), and therefore the volume of available groundwater underlying the property would be much less. The 4,200 to 8,500 acre-feet figure could be useful in the determination of available groundwater on the Phase 1 site and its tributary basis.

Existing wells in the area are located in the vicinity of the alluvial sediments associated with Salado Creek. These wells are shallow (30 to 50 feet), and produce primarily from the alluvium. Most wells in the area are windmill-driven and likely produce only a few gpm for stock watering needs. A "good" well in the region has depths approximately 150 feet and flow rates of at least 12 gpm and possibly as high as 30 to 50 gpm (Slade, 1989). Alluvial wells often dry during late summer months and have their best flow rates during the rainy season or following a series of wet years. Local drilling and geophysical logging contractors reported little available groundwater in the area, with most of the water coming from alluvial sediments in the uppermost 50 feet.

Locally high groundwater in the vicinity of the Phase 1 area is evidenced from the two springs mapped on USGS topographic maps (see Figure IV.C-2). These springs are located along Salado Creek near the southern boundary of Phase 1, and in the headwaters area of Salado Creek just west of Phase 1 and are often used for stock ponds.

Groundwater Quality

As discussed under the groundwater quality discussion for the overall site, site-specific groundwater quality data for the site is not available. Groundwater quality information from surrounding areas would be the same as previously discussed.

Primary Access Road

Hydrology and Drainage

The proposed Primary Access Road traverses three main intermittent streams, all of which lie within separate watersheds. The northernmost one and one-half mile of the Primary Access Road follows the course of the intermittent stream that flows north to the unnamed gulch that empties out at I-5 near Sperry Avenue. The central portion of the proposed road traverses a northeast flowing intermittent stream which empties out near I-5, just north of Elfers Road. The southernmost mile of the proposed Primary Access Road follows the course of an intermittent tributary stream of Salado Creek. This stream empties out near the cherry orchard. Approximately 12 ephemeral streams flow from the hillsides adjacent to the Primary Access Road corridor.

Flooding

Similar to the discussion under Phase 1, although a floodplain study along these streams has not been prepared, localized areas of flooding could be expected within the low-lying alluvium areas in the northern and central portions of the proposed roadway.

Surface Water Quality

Surface water quality within the proposed Primary Access Road vicinity would be the same as discussed under the overall site section.

Groundwater

There are two windmill-driven wells located within the northernmost mile of the proposed Primary Access Road. These wells are located within the alluvium sediments associated with the northward-flowing intermittent stream and are expected to be shallow, similar to those located within Oak Flat Ranch.

Groundwater Quality

As discussed under the groundwater quality discussion for the overall site, site-specific groundwater quality data is not available. Groundwater quality information from surrounding areas would be the same as previously discussed.

Potential Impacts

Overall Site

Drainage Pattern Alteration

The proposed drainage plan includes a comprehensive system of surface storage ponds and reservoirs and underground storm drainage pipes. A conventional underground stormwater system would be designed for each phase of development and a Drainage Plan is to be submitted prior to approval of each Tentative Map. The most significant creekways on-site are to be preserved and regulated by a Diablo Grande Environmental Control Committee. Portions of the smaller tributary drainages within the proposed development areas would be encased in underground stormdrains. Various outlet structures into the main creeks would be installed. Culverts would be required within creek sections where road crossings are proposed. This Preliminary Drainage Plan design would not significantly alter the existing flow or tributary recharge areas of the main creeks. However, the drainage pattern

of the minor drainages would be significantly altered. Major watershed divides would not be affected by the project, however it is possible that minor tributary watersheds could be altered by the grading and master drainage plans.

Increased Surface Runoff

Development of the site would result in the creation of a significant amount of impervious surface area from proposed residential, commercial and light industrial areas where currently there is only a negligible amount. According to the Specific Plan, up to 39 percent of the entire site is proposed for development. The majority of impervious surfaces would be created for the residential area, the roadway system and employment areas would follow succinctly in their soil coverage. The proposed land uses could be expected to have the following impervious factors: low density residential (10 to 35 percent); medium to high density residential (60 to 65 percent); shopping center, town center, and resort (60 to 70 percent); public facilities (60 percent); winery, golf, health, and tennis clubs (50 percent); and Village roads (70 percent). Based on the these planning-level estimates, the amount of impervious surfaces created could be roughly 1,100 acres, approximately three percent of the total site. Precipitation on these areas would result in an additional 840± acre-feet of runoff per year. This post-development runoff value represents a 7 to 11 percent increase over the existing rate. These are planning-level estimates only; engineering calculations could vary substantially and should be made as plans are refined.

This amount of increased surface water runoff from the project site would be a significant change. However, in relation to the total amount of surface runoff from the project site watersheds, this amount would not be significant. The increased surface water runoff would contribute to cumulative increased runoff in the project vicinity. If not adequately mitigated, the increased surface runoff could significantly impact the physical condition of the main creek embankments where the outfall structures (existing drainage confluences) would be located. Increased surface runoff amounts could cause increased runoff rates which in turn can cause erosion and bank undercutting along unprotected creek embankments.

The proposed project would be subject to the recent State Regional Water Quality Control Board (RWQCB) legislation that requires all construction projects that require clearing, grading, and excavating five or more acres of land to apply for a Non-source Point Discharge Elimination System (NPDES) permit. In addition to the permit required during construction, all proposed land uses within the development would require a separate NPDES permit for discharge of stormwater.

Flooding. The additional surface runoff generated from project impervious surfaces during large precipitation events such as the 10- and 100-year events

can be expected to cause localized flooding in drainage collection points on-site if the drainage system is not adequately sized. In addition, the increased amount of surface runoff could cumulatively add to problems downstream east of I-5 where flooding is already a problem.

An estimate on the actual amount of runoff from the project site during the 100-year design storm will be calculated once the land uses for all phases is available. The Master Drainage Plan for Diablo Grande would be based on criteria required by Stanislaus County and the Federal Emergency Management Administration (FEMA). The generally accepted regional drainage practices require all local and access roads to have 10-year protection and all major arterial streets to have 100-year protection. Facilities draining areas greater than 0.5 square miles (approximately 300 acres) or culverts greater than 48 inches in diameter are to have 100-year protection.

Adverse Water Quality Effects

Unless adequately mitigated, adverse surface water impacts could be expected to occur as a result of Diablo Grande project site development. Project grading over 39 percent of project site could contribute significantly to creek sedimentation if appropriate erosion control measures were not utilized and if grading was performed during wet weather. As mentioned earlier, unprotected creek embankments receiving runoff from the drainage system could experience accelerated erosion near the outfall locations as well as further downstream if runoff rates were not controlled. Increased stream turbidity degrades its water quality.

Urban pollutants such as oil, grease, and rubber could be expected to flow off roadways and parking areas, cumulatively adding to stream and groundwater degradation. Other common urban pollutants such as fertilizers, pesticides, and animal fecal waste could be generated within residential and commercial landscaped areas, adding to the cumulative stream degradation. The chemicals used within the proposed golf courses and polo grounds alone could contribute significant adverse impacts to water quality due to their greater maintenance needs. The potential impacts would be a function of the types and amounts of the fertilizers and pesticides used, the timing and location of the applications, and related weather conditions (temperature, wind, and rainfall).

Excessive amounts of fertilizer in water bodies can affect the eutrophication levels (available oxygen necessary for aquatic life) and exceed the safe drinking water standard levels. Pesticides, though normally applied only in response to a specific problem, can also greatly impact water quality through use of inappropriate types. A pesticide chosen for its strong binding ability to soil organic matter may reduce the potential for leaching into the underlying groundwater, but as a result, is left with a very high potential for surface water contamination through runoff. The toxicity of pesticides to fish and wildlife varies greatly between products.

Development of up to 100 estates within the Conservation Areas would be outside of the public utilities service realm. Sewage generated within these areas would be handled by on-site septic systems. Property owners of these lots would be required to comply with Measure X and all applicable standards enforced by the Stanislaus County Department of Environmental Protection regarding tank location and design. Although septic systems are currently used on the Oak Flats Ranch for individual homes, the suitability of the Conservation Areas for many septic systems could be limited by shallow sediments and underlying bedrock near the surface. Construction of septic systems for these lots within soils that have a slow permeability rate could result in surface and groundwater contamination should the leach fields malfunction. Should the individual soil and goundwater characteristics of a proposed site be such that they would inhibit the proper functioning of a septic system, County approval for the lot development may be denied.

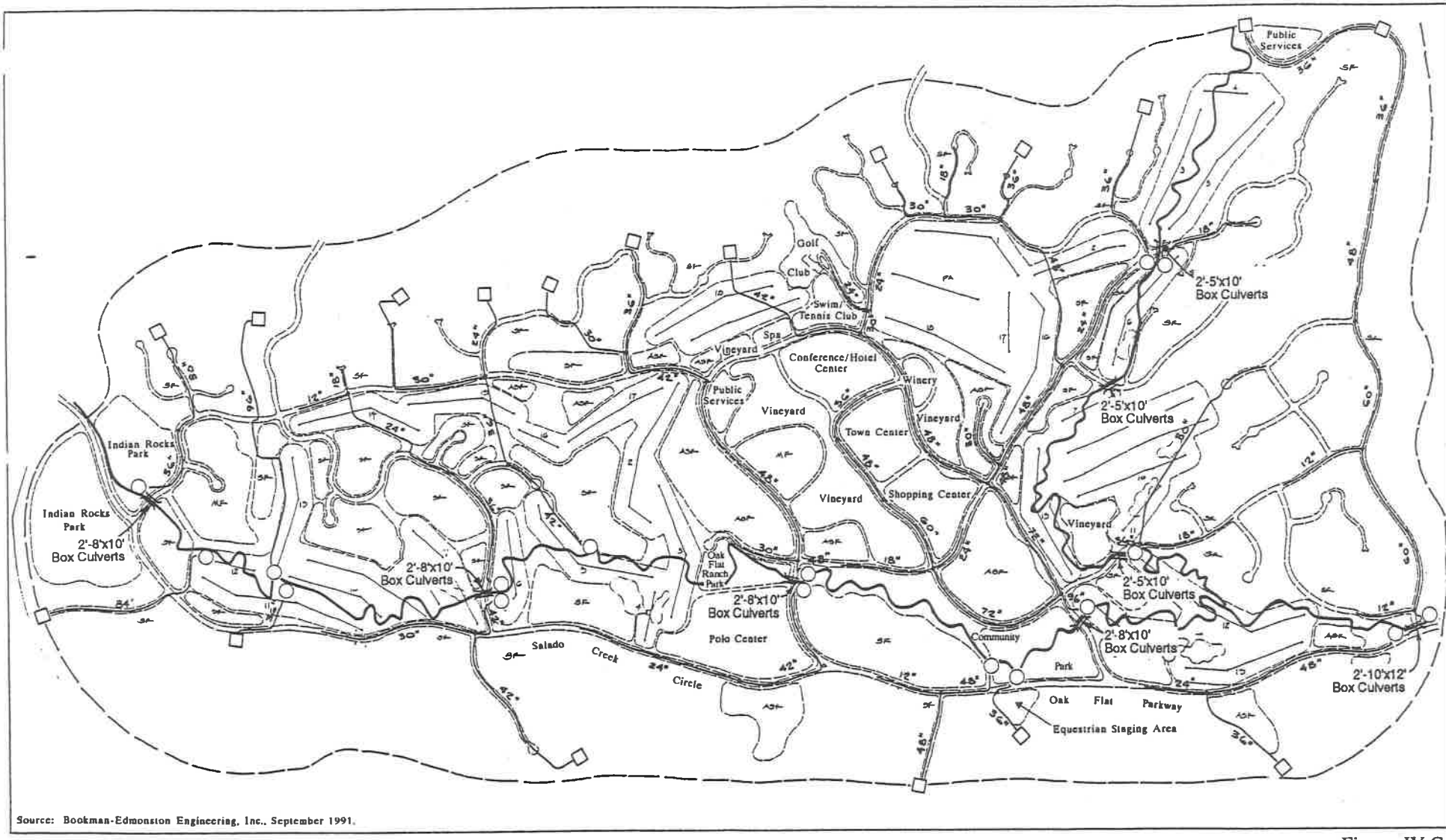
The NPDES permit required of the proposed project shall stipulate that implementation measures and practices be incorporated into the project to prevent pollution. The permits also require the implementation of a stormwater discharge monitoring program to measure the program's effectiveness and ensure compliance with runoff quality standards outlined in State and federal water quality objectives.

Fluctuations in Groundwater Levels. The project may result in differences in the local groundwater elevations. The proposed surface water reservoirs, drainage system, and increased impervious surfaces could reduce groundwater infiltrations and increase surface water runoff. This could be offset by irrigation with imported water which could recharge local groundwater tables. Project site groundwater is not proposed for use.

Phase 1

Drainage Pattern Alteration

A preliminary drainage system design has been prepared for the Phase 1 development area based on its proposed land uses (see Figure IV.C-3: Phase 1 Drainage System). The design utilizes Salado Creek and the unnamed tributary of Salado Creek as the main conveyance facilities. Planned land uses adjacent to these channels are golf courses and parks. These creeks would remain in their natural condition except where bank protection or channel improvements are required to contain the 100-year design flow. Portions of other smaller drainages would be contained in underground stormdrain pipes.



Source: Bookman-Edmonston Engineering, Inc., September 1991.

11-27-91(STC102)

LSA

Scale in Feet
0 450 900

LEGEND

- Inlet Structure
- Outlet Structure
- 24" 36" Drainage Pipeline
- Open Channel
- Culvert

Figure IV.C

Phase 1 Drainage Syste

Storm drain facilities have been designed to direct flows from the surrounding hillside drainageways into a series of culverts and to carry flows from the developed portions of the basin to the natural creeks. These facilities include approximately 71,000 feet of various diameter pipeline, 8 box culverts, 17 inlet structures, and 17 outlet structures. The facilities are to be located along street alignments where possible. Pipeline sizes are to accommodate velocities of three to five feet per second.

Four drainage basin ponds have been proposed by Rochester and Associates, Inc., to be installed within the Phase 1 area to reduce the runoff volumes and flow rates from the proposed development during heavy storms. These ponds would be located along Salado Creek in the Oak Flats Historic Park, the Community Park, near the vineyards at the 15th fairway of the Oak Flat golf course, and near the northern boundary of Phase 1 along Oak Flat Parkway. The proposed pond sizes and elevations of these ponds are summarized below:

Pond	Peak Volume Capacity (acre-feet)	Elevation (above msl)	Location
A	46.8	916 feet	Northern boundary of Phase 1 along Oak Flat Parkway
B	10.3	981 feet	Vineyards near 15th hole of Oak Flat Golf Course
C	53.5	963 feet	Community Park
D	21.8	1,002 feet	Oak Flats Historic Park

This drainage plan would not result in a significant alteration of the main creeks, major watershed divides, or the basic drainage direction of the smaller tributary creeks. However, the undergrounding of portions of the smaller tributary creeks would represent a significantly alteration from their existing conditions.

Increased Surface Runoff

According to the estimations and calculations prepared by the project applicant, development of Phase 1 could result in the creation of approximately 365 acres of impervious surfaces, roughly 18 percent of the total Phase 1 area. Table IV.C-C summarizes the total acres of various land uses proposed in Phase 1, their estimated impervious surface factors, and the total created impervious surface acreage. Without mitigation, precipitation over the developed areas would result in an additional 309 acre-feet of surface runoff leaving the site annually, an increase in site runoff between 9 and 14 percent over existing conditions. Although this increase in surface runoff

Table IV.C-C - Phase 1 Impervious Surfaces Analysis

Land Use - Type	Percent Impervious	Total Acreage	Impervious Acreage
RESIDENTIAL	32%	683	219.7
Multiple family	65%	28	18.2
Attached single family	65%	60	39.0
"O" side yard or "Z" lots	60%	25	15.0
Single family			
(R-1 - 10,000 sq. ft.)	35%	140	49.0
(R-1 - 20,000 sq. ft.)	25%	340	85.0
(R-1 - 40,000 sq. ft.)	15%	90	13.5
EMPLOYMENT AREAS	63%	51	32.2
Shopping, town center, restaurant	70%	23	16.1
Hotel	60%	13	7.8
Golf, health, tennis	50%	4	2.0
Winery	50%	3	1.5
Public facilities	60%	8	4.8
ROAD SYSTEM	68%	166	122.5
Parkway	75%	62	46.5
Collector streets	65%	73	47.4
Cul-de-sacs	60%	31	18.6
TOTAL PHASE 1	41%	900	365
PHASE 1 TOTAL ACREAGE	18%	2,000	365

NOTE: These estimates prepared by Diablo Grande are considered to be conservative, and detailed engineering and architectural designs will probably lead to further reductions in runoff, e.g., up to four feet of an impervious surface parking spaces can be used for landscaping).

represents a significant alteration to the existing runoff value from the Phase 1 area, it would not represent a significant alteration when compared to the total runoff over the entire Salado Creek watershed. The increased surface water runoff would not be expected to significantly affect groundwater recharge areas. As noted under the overall site discussion, NPDES permits would be required for project construction and for operation of all proposed land uses' discharge of stormwater.

If not adequately mitigated, the increased surface runoff could significantly impact the physical condition of Salado creek and the unnamed tributary along the northern portion of the site where outfall structures are proposed. Accelerated flows could cause embankment undercutting and downstream scouring near bends and stream confluences.

Flooding

The additional surface water runoff generated from Phase 1 development during large precipitation events could cause localized flooding on-site along Salado Creek, the unnamed tributary and/or near inlet structures if the drainage system is not adequately designed and sized to handle expectant runoff. Increased runoff could cumulatively contribute to downstream flood problems near I-5.

The Preliminary Storm Water Management Study perpared by Rochester & Associates indicates that the incorporation of the four aforementioned detention basins would slighly increase the peak flows along Salado Creek during the two- and five-year storm events and greatly decrease the amount of runoff during the 10-, 25-, 50-, and 100-year storm events. Refer to the second column of Table IV.C-B for the estimated runoff values post Phase 1 development. Thus, with the incorporation of these detention ponds, the cumulative impacts of flood waters arriving at the I-5 crossings would not increase as a result of development. As future developments are delineated in phases upstream of Phase 1, additional detention basins and upgrading of Phase 1 drainage system improvements would be necessary to ensure both on- and off-site flood prevention.

Adverse Water Quality Effects.

As noted under the overall site discussion, potential water quality impacts could result from excessive sedimentation of creeks during grading activities, if adequate erosion control measures were not incorporated. Increased surface runoff rates from the developed Phase 1 site could continue to cause creek sedimentation as the result of erosion within unprotected embankments. Sedimentation of Salado Creek would add slightly to the sedimentation in the San Joaquin River.

Stormwater runoff from Phase 1 would be expected to contain urban pollutants such as oil, grease, exhaust and rubber from paved surface areas and other common urban pollutants such as fertilizers, pesticides, and animal waste from landscaped and/or open areas.

The proposed land use with the greatest potential adverse water quality impacts would be the proposed Salado and Oak Flat golf courses which are proposed adjacent to the Phase 1 waterways and which require the most extensive maintenance. The potential impacts would be a function of the types and amounts of chemicals used, the timing and location of applications, and related weather conditions. Without provision of soil amendments, the sandy soil in the proposed golf course areas increases the likelihood of groundwater contamination through leaching. In addition, excess amounts of standing water such as ponds, lakes and streams which are often incorporated into golf course designs may serve to increase the need for on-site pesticide use to control mosquitos.

The water quality of imported water which is to be used for irrigation purposes could also impact local water quality. As described in the Public Services and Utilities section of this report, the source of water for irrigation would come from a groundwater well near Marshall Road south of Patterson and from the treated effluent water generated from the on-site wastewater treatment plants. As shown in Table IV.C-D, an irrigation water analysis report prepared for the off-site groundwater source indicates that the water is suitable for irrigation and potable uses. Although still an acceptable level for drinking purposes, this water source has a sulphate level higher than recommended by the Department of Health and Safety. According to the Specific Plan the effluent produced from the project wastewater treatment facilities would meet the requirements of Title 22, Division 4 of the California Administrative Code (Title 22), and the Regional Water Quality Control Board (RWQCB). Effluent produced not needed for irrigation would be discharged into nearby streams.

Estate development within the Conservation Areas would be outside the sanitary sewer service realm. Property owners of these lots would be required to comply with Measure X and all applicable standards enforced by the Stanislaus County Department of Environmental Resources regarding tank location and design. Depending on the actual location of each estate lot, the existing slope, depth of soil, and other soil characteristics may not be suitable for septic tank systems. Malfunctioning septic systems could result in local surface water and groundwater quality impacts from increased concentrations of nitrate and chloroforms.

All project-related stormwater runoff would be subject to NPDES permit requirements.

Table IV.C-D: Irrigation Water Analysis Report for the Marshall Road Groundwater Source

Report Number: W212-5
Date of Report: August 6, 1991
Report Preparer: A & L Western Agricultural Laboratories

Sample Ident.	Lab No.	Sodium Meq/Liter Na	Calcium Meq/Liter Ca	Magnesium Meq/Liter Mg	Carbonate Meq/Liter CO_3	Bicarbonate Meq/Liter HCO_3	Chloride Meq/Liter Cl	(E.C.) Conductivity mmhos/cm	pH
Well Marshall & Davis	62398	12.2	6.2	8.2	0	3.8	2.8	2.25	8.0

Sample Ident.	Phosphorus ppm P	Potassium ppm K	Nitrate ppm NO_3	Sulfate ppm SO_4	Boron ppm B	Total Dissolved Solids ppm	Adj. S.A.R.	Langlier Saturation Index	Total Coliform
Well Marshall & Davis	0.09	4.6	10	900	0.88	1594	5.10	___	<2.2 MPN/100 ml

Source: Bookman-Edmonston Engineering, Inc., November, 1991.

Changes in Local Groundwater Quantity

Local groundwater levels could fluctuate as a result of Phase 1 development. Impervious surface coverage would inhibit local groundwater recharge. This impact however, could be offset by project irrigation of landscaping, which could serve to recharge other groundwater table areas. These local changes in groundwater elevations would not be significant.

Primary Access Road

Drainage Pattern Alteration

Since the proposed Primary Access Road follows the course of two intermittent streams and traverses the head of another, the construction of the road has the potential to significantly alter the present drainage pattern. Unless the roadway is constructed in such a way as to allow adequate space for the flow of stormwater alongside the road and/or the flow of stormwater underneath the road, towards their existing flow directions, the existing drainage pattern could be severely altered by the redistribution of runoff waters within the existing watersheds, increased incision of downstream embankments from increased runoff, and/or localized flooding.

Increased Surface Runoff

The construction of the proposed Primary Access Road would increase the amount of impervious surface acreage. The surface water runoff over the entire Primary Access Road right-of-way is expected to increase by approximately 75 percent over existing runoff figures. If not adequately mitigated, the increased runoff could significantly impact the physical condition of the intermittent streams through which the proposed roadway follows and traverses. Accelerated flows could cause stream and road embankment undercutting and downstream scouring near bends and stream confluences.

Flooding

The additional surface runoff generated by the Primary Access Road impervious surface area could cause localized flooding along the roadway, and at culverts if the drainage system is not adequately designed and sized to handle expectant runoff.

Adverse Water Quality Effects

As noted under the overall site discussion, potential water quality impacts could result from excessive sedimentation of creeks during grading activities,

if adequate erosion control measures were not incorporated. Increased surface runoff rates from the Primary Access Road area could cause creek sedimentation as the result of erosion within unprotected embankments, cumulatively adding to the sedimentation in the San Joaquin River.

Stormwater runoff from the Primary Access Road paved surface would be expected to contain urban pollutants such as oil, grease, exhaust and rubber. If landscaping is proposed alongside the roadway, additional pollutants such as fertilizers, pesticides and herbicides may also be present in the runoff.

All project-related stormwater runoff would be subject to NPDES permit requirements.

Groundwater Quality

Development of the proposed Primary Access Road is not expected to significantly impact the local groundwater recharge.

Mitigation Measures

Overall Site

Increased Surface Runoff

1. A NPDES permit for stormwater discharge shall be obtained from the RWQCB prior to the onset of construction, as required. Additional NPDES permits for proposed land uses shall be obtained prior to their operation. The project shall provide measures and practices to prevent pollution in addition to a stormwater discharge monitoring program to ensure compliance with State and federal water quality objectives.

2. Although it was noted that the expected amount of surface runoff generated would not be significant, when compared with the total annual surface runoff from the watersheds, the increased flows could impact the conditions of receiving creeks. In order to offset this impact the amount of created impervious surfaces should be minimized.

3. The final project drainage systems shall be designed to control runoff volumes and velocities efficiently both during and after construction. Flow control measures could include terraces, detention basins, subsurface drains, berms and other diversions to keep water off exposed slopes and control water velocity.

4. Erosion control measures shall be provided along project creeks in the vicinities of outfall structures to protect against erosion from increased surface flows. The level of erosion control needed should be

determined by the project engineer and should not significnatly detract from the creek's biotic value.

5. All project drainage systems shall be designed and constructed in conformance with the Stanislaus County Drainage Ordinance, and FEMA and RWQCB regulations.

6. Landscape irrigation practices shall be designed to maximize infiltration of surface water and minimize runoff.

Flooding

7. Prior to approval of project drainage plans, floodplain studies shall be conducted along Salado, Crow, and Orestimba creeks. Study findings should be incorporated and mitigated (if necessary) in the final drainage plans.

8. The final project drainage plans shall be designed to ensure no net increase in 100-year storm flows downstream of the site near I-5. Drainage plans for project phases constructed upstream of existing phases should include the reevaluation of the existing phase drainage system and the upgrading (if necessary) should the system not be of adequate size to handle additional flows from upstream future phases. Upgrading measures could include the replacement of smaller-sized drainage pipes with pipes of larger diameter, the construction of additional detention basins, and/or the enlargement of existing detention basins.

9. Project structures, utilities, and roadways shall be located outside the 100-year floodplain.

10. The project drainage system shall be adequately maintained and cleaned on a regular basis to ensure efficient transport of stormwater through the project site and to avoid localized flooding due to debris blockage. Sections of project creeks that are too narrow to allow proper flow of expected runoff should be widened and protected from erosion where necessary. The appropriate U.S. Army Corps and State Fish and Game Department permits should be obtained prior to any creek improvements.

Adverse Water Quality Impacts

Grading.

11. Grading should be confined to the dry season, or be mitigated as summarized in mitigation 13 below.

12. The geotechnical report should include the exploration for possible subsurface hazardous materials such as buried fuel or septic tanks. Appropriate remedial measures should be taken prior to the onset of any grading activities.

13. Interim and final erosion control plans should be prepared prior to approval of grading permits. Temporary measures could include the construction of berms and siltation fences that would direct runoff to siltation ponds, the covering of soil piles, and the covering of bare slopes with hydroseed. Final erosion control plans would include stable terraced slopes, retaining walls, an adequate drainage plan, and permanent project landscaping. Part of the erosion control plans should include the preservation of as much natural vegetation as feasible and the maintenance of natural vegetation along stream channels. If grading is expected to continue into the wet season, a special wet weather erosion control plan should be prepared and approved. The erosion control plans should be in conformance with the County grading and building ordinances and the RWQCB's NPDES construction permit.

Urban Pollutants.

14. All project runoff collected within developed areas should be directed to the appropriate drainage collector.

15. To help reduce the amount of runoff containing urban pollutants, streets and parking areas should be frequently cleaned using street sweeping equipment, and the collected material properly disposed.

Irrigation Water.

16. The project drainage system catch basins should be complete with oil and grease traps to filter out the heavier pollutants as determined by the County Department of Public Works. The traps should be frequently cleaned.

17. To ensure the prevention of potential surface and groundwater quality impacts from irrigation practices, the water quality of the Marshall Road area groundwater well should be periodically monitored for compliance with DHS and RWQCB water quality objectives. In addition, the treated effluent produced at the project wastewater treatment facilities should be regularly monitored as stipulated in discharge permits. Any water source that does not meet the water quality standards for irrigation purposes should be treated prior to discharge.

Golf Course Chemical Usage.

18. A site-specific integrated golf course management program should be prepared to limit water quality impacts of the golf courses. This program should include detailed assessments of potential impacts to water quality and risk of accidental spills, and provide appropriate management practices to minimize the impacts.

19. A list of all fertilizers and pesticides proposed for use in the management plan should be submitted to the Department of Agriculture for review and comment. The description should include the types of compounds to be used, the amounts to be applied, and the form of application. The golf course management description should be submitted on a monthly basis for as long as chemical usage is proposed.

20. Use of any pesticides, herbicides, fungicides, or insecticides in project golf course management activities which are included on official State or federal lists of restricted materials will require issuance of a Restrictive Materials Permit. These permits are issued in by the Agricultural Commissioner. All materials on this list will be subject to special use restrictions as a condition of permit issuance to ensure against significant health risks.

21. To reduce the need for fertilizers and pesticides, the golf course areas that require relatively high maintenance (greens, tees and landing areas) should be minimized. In addition, the amount of standing water areas (ponds, streams, lakes) should be minimized to reduce the need for insecticides.

22. Native trees and grasses should be incorporated into the golf course plan to the extent feasible in order to reduce the water, nutrient, and pesticide application requirements.

23. Surface runoff from the heavily managed areas should be directed away from creeks and ponds, into the nearest storm drain facility. Storm drains should include oil and grease traps (as determined by the County Department of Public Works) to filter out some of the heavier petroleum-based golf course chemicals.

24. Golf course soils (especially sand) should be amended with organic matter to better retain nitrogen and water.

25. Water conservation practices should be incorporated into the golf course management plan to both conserve irrigation water and reduce leaching. One such water conservation method may include the provision of a computerized irrigation system with sensors to minimize overwatering.

26. Slow release nitrogen sources should be used to reduce leaching. The use of more soluble nitrogen sources should be limited to spring and/or early summer months to avoid periods when soils are cold, plant metabolism is low, and water movement is high. Soluble nitrogen sources should be applied with very light, but frequent, surface applications only.

27. Non-selective herbicides that affect all plants in the contact area should be limited to spot spraying as needed to kill only the target vegetation and to reduce the chemical use.

28. The use of fungicides should be generally limited to periods when temperatures are still cool and during a time of little rainfall to increase their effectiveness and decrease the need for future applications. Irrigation water should not be applied within 24 hours of most types of fungicides applications, unless recommended differently by the manufacturer.

29. Chemical applications should be reduced and/or prohibited during windy periods. Application equipment and pesticide formulations that minimize pesticide drift should be selected for use in the management plan. Spray applicators should use low pressure nozzles and keep the spray nozzle close to the target.

30. All golf course chemicals should be properly stored in accordance with the Department of Agriculture and the Office of Safety and Health Administration requirements. Storage facilities should be constructed with impermeable floors and berms. All pesticide and fertilizer mixing and loading should be restricted to areas having impermeable floors and berms.

31. Maintenance employees should be properly trained in the storage, handling, and clean up of all EPA-approved chemicals prior to application.

32. The effectiveness of the golf course management plan should be verified through periodic monitoring of nearby surface water and groundwater quality. Sampling should begin prior to construction to provide background water quality data and should continue during construction and after construction (for a period of time to be decided by the regulatory bodies) to assure that the project is in compliance with DHS and RWQCB water quality objectives. If necessary, the plan should be modified to ensure modification.

Septic Systems.

33. Site-specific soil studies should be prepared for each estate lot proposed outside the sanitary sewer service realm to determine if soil

and site topography could support a septic system and leach field. Sites where soil is determined to be too shallow, corrosive or clayey and where slopes are too steep to ensure proper septic system operations should either be connected to the proposed sanitary sewer service or not be developed.

Phase 1

Mitigation measures recommended for the development of Phase 1 would be the same as those provided for the overall site. No further mitigation measures are suggested; these measures would mitigate the impact to below a level of significance.

D. VEGETATION AND WILDLIFE

Setting

The project site is located in the inner coast range near the western boundary of the San Joaquin Valley. The elevation of the site ranges from 250 feet (msl) along the entry road to over 2,600 feet at Mike's Peak. Much of the site has been heavily grazed for many years and the vegetation is dominated by non-native annual grasses and blue oak woodland. Chaparral and sage scrub communities are present along the western boundary of the site and on some south-facing slopes. Habitats of special concern present on the site include blue oak woodland, riparian areas, native bunchgrass grassland, and rock outcrops. The site provided habitat for a variety of plant and wildlife species and supports or potentially supports 15 plant species of special concern and 17 wildlife species of special concern.

Study Methods

Pre-field Investigations

Prior to conducting the field surveys, LSA consulted with biologists at the California Department of Fish and Game (DFG), U.S. Fish and Wildlife Service, and the California Natural Diversity Data Base (CNDDB, 1989) to determine the potential for the presence of rare, threatened or endangered species on the project site.

Field Surveys

A survey of the Phase 1 Area occurred on February 13 and 14, 1990. The remainder of the project site was surveyed on April 26 and 27, 1990.

Surveys of the Phase 1 Area involved walking and driving throughout portions of the project site, recording vegetation types present, plant and wildlife species observed, and the presence of habitats of special concern.

The survey of the remainder of the project site was a preliminary assessment. The Overall Site was accessed where possible by four-wheel drive vehicle, and general information on vegetation types, plant and wildlife species observed, and the potential for habitats and species of special concern occurring on the site were recorded. The proposed primary access road area between Del Puerto Canyon Road and Oak Flat Road was not included in this preliminary survey but is being surveyed in the spring of 1992.

Surveys for the presence of San Joaquin kit fox in the Phase 1 Area, Entry Area, and Oak Flat Road occurred in July and August of 1990 (LSA, 1991). The proposed primary access road area between Del Puerto Canyon Road and Oak Flat Road was surveyed in June and July, 1992. The remainder of the overall site was not included in this survey.

A combination of three survey techniques were used to investigate the potential presence of San Joaquin kit fox, following the San Joaquin kit fox survey methodology recommended by DFG, Region 4 (DFG, 1990). These included: (1) scent stations; (2) spotlighting surveys; and (3) ground transects.

Vegetation

Overall Site

A number of plant communities are present in the Overall Site as described in Holland (1986). The Overall Site is dominated by two plant communities: (1) grassland and (2) blue oak woodland. Within most of the blue oak woodland, grass species are the dominant understory vegetation. Other communities present include: (1) northern mixed chaparral; (2) chamise chaparral; (3) Diablan sage scrub; (4) digger pine-oak woodland; (5) riparian vegetation; and (6) rock outcrops. Several plant communities and habitats are present on the Overall Site which are of special interest. These include: (1) blue oak woodland; (2) riparian vegetation; (3) native bunchgrass grassland; and (4) rock outcrops.

Grassland. Non-native grassland occurs throughout most of the Overall Site. It is present as the dominant understory vegetation within the oak woodlands. The site has been heavily grazed, as indicated by the short grass height, patches of barren ground, and the lack of perennial vegetation. The non-native grassland is a mixture of species associations in which different herbaceous species dominate, depending on environmental variables such as grazing history, moisture, slope exposure, and steepness. Some areas consist of almost pure stands of one species, while others are mixed or form a mosaic of small patches of pure stands mixed together. These species associations include: (1) non-native grassland; (2) ruderal; and (3) native bunchgrass.

Non-Native Grassland. The non-native grassland association contains a combination of grasses and forbs and is dominated by introduced annual grasses such as wild oats (*Avena* sp.), soft chess (*Bromus mollis*), and red brome (*Bromus rubens*). A number of species of forbs are associated with the grassland. These can occur as individual plants or in patches which form a cover of up to 90 percent. Forbs present include filaree (*Erodium* sp.), fiddleneck (*Amsinckia* sp.), peppergrass (*Lepidium nitidum*), goldfields (*Lasthenia chrysostoma*), sticky tarweed (*Holocarpha virgata*), blue dicks (*Dichelostemma pulchellum*), locoweed (*Astragalus* sp.), turkey mullein (*Eremocarpus setigerus*), lupine (*Lupinus* sp.), clarkia (*Clarkia* sp.), and gumplant (*Grindelia* sp.).

Ruderal. Ruderal vegetation includes those species which are able grow in disturbed areas. In the Overall Site, ruderal vegetation is present in areas that have been heavily trampled by livestock, including areas around stock ponds and drainages. Vegetation in these ruderal

areas is dominated by broadleaf plants including filaree, horehound (*Marrubium vulgare*), London rocket (*Sysimbrium irio*), nettle (*Urtica* sp.), mallow (*Malva* sp.), shortpod mustard (*Brassica geniculata*), and shepherd's purse (*Capsella bursa-pastoris*).

Native Bunchgrass. Native valley needlegrass grassland is dominated by native perennial bunchgrasses. Native bunchgrass is not common because of competition from introduced annual grasses and heavy grazing. Native bunchgrass was not observed during the preliminary survey of the Overall Site. However, it was found during the more intensive surveys of the Phase 1 Area. It is likely to be found when more intensive surveys are performed throughout the project site in areas which are protected from livestock grazing.

Needlegrass grassland is a sensitive plant community which was formerly common in California before the introduction of European annual grasses and grazing animals.

Blue Oak Woodland. The blue oak woodland community is present in much of the Overall Site. The understory vegetation is dominated by annual grasses. The dominant tree in the blue oak woodland is the blue oak (*Quercus douglasii*). Where the canopy of the individual trees do not touch, the community is classified as blue oak savanna. The trees range from 15 to 35 feet in height and from one to 24 inches in diameter at breast height (DBH). Blue oaks form denser stands on north and east facing slopes, and more open savannas on the west and south facing slopes. Blue oaks tend to be absent from the floors of the small valleys present in the project site. Gooseberry scrub (*Ribes* sp.) forms small, isolated stands up to an acre in size within the oak woodland.

Blue oak woodland is a sensitive plant community because Statewide stands of blue oak are exhibiting limited regeneration. Consistent with this statewide trend, few seedling or sapling blue oaks were observed during the site visit.

Northern Mixed Chaparral. Northern mixed chaparral is present as discontinuous, dense bands of shrubs dominated by manzanita (*Arctostaphylos* sp.) on the steeper slopes along the western boundary of the Overall Site. Associated with the manzanita is chamise (*Adenostoma fasciculatum*). Other shrubs often occurring in the mixed chaparral include scrub oak (*Quercus dumosa*) and ceanothus (*Ceanothus* sp.). Northern mixed chaparral is adapted to repeated fires and forms dense, often nearly impenetrable stands, usually on dry, rocky, often steep slopes with little soil. Little or no understory vegetation is present in these stands of chaparral.

Chamise Chaparral. Chamise chaparral is present in the Overall Site, in small isolated stands associated with the northern mixed chaparral. The chamise chaparral is dominated by a uniform cover of chamise (*Adenostoma*

fasciculatum). Like the mixed chaparral, the chamise chaparral is adapted to repeated fire and has little herbaceous understory. The chamise chaparral tends to occur at lower elevations and on drier soils than the mixed chaparral.

Diablan Sage Scrub. Diablan sage scrub present in the Overall Site occurs as small isolated stands usually associated with shallow, rocky soils, typically on dry south facing slopes. Diablan sage scrub is dominated by California sage brush (*Artemisia californica*), black sage (*Salvia mellifera*), and buckwheat (*Eriogonum fasciculatum*). Most of the sage scrub observed within the site is dominated by uniform stands of California sage brush with some buckwheat. These uniform stands form low, open stands from one to three feet in height. Sage scrub stands dominated by black sage are present along Oak Flat Road. Understory vegetation includes annual grass species. A component of Diablan sage scrub, narrowleaf goldenbush (*Haplopappus linearifolius*), forms small stands scattered throughout the site in the non-native grassland.

Digger Pine - Oak Woodland. Digger pine - oak woodland occurs in the steeper, western portion of the Overall Site. Digger pines (*Pinus sabiniana*) occur as individuals or in very small isolated stands within the blue oak woodland. Understory vegetation is dominated by non-native grassland. California juniper (*Juniperus californica*), occur as individual trees, associated with the digger pines and blue oaks.

Riparian Areas. Riparian areas found in the project site include: (1) intermittent creeks; (2) stock ponds; and (3) springs.

Creeks. The major drainages present in the Overall Site include Orestimba Creek, Crow Creek, and Salado Creek. These three drainages are intermittent streams which flow for a period of several months during and after the winter rainy season. A number of ephemeral drainages, which flow only during rainfall events, are tributary to these three streams. Vegetation present along Salado Creek in the Phase 1 Area includes small stands of valley oak (*Quercus lobata*), willows (*Salix* sp.) and cottonwood (*Populus fremontii*). It is likely that Crow and Orestimba Creeks support similar types of riparian vegetation as well as other riparian species such as California sycamore (*Platanus rasemosa*). Vegetation present along most of the ephemeral drainages is dominated by grassland and/or blue oak woodland, with some ruderal vegetation present. Interior live oak (*Quercus wislizenii*) is present along a few of the drainages.

Orestimba Creek was not surveyed during the site visit, and only a small reach of Crow Creek was surveyed.

Stock Ponds. Twenty stock ponds were located during the preliminary survey of the Overall Site, and a number of other stock ponds are shown on topographic maps of the area. Most of the stock ponds are reservoirs formed by small earthen dams in the drainages. Several stock ponds held water at the time of the site visit. Vegetation around most of the ponds is dominated by grasses and ruderal vegetation and is sparse due to trampling by livestock. Riparian vegetation associated with the ponds include very small stands of willow at three of the stock ponds visited.

Springs. Several springs appear on topographic maps of the the project site. The only spring observed was Salt Grass Spring in the northwestern portion of the Overall Site. Salt Grass Spring is alkaline, with salt encrusted soils present in the vicinity of the spring. Water fills a man-made hole approximately six by six feet located on the east facing slope, approximately 100 feet above the Salt Grass Canyon drainage. Vegetation associated with the spring include salt grass (*Distichlis spicata*), which dominates the slope below the spring, wild oats, barley (*Hordeum* sp.), brome (*Bromus* sp.), and goldfields. Trees including buckeye (*Aesculus californica*), blue oak, digger pine, and California juniper grow in the vicinity of the spring.

Wetland herbaceous plants growing in small patches in or near the drainages, ponds and in the vicinity of Salt Grass Springs include rush (*Juncus* sp.), rabbitfoot grass (*Polypogon monspeliensis*), and duckweed (*Lemna* sp.).

Riparian habitats are of special concern because of their importance to wildlife and because losses of riparian habitat in California exceed 90 percent.

The U.S. Army Corps of Engineers (Corps) has jurisdiction over "waters of the United States and adjacent wetlands" under Section 404 of the Clean Water Act, which authorizes the Corps to regulate discharge of materials in "waters of the United States and adjacent wetlands." Salado, Crow, and Orestimba Creeks, their tributaries, the stock ponds and springs present in the Overall and Phase 1 areas are subject to Corps jurisdiction. These riparian areas are also subject to the jurisdiction of the California Department of Fish and Game (DFG) under Section 1603 of the Fish and Game Code.

Rock Outcrops. Two different types of rock outcrops are present in the project site, (1) surface rock outcrops, which are characterized by areas of exposed bedrock covered with patches of a thin layer of soil; and (2), cliff forming outcrops, which are characterized by large masses of bedrock that protrude from a few feet to more than 50 feet in height.

Rock outcrops are important biological features because they provide a diversity of habitats for plant and wildlife species. A high diversity of native plants, including plant species of special concern, are often found in

association with shallow soils, exposed bedrock, and massive rock outcrops. A diversity of small mammal species such as bats, deer mice and wood rats are often associated with rock outcrops. Rock outcrops are also used as observation posts by predators such as gray fox, bobcat, golden eagle, and prairie falcon in search for prey species such as California ground squirrel and desert cottontail. Several species of raptors, including golden eagle and prairie falcon, nest on ledges on cliff faces. Other wildlife species expected to breed in the outcrops include western fence lizard, barn owl, Say's phoebe, cliff swallow, rock wren, and bats.

Habitats of Special Concern. Several habitat types of special concern are present on the Overall Site, including (1) blue oak woodland; (2) riparian areas, including Salado, Crow and Orestimba Creeks and other drainages, stock ponds, and springs; (3) rock outcrops; and (4) potential stands of native bunchgrass grassland.

Phase 1 Area

The vegetation of the Phase 1 Area is primarily non-native grassland and oak woodland. Oak woodland occurs in patches on the east- and north-facing hillsides, in canyons, and along drainages. Habitats which are present in the Overall Site and absent in the Phase 1 Area include northern mixed chaparral, chamise chaparral. Several vegetation and habitat types of special interest occur in and adjacent to the Phase 1 Area, including (1) riparian vegetation along creeks and around stock ponds; (2) blue oak woodland; (3) rock outcrops and shallow soils and small patches of scrub associated with the rock outcrops; (4) native bunchgrass grassland; and (5) alkali areas associated with drainages.

Grassland.

Non-Native Grassland. Non-native grassland in the Phase 1 Area is similar to non-native grassland present in the Overall Site in structure and composition of plant species. This habitat is present throughout the area, forming the dominant understory vegetation in the blue oak woodland.

Ruderal. Ruderal vegetation present in the Phase 1 Area is similar to that found in the Overall Site.

Native Bunchgrass. Valley needlegrass grassland was found growing in the Phase 1 Area in very small amounts, most commonly along Salado Creek and intermittent drainages tributary to Salado Creek, in areas where livestock could not easily reach. They are not common due to competition from non-native annual grasses and heavy cattle grazing. We observed two species of perennial bunchgrasses on the

site. Purple needlegrass (*Stipa pulchra*) grows on a terrace along Salado Creek, downstream from the old barn in the center of the valley. Needlegrass is a sensitive plant community which was formerly common in California before the introduction of annual grasses and livestock grazing. A different species of bunchgrass grows in small patches throughout the site and in greater concentrations on terraces along Salado Creek. It could not be identified at the time of field surveys because it was not yet flowering. Flowering would occur in April and May.

Blue Oak Woodland. The blue oak woodland present in the Phase 1 Area is composed almost exclusively of blue oaks (*Quercus douglasii*). The trees grow in park-like stands with their branches and crowns growing close together. Where blue oaks are widely spaced, the woodland is classified as oak savanna. The trees range from 15 to 35 feet tall and are 1 to 24 inches DBH. Blue oak woodland is found growing on almost all of the hills surrounding the Oak Flat Valley and is largely absent from the valley floor.

Livestock grazing has affected the establishment of young oak trees. We observed few regenerating oaks in the form of seedlings or saplings during the site visit. The understory vegetation is dominated by annual grassland grasses and forbs described in the grassland section above.

Riparian Areas. Riparian habitat present the Phase 1 Area include Salado Creek and drainages tributary to Salado Creek, and stock ponds. Salado Creek is an intermittent stream in which water is present in the winter and spring, during and after the rainy season. The upstream portion of the creek is dry, but there is flowing water which pools downstream between the two main tributaries. Salado Creek varies between three and 30 feet wide. The channel meanders across the flood plain and is composed of pools and riffles. Pool depth varies from three inches to three feet and the pools are about three to 15 feet wide and 35 feet long. The depth of the riffles varies between 0.5 and three inches.

Two main ephemeral dainages are tributary to Salado Creek in the Phase 1 Area. Their channels are gullied upstream, becoming well-defined channels in their middle and lower portions. These drainages are dry and probably only flow during rainy weather. Vegetation adjacent to the drainages is taller and denser than on adjacent slopes and consists mainly of upland species.

There are nine stock ponds within the Phase 1 Area. Two of the stock ponds contained water and the others were dry at the time of the site visit. The pond adjacent to the ranch house receives pumped water. Vegetation around this pond consists of grasses and is sparse due to trampling by livestock. A few clumps of cattails grow in the pond. The second pond is formed by a dam in Salado Creek located at the northeast corner of the project site, adjacent to Oak Flat Road. Riparian vegetation associated with this pond includes willows (*Salix* sp.) and a few clumps of cattails. Livestock trampling

around the pond was heavy and much of the shoreline was devoid of vegetation.

Riparian vegetation grows along Salado Creek in the northern portion of the Phase 1 Area, in the lower portions of its two major tributaries, around a small portion of the edge of the ranch house, and at the edges of a pond located at the northeast end of the Phase 1 Area. Blue oak, although not a riparian species, is the most common tree species found in the riparian zone. These trees are from 20 to 30 feet tall and are 8 to 18 inches DBH. Spacing between the crowns of the blue oaks varies from around 50 to several hundred feet. Plants growing between openings in the tree canopy along the creek banks are not riparian-dependent species. Dominant species include sticky tarweed, bur clover (*Medicago polymorpha*), California goldenrod (*Solidago californica*), narrow-leaved milkweed (*Asclepias fascicularis*), heliotrope (*Heliotropium curassavicum*), mustard (*Brassica* spp.), miner's lettuce (*Montia perfoliata*), and fiddleneck.

Several valley oaks are present along the terraces of Salado Creek, downstream from the old barn. Only one Fremont cottonwood (*Populus fremontii*) is present in the riparian habitat in the Phase 1 Area and is located along the northern tributary to Salado Creek.

Shrubs present in the riparian area are mule fat (*Baccharis viminea*), a species often associated with wetlands, and upland species such as California sagebrush (*Artemesia californica*) and matchweed (*Gutierrezia californica*). Upland shrub species were found with mule fat in the creek bottom as well as on the creek banks. Wetland herbaceous plants growing in small patches in or at the edges of ponds and along Salado Creek and its tributaries consist of spikerush (*Eleocharis* sp.), rabbitfoot grass, cattail (*Typha* sp.), rush (*Juncus* sp.), duckweed (*Lemna* sp.) and bulrush (*Scirpus* sp.). Other dominant herbaceous plants growing in the water or at its edge include curly dock (*Rumex crispus*), bermuda grass (*Cynodon dactylon*), perennial rye (*Lolium perenne*), salt grass, and nettle. Spikerush also grows in a few isolated clumps on terraces above and in the creek.

The riparian areas have been degraded by livestock grazing and trampling, as evidenced by a lack of species and structural diversity. All of the trees observed on-site were mature trees with little evidence of regeneration. There were a few seedlings and no sapling trees present.

Salado Creek and drainages tributary to Salado Creek, the stock ponds, and alkali seeps are subject to the Corps and DFG jurisdiction.

Diablan Sage Scrub. Small stands of scrub species which are an element of the Diablan sage scrub community are mixed with grassland on northwest to northeast slopes and ridgetops. This habitat is associated with rock outcrops and shallow soils on gradual to steep slopes. Matchweed and sticky tarweed are the primary shrub species, although several rock outcrops at the southwest end of the project site were dominated by gooseberry shrubs and California figwort (*Scrophularia californica*). Herbaceous species common to the sage

scrub include locoweed, horehound and nettle. Along Oak Flat Road, stands of Diablan sage scrub are dominated by black sage.

Alkali Areas. The soil of alkali areas contains a high concentration of sodium chloride (salt) or sodium hydroxide (base). Alkali areas have a characteristic flora that has adapted to the presence of high concentrations of salt or base. Non-native grasses and many other plants are not able to grow in alkali areas due to the presence of these high concentrations. Deposits of alkaline soils are present along the banks of Salado Creek immediately upstream of the pond on the northeast property boundary and in several areas in and near Salado Creek along Oak Flat Road. Saltgrass grows in areas where the alkali is most concentrated.

Habitats of Special Concern. Several special interest habitat types are present in the Phase 1 Area, including: (1) blue oak woodland; (2) riparian areas including Salado Creek and tributaries to the creek and stock ponds; (3) native bunchgrass grassland; (4) rock outcrops; and (5) alkali areas. The mosaic of these habitats and the presence of water increases the diversity of plant and animal species on the site.

Primary Access Road

Vegetation along the primary access road corridor is of several types. The predominant vegetation of the hillsides and valley floors is non-native Grassland with a few side canyons containing tall herbaceous annuals. Non-native Grasslands are characterized by a dense cover of herbaceous annuals, dominated by non-native grasses, such as wild oats (*Avena* spp.) and bromgrasses (*Bromus* spp.). The small areas of tall herbaceous annuals are characterized by mustard (*Brassica* spp.), with an herbaceous understory essentially similar to the Non-native Grassland.

Alkaline wetlands, primarily Alkali Meadow and Alkali Grassland, are present in the northern portion of the road corridor along the valley floor of the main drainage. The Alkaline Meadows are characterized by perennial grasses including saltgrass (*Distichlis spicata*) an alkali sacaton (*Sporobolus airoides*). The Alkali Grassland is characterized by salt-tolerant species dominated by grasses such as barley (*Hordeum* spp.) and rye (*Lolium* spp.), and often with a mixture of salt-tolerant wildflowers, such as goldfields (*Lasthenia* spp.).

Wildlife

Overall Site

A variety of wildlife species inhabit the various habitats on the Overall Site. In general, most of these species would be expected to occur in more than one vegetation type. The following discussion describes those species that

would be expected to commonly occur in the habitats present in the project site.

Grassland. The relatively dry nature of the grassland provides habitat for relatively few wildlife species. Wildlife species expected include reptiles, birds, and mammals. Reptiles either observed or expected in the Overall Site include western fence lizard, side-blotched lizard, coast horned lizard, gopher snake, common kingsnake, racer, long-nosed snake, and western rattlesnake.

Birds found within the project site will vary with the seasons, with some species present year-around, some present only during the summer or winter months, and some present for brief periods of time during spring and/or fall migration. Birds either observed or expected in the grassland in the Overall Site include: (1) shorebirds; (2) seed and fruit feeders; (3) insectivores; (4) omnivores; and (5) predators. Shorebirds include killdeer and long-billed curlew. Granivores and frugivores are birds which feed on seeds and fruit, respectively, and include savannah sparrow, house finch, and lesser goldfinch. Insectivorous species include Say's phoebe, western kingbird, horned lark, American pipit, and western meadowlark. Omnivores feed equally on plant and animal food, include American robin. Predatory birds include turkey vulture, red-tailed hawk, golden eagle, American kestrel, and prairie falcon. All of the predatory birds use the grassland for foraging.

Small mammals either observed or expected in the Overall Site include desert cottontail, black-tailed hare, California ground squirrel, Botta's pocket gopher, Heermann kangaroo rat, harvest mouse, and California vole. Large mammals observed or expected in the grassland include coyote, black-tailed deer, striped skunk, and American badger. The large mammals will occur in other habitats as well.

Blue Oak Woodland and Digger Pine-Oak Woodland. The blue oak woodland and pine-oak woodland present within the Overall Site has an understory dominated by annual grasses. Because of the presence of grassland habitat, many of the wildlife species found in the grassland will occur in the oak woodland. Additional wildlife species observed or expected in the oak woodland include reptiles such as western skink; granivorous and frugivorous birds such as acorn woodpecker, scrub jay, phainopepla, lark sparrow, and dark-eyed junco; insectivorous birds such as Nuttall's woodpecker, ash-throated flycatcher, tree swallow, plain titmouse, white-breasted nuthatch, western bluebird, blue-gray gnatcatcher, yellow-rumped warbler, and northern oriole; omnivorous birds such as yellow-billed magpie; and predators such as great horned owl, western screech owl, and loggerhead shrike.

Additional mammals either observed or expected include various species of bats, deer mouse, and bobcat. It is likely that mountain lions are present in the Overall Site.

Northern Mixed and Chamise Chaparral, and Diablan Sage Scrub. The three scrub communities present in the Overall Site are used by similar wildlife species. The northern mixed chaparral and the black sage dominated Diablan sage scrub form dense thickets, which are used by fewer wildlife species. Some of the wildlife species present in the grassland and oak woodland will occur in the scrub communities. Wildlife species either observed or expected which are adapted to these scrub communities include birds such as California quail, greater roadrunner, Anna's hummingbird, wrentit, Bewick's wren, California thrasher, orange-crowned warbler, lazuli bunting, rufous-sided towhee, California (brown) towhee, white-crowned sparrow, and fox sparrow; and mammals, including brush mouse, pinyon mouse and dusky-footed woodrat.

Riparian Areas. Wildlife species either observed or expected in the streams, stock ponds, and springs in the Overall Site include many of those observed in other plant communities in the site. Additional wildlife species include: amphibians such as Pacific slender salamander, western toad, Pacific tree frog, and red-legged frog; reptiles such as southwestern pond turtle and common garter snake; birds such as mallard, greater yellowlegs and common snipe, black phoebe, western woodpewee, Wilson's warbler, and black-headed grosbeak; and mammals such as raccoon and gray fox.

Rock Outcrops. Rock outcrops provide shelter and nesting sites for a number of wildlife species. Many of the wildlife species found in adjacent habitats within the Overall Site will use rock outcrops. Reptiles found in the outcrops include those found in the habitats discussed above. Birds observed or expected which nest in cliff forming outcrops include Golden eagle, prairie falcon, barn owl, white-throated swift, Say's phoebe, cliff swallow, and rock wren. Mammals found in the outcrops include those found in habitats discussed above, including dusky-footed woodrat and deer mouse which will build nests in outcrops, and bats which roost in caves and crevices.

Game Animals. Big game animals present in the project site include Columbian black-tailed deer (*Odocoileus hemionus columbianus*), and introduced species including tule elk (*Cervus elaphus nannodes*) and feral pig (*Sus scrofa*). In addition to the big game species present, a number of small game species are present or potentially present in the Overall Site. Small game species observed include California quail, mourning dove, common snipe, black-tailed hare, and desert cottontail. Small game species potentially present in the area include wild turkey, band-tailed pigeon, and western gray squirrel. Waterfowl potentially present include mallard.

Phase 1 Area

Wildlife species observed and expected in the Phase 1 Area are similar to those in the Overall Site. Habitat types absent from the Phase 1 Area include

northern mixed chaparral, and chamise chaparral. Hence, wildlife expected in these habitats are likely to be absent from the Phase 1 Area.

Grassland and Scrub. Associated with the non-native grassland in the Phase 1 Area are small, open stands of Diablan sage scrub. These scrub stands are dominated by a uniform cover of California sagebrush. Because most of the sage scrub stands are very small and far apart, they are considered equivalent in terms of wildlife habitat. Grassland forms a large component of scrub habitat, except in the dense stands of black sage scrub along Oak Flat Road. Wildlife expected in the black sage would be similar to those species found in the chaparral and scrub habitats in the Overall Site.

Bird species observed in the grassland include turkey vulture, red-tailed hawk, golden eagle, American kestrel, killdeer, long-billed curlew, mourning dove, barn owl, great horned owl, common poorwill, Say's phoebe, horned lark, American crow, common raven, mountain bluebird, loggerhead shrike, savannah sparrow, western meadowlark, and house finch.

Mammals species observed in the grassland include desert cottontail, black-tailed hare, California ground squirrel, coyote, and American badger. We observed very few small rodent holes and did not observe any mice during the evening spot-light surveys. Several skulls of an unidentified species of kangaroo rat were found outside of the Phase 1 Area.

Blue Oak Woodland. Blue oaks provide valuable perches, escape cover, and nest sites for birds, particularly for cavity nesting birds. They also produce acorns, an important food source for a variety of animals.

A number of the wildlife species observed in the grassland/scrub were observed in the oak woodland, including birds such as red-tailed hawk, American kestrel, Lewis' woodpecker, acorn woodpecker, Nuttall's woodpecker, northern (red-shafted) flicker, scrub jay, yellow-billed magpie, American crow, common raven, plain titmouse, white-breasted nuthatch, ruby-crowned kinglet, western bluebird, American robin, loggerhead shrike, northern mockingbird, phainopepla, European starling, yellow-rumped warbler, and house finch.

Mammals observed in the oak woodland include bobcat. It is likely mountain lions are present in the Phase 1 Area.

Riparian Areas. Wildlife species expected in Salado Creek and the stock ponds present within the Phase 1 Area include those species observed or expected in the Overall Site. Amphibians observed include Pacific tree frog and western toad. Reptiles expected include southwestern pond turtle, and sharp-tailed snake. Birds observed include great egret, Cooper's hawk, killdeer, common snipe, and hermit thrush. Mammals observed include California ground squirrel, coyote, and signs of raccoon.

In addition to the wildlife species discussed, Salado Creek supports a small warm water fishery. Several bluegill were observed in the portion of Salado Creek in Oak Flat Valley during the site visit.

Rock Outcrops. Few cliff forming rock outcrops are present in the Phase 1 Area. One outcrop in the proposed Indian Rock Park area adjacent to the Phase 1 Area south of Oak Flat Valley provides habitat for nesting raptors. This nest site was occupied by a pair of prairie falcons in 1990. Other wildlife species which are present in rock outcrops are similar to those discussed in the Overall Site.

Game Animals. Big game and small game wildlife species present or potentially present in the Phase 1 Area are similar to those species discussed above for the Overall Site.

Species of Special Concern

The plant and wildlife species of special concern present or potentially present can potentially occur throughout the entire project site. Hence, all portions of the project site are incorporated in the following discussion of the species of special concern.

Plants

Plant species of special concern potentially present in the project site and their federal and state status are listed in Table IV.D-A. Formal surveys for these plant species of special concern were not conducted. A discussion of the biology of the 15 plant species of special concern potentially occurring in the site follows.

Forked Fiddleneck. The forked fiddleneck grows on talus slopes derived from shale. This species is found in foothill and valley grassland along the west side of the San Joaquin Valley and adjacent Coast Range from Fresno County south to eastern San Luis Obispo County (Munz, 1968). The species is not known from the Mt. Hamilton Range (Sharsmith, 1945). The species blooms from March through May. Although potential habitat may be present in the project site for this species, it is unlikely to be present because it has not been recorded north of Fresno County.

Sharsmith's Harebell. Sharsmith's harebell is known from only three occurrences in Alameda, Santa Clara, and Stanislaus counties (CNPS, 1988). The species occurs in chaparral on barren soils associated with serpentine. The species is not likely to be present in the Phase 1 Area because of the absence of serpentine. The presence of serpentine in the western most portion of the Overall Site, in the area of Gooseberry Canyon and the upper

Table IV.D-A: Plant Species of Special Concern

Common Name	Scientific Name	Status (State/Fed/CNPS)
Forked Fiddleneck	*Amsinckia furcata*	-/F2/1B
Sharsmith's Harebell	*Campanula sharsmithiae*	-/F2/1B
Mt. Hamilton Thistle	*Cirsium campylon*	-/F2/1B
Soft Bird's Beak	*Cordylanthus mollis* ssp. *hispidus*	CR/F1/1B
Palmate-bracted Bird's Beak	*Cordylanthus palmatus*	CE/FE/1B
Mt. Hamilton Coreopsis	*Coreopsis hamiltoni*	-/F2/1B
Interior California Larkspur	*Delphinium californicum* ssp. *interius*	-/F2/3
Recurved Larkspur	*Delphinium recurvatum*	-/-/1B
Diamond-petaled California Poppy	*Eschscholzia rhombipetala*	-/F2/1B
Stinkbells	*Fritillaria agrestis*	-/F2/4
Talus Fritillary	*Fritillaria falcata*	-/F2/1B
Great Valley Gumplant	*Grindelia camporum* var. *parviflora*	-/-/4
Red-flowered Bird's-foot Trefoil	*Lotus rubriflorus*	-/-/1B
Mt. Diablo Phacelia	*Phacelia phacelioides*	-/F2/1B
Glabrous Allocarya	*Plagiobothrys glaber*	-/F2/3

Status: CE = California endangered; CR = California rare; FE = Federally endangered; F1 = Federal category 1 candidate for listing (enough data are on file to support federal listing); F2 = Federal category 2 candidate for listing (threat and/or distribution data are insufficient to support federal listing); 1B = CNPS List 1B plants, which are rare, threatened or endangered in California and elsewhere; 3 = CNPS List 3 plants, which are plants about which more information is needed (a review list); and, 4 = CNPS List 4 plant, which are plants with limited distribution (a watch list).

reach of the north fork of Orestimba Creek, suggests that Sharsmith's harebell may potentially be present in this portion of the site.

Mount Hamilton Thistle. The Mount Hamilton thistle occurs in the Mount Hamilton Range, in moist sandy places along streams and seeps in foothill woodland and chaparral, which are associated with serpentine soils. The species blooms from May through July. The species is unlikely to be present in the Phase 1 Area because of the absence of serpentine. However, the species may be present in the serpentine lense in the western portion of the Overall Site.

Bird's Beak. Soft bird's beak and palmate-bracted bird's beak occur in areas that have a high concentration of alkali such that the soil is barren due to the high salt or base content. These species are found in association with other species that are salt tolerant such as pickleweed (*Salicornia* sp.) and iodine bush (*Allenrolfea occidentalis*), salt grass, and alkali heath (*Frankenia grandifolia*).

Suitable habitat for two species of bird's beak appears to be absent because of the absence of alkali scalded areas, pickleweed and iodine bush. The alkali areas on the project site are relatively small and are associated with drainages and springs. Alkali soils do not occur in high concentrations and alkali adapted species such as salt grass are not abundant. Hence, neither of the bird's beak species are likely to be present on the project site.

Mt. Hamilton Coreopsis. This species is known only from the exposed dry rocky slopes of the western summits of the interior of the Mount Hamilton Range (Sharsmith, 1945). The species is known from near the summit of Mt. Oso, north of the Phase 1 Area in the Solyo USGS 7 1/2 minute quadrangle. and from the south facing slopes of Arroyo Bayo, west of the Overall area, in the Mt. Stakes USGS 7 1/2 minute quadrangle (CNDDB, 1989). The species blooms from March through May.

The close proximity of a known location to the project site and the presence of thin rocky soils on the project site indicate the possibility for the presence of Mount Hamilton coreopsis in the project site.

Interior California Larkspur. This species occurs in wet places in the foothill woodlands of the inner Coast Range, from Contra Costa County south to Santa Clara County (Munz, 1968). The Interior California larkspur is infrequently found in dry ravines and appears to be limited in distribution in the interior and east side of the Mt. Hamilton Range (Sharsmith, 1945). The species blooms from April through June. Because of the potential presence of suitable habitat, the species may be present in the project site.

Recurved Larkspur. The species occurs in the Central Valley between Colusa and Kern Counties, east of Tulare County, and west to San Luis Obispo County (CNPS, 1988) in areas of subalkaline soils in brush and open areas, alkali sinks and valley grasslands (Munz, 1968). The species blooms from March through May. This species may occur in the grassland or alkaline soils associated with the drainages within the project site.

Diamond-petaled California Poppy. This species is known from only seven occurrences (CNPS, 1988), and occurs infrequently in the interior and east side of the Mt. Hamilton Range (Sharsmith, 1945). The diamond-petaled poppy occurs in grassy areas and talus slopes, and blooms from March through June. The species has been observed on a hill north of the mouth of Del Puerto Canyon (CNDDB, 1989). Because of the presence of potentially suitable habitat and the close proximity of a known population of this species, the diamond-petaled poppy could occur in the project site.

Stink Bells. This species of fritillary has been observed in the Mt. Hamilton Range (Sharsmith, 1945). Stink bells occur in low heavy soils in valley grasslands, interior valleys, and foothill woodlands, from Mendocino to San Luis Obispo County and the Central Valley. The species blooms from March through April. Because of the potential presence of suitable habitat, particularly in the stream valleys with heavier soils, stink bells could occur in the project site.

Talus Fritillary. This species occurs in dry talus derived from serpentine outcrops, associated with chaparral and foothill woodland communities (CNPS, 1988, Munz, 1968). The species is known to be present to the west of the project site in the Mt. Boardman USGS 7 1/2 minute quadrangle (CNDDB, 1989). The talus fritillary blooms from March through May. The species is potentially present in the serpentine soils present in the Overall Site.

Great Valley Gumplant. The Great Valley gumplant occurs in the bottom lands of the San Joaquin River, from Sacramento to Kern County (Munz, 1968) and the valley and foothill grasslands (CNPS, 1988). The species blooms from July through October. The lower valleys of Salado, Crow, and Orestimba Creeks and in the vicinity of the proposed primary access road may provide potential habitat for the gumplant.

Red-flowered Bird's-foot Trefoil. This species is known to be present in Stanislaus County and from only one location in Del Puerto Canyon, in the Copper Mountain USGS 7 1/2 minute quadrangle (CNDDB, 1989, CNPS, 1988). Virtually nothing is known about this species. The one population occurs on road banks dominated by annual grasses near digger pines (CNDDB, 1989). The potential for this species being present on the project site is uncertain because: 1) little is known about this species; 2) the proximity of the one population of this species in Del Puerto Canyon to the Phase 1 Area, and 3)

the presence of small stands of digger pine in the grassland habitat in the Overall Site and Phase 1 Area which may provide habitat for this species.

Mt. Diablo Phacelia. This species has been recorded from Alameda, Contra Costa, Santa Clara, and Stanislaus counties (CNPS, 1988). It occurs only on Mt. Diablo and areas within the Mt. Hamilton Range above 2,000 feet (Sharsmith, 1945). The species occurs in rocky places in chaparral and foothill woodland communities in the inner Coast Range. Mt. Diablo Phacelia blooms from April through May. Potentially suitable habitat is present in the Overall Site in rocky areas above 2,000 feet. It is unlikely to be present in the rocky areas in the Phase 1 Area.

Glabrous Allocarya. Glabrous allocarya is adapted to grow in vernal pool environments and mesic (moist) alkali flats and is known to grow in marshy areas (CNPS, 1988, Munz, 1968). The species is known from Alameda, Marin, Santa Clara, San Benito, and Merced counties (CNPS, 1988). The species blooms from April through May (Munz, 1968). This species is not likely to occur on the project site because vernal pools and alkali flats are absent from the project site.

Wildlife

The San Joaquin Valley, including Stanislaus County, supports a number of wildlife species of special concern. Agriculture in the Central Valley has eliminated most of the native grassland, emergent freshwater marsh, and vernal pool habitat originally occurring in the valley. Species dependent on these habitats for survival have experienced population declines as a result of this habitat loss, leading to protection by the California Department of Fish and Game (DFG) and the U.S. Fish and Wildlife Service (USFWS). Table IV.D-B discusses the 17 wildlife species of special concern which occur or potentially occur in or near the project site.

Wildlife species of special concern observed in the Overall Site and the Phase 1 Area include Cooper's hawk, prairie falcon, long-billed curlew, and American badger. The following discussion presents information on the biology of the species of special concern which are present or potentially present throughout the project site.

San Joaquin Kit Fox. The San Joaquin kit fox is listed as endangered by the USFWS and threatened by the DFG. Kit fox primarily inhabit valley and foothill areas supporting alkali sink and grassland vegetation associations; foothill woodland associations provide marginal habitat (O'Farrell, 1983). Kit fox construct dens in loose-textured soils on well-drained sites. In the area of the project site, kit fox use the enlarged burrows of California ground squirrels and American badgers. San Joaquin kit fox do not den in saturated soils, areas where high water tables exist, or in areas subject to periodic flooding (McCue et al., 1981; O'Farrell, 1983). Kit fox are usually found where

Table IV.D-B: Wildlife Species of Special Concern

Common Name	Scientific Name	Status (State/Fed)
San Joaquin Kit Fox	*Vulpes macrotis mutica*	CT/FE
California Mastiff Bat	*Eumopes perotis californicus*	CSC/F2
American Badger	*Taxidea taxus*	CSC/-
San Joaquin Pocket Mouse	*Perognathus inornatus inornatus*	-/F2
Cooper's Hawk	*Accipiter cooperii*	CSC/-
Ferruginous Hawk	*Buteo regalis*	CSC/F2
Golden Eagle	*Aquila chrysaetos*	CSC/*
Prairie Falcon	*Falco mexicanus*	CSC/-
Long-billed Curlew	*Numenius americanus*	-/F2**
Burrowing Owl	*Athene cunicularia*	CSC/-
Yellow-breasted Chat	*Icteria virens*	CSC/-
Tricolored Blackbird	*Aeglaius tricolor*	CSC/F2**
Southwestern Pond Turtle	*Clemmys marmorata pallida*	CSC/F2
California Horned Lizard	*Phrynosoma coronatum frontale*	CSC/-
Blunt-nosed Leopard Lizard	*Gambelia silus*	CE/FE
California Tiger Salamander	*Ambystoma tigrinum californiense*	CSC/F2
California Red-legged Frog	*Rana aurora draytonii*	CSC/F2

Status: FE = Federally endangered; F2 = Federal candidate -2 for listing as threatened or endangered; CE = California endangered; CT = California threatened; CSC = California Department of Fish and Game Species of Special Concern; * = Federal Bald Eagle Protection Act; ** = Breeding habitat threatened.

slopes are less than 40 degrees. Natal dens are located on low relief of about 6 degrees (O'Farrell, 1983).

Recent surveys of the Lakeborough project site south of the intersection of Oak Flat Road and Highway 5 resulted in the observation of one kit fox approximately 2 miles south of Oak Flat Road (WESCO, 1990). Because of the presence of kit fox south of Oak Flat Road and the presence of similar suitable habitat on the project site, and because the proposed primary access road and eastern portion of the Oak Flat Road Alignment is within the mapped range of the San Joaquin kit fox, it is likely likely that kit fox occur in these areas. Kit fox may also be present in the area of the proposed Crow Creek and Orestimba Creek access roads. Surveys for kit fox in the project site were conducted in the Phase 1 Area in July and August of 1990 (LSA 1991), and in the proposed primary access road corridor in June and July 1992. DFG methodologies for kit fox sureys were used including the establishment of scent stations, spotlighting surveys and ground transects. Additional methods used in the 1992 surveys included remote photography stations. These kit fox surveys are included as Appendix D of this report.

Ground transect surveys of the Phase I Area and the Oak Flat Road Alignment resulted in the location of 19 potential kit fox dens in Oak Flat Valley and four potential kit fox dens in the eastern portion of Oak Flat Road, with two near the Entry Area and two in the vicinity of the orchard. Surveys of the proposed primary access road resulted in the location of 30 potential kit fox dens. Potential dens are defined as any natural den or burrow that has entrances of appropriate dimensions to accommodate San Joaquin kit foxes for which there is little to no evidence of kit fox use.

In the Phase I Area and Oak Flat Road Alignment, kit fox were not detected at scent stations or during spotlighting surveys. In the proposed primary access road, kit fox were not detected at scent stations or remote photography stations. Spotlighting surveys resulted in the observation of one small fox, identified as a potential San Joaquin kit fox. It was determined that the fox was not a red fox, a fox which also occurs in grassland habitats in the vicinity of the project site.

California Mastiff Bat. The California mastiff bat occurs from central California, southward to central Mexico. In California they have been recorded from Butte County southward in the western lowlands (Williams, 1986). The California mastiff bat was formerly widespread in the San Joaquin Valley. This species roosts in colonies and appears to favor rugged, rocky areas where suitable crevices are available for day-roosts. These day-roosts are located in large cracks in exfoliated slabs of granite or sandstone which open downward, on cliff faces greater than 10 feet in height (Williams, 1986). The bats feed on insects captured in flight and may forage for considerable distances from their roosting sites. Bats roosting in suitable habitat in the

inner Coast Range may forage over the San Joaquin Valley floor where insects are more abundant (Williams 1986). No bats were observed during the site visits. However, the cliff forming rock outcrops present in the project site provide potential habitat for the California mastiff bat.

The primary threat to the California mastiff bat is the disturbance of colony roosting sites.

San Joaquin Pocket Mouse. The San Joaquin pocket mouse has a distribution which is limited to the Sacramento, San Joaquin, and Salinas valleys of California. Several subspecies of San Joaquin pocket mouse occur in the San Joaquin Valley. Recent research suggests that the subspecies of San Joaquin pocket mouse found in the area of the project site may be the McKittrick pocket mouse (*Perognathus inornatus neglectus*) and not the San Joaquin pocket mouse (*P. i. inornatus*) (Williams, pers. comm.). *P.i. inornatus* may be restricted to the eastern side of the San Joaquin Valley and *P.i. neglectus* may be restricted to the western side of the San Joaquin Valley (Williams, 1986). The San Joaquin pocket mouse (*P.i. inornatus*) inhabits dry, open grassy, or weedy ground of fine-textured, usually sandy soils (Grinnell, 1933). They may be found in grasslands and saltbush areas as well as in blue oak woodland (Williams, pers. comm.). The McKittrick pocket mouse inhabits a variety of soils in the sloping western margin of the San Joaquin Valley and the adjacent rugged hills (Williams, 1986). Populations of pocket mice tend to fluctuate extensively (Patton, pers. comm.). Because of taxinomic problems, the status of this species complex is uncertain. However, both subspecies are uncommon (Williams, 1986). Pocket mice were not observed during the site visits. Pocket mice (ssp.) have been observed in similar habitats in the vicinity of Corral Hollow Road 20 miles north of the Phase 1 Area (Schmoldt, pers. obs.) and habitat for the pocket mouse is present in the project site.

The primary threat to the San Joaquin pocket mouse is habitat destruction by urbanization and conversion of native grasslands to orchards or grain fields.

American Badger. The American badger occurs in a diversity of habitats. The primary requirements for the badger seems to be sufficient food, friable soils for digging their dens, and relatively open, uncultivated ground in grassland and savanna habitats (Williams, 1986). Badgers prey on burrowing rodents such as gopher and California ground squirrel. Several American badgers were observed in the Overall Site and Phase 1 Area, in the lower Crow Creek drainage near the eastern boundary of the Overall Site and in Oak Flat Valley. Because of the abundance of California ground squirrels thoughout the entire project site and the likely presence of California ground squirrels in the vicinity of the proposed primary access road, the American badger is likely to be found throughout the entire project site.

The primary threat to the American badger is loss of habitat to agriculture and development and from rodent and predator poisoning.

Cooper's Hawk. The Cooper's hawk occurs in open woodland and riparian woodland. The hawk feeds primarily on medium sized birds and small mammals. The Cooper's hawk nests in pine and hardwood woodlands, including oak woodlands (Terres, 1980). One Cooper's hawk was observed in the Phase 1 Area along Oak Flat Road area during the July and August visits. It is likely that this Cooper's hawk may have been a resident bird. Potential nesting habitat is present for this species along Salado, Crow and Orestimba Creeks.

The primary threat to the Cooper's hawk is the loss of riparian and other woodland habitats that are used for breeding.

Ferruginous Hawk. The ferruginous hawk is found only in the arid plains and open country of western North America. The species is not known to breed in California (Mallette et al, 1976). However, the species winters in California, in relatively flat, uncultivated arid plains and open rangeland along the western edge of the Central Valley, in open valleys in the inner Coast Range, and in the deserts of southern California. The ferruginous hawk feeds primarily on small to medium sized rodents. The ferruginous hawk has been observed along Highway 5 in the vicinity of the proposed primary access road (Schmoldt, pers. obs.).

The primary threat to the ferruginous hawk in California is the loss of large areas of uncultivated open grassland used by wintering birds for foraging. This habitat loss is a result of development, reservoir construction, and agriculture.

Golden Eagle. The golden eagle is a large, wide ranging predator of open grassland and savanna habitats in hilly country. Golden eagles nest on cliff faces, in large trees, and electrical transmission line towers. Nests are large structures that are used for many years, by the same pair and often subsequently by other eagles (Palmer, 1988). The breeding territories of golden eagles can range from 20 to 60 square miles (Mallette et al, 1976). The species feeds primarily on medium sized mammals. No large nest structures were observed during the site visits. However, a number of golden eagles were observed during the site visits, including a family group of five birds, including two adult eagles and three young birds of the year, suggesting the possibility of eagles nesting in the vicinity of the project site. In the area of the proposed primary access road, a number of electrical transmission towers are present which provide potential nesting sites for golden eagles.

The primary threat to the golden eagle is the loss of habitat that is used for nesting and foraging, the poisoning of rodents, and disturbance of nest sites by humans.

Prairie Falcon. The prairie falcon occurs in the western half of the United States and is resident throughout most of its range. Prairie falcon numbers in the California deserts are apparently normal, but populations around the perimeter of the Central Valley are reduced (Remsen, 1978). The prairie falcon nests on cliff faces and forages for prey over open country. The species prey primarily on small birds and mammals. A prairie falcon nest was located in the rock outcrop at the south end of Oak Flat Valley. One young falcon was observed at this nest site. Cliff forming rock outcrops and flat open areas are not common in the project site. Hence, this nest site and the adjacent Oak Flat Valley are important habitat of this pair of prairie falcons. One other cliff forming outcrop was observed in the southern portion of the Overall Site which showed evidence of the presence of a raptor nest.

The primary threat to the prairie falcon includes loss of habitat, agricultural pesticides, and disturbance of nest sites by humans.

Long-billed Curlew. Long-billed curlew occurs in California in two seasonal roles, as a summer resident in northeastern California and as a winter visitor on the seacoast and in interior lowlands west of the Sierra Nevada divide (Grinnell and Miller, 1944). The species winter in California along the coast and in the Central Valley and adjacent foothills. They often feed on insects in the dry, open rangelands and cultivated lands. Several were observed in Oak Flat Valley during the February site visit.

The primary threat to the long-billed curlew is the loss of breeding habitat to development and agriculture.

Burrowing Owl. Burrowing owls occur in open grassland and arid areas, and are associated with burrowing mammals such as the California ground squirrel. The burrowing owl nests in rodent burrows and feeds on insects and small mammals. No burrowing owls were observed during the site visits. However, burrowing owls could be present in the project site because of the presence of suitable habitat and an abundance of California ground squirrel dens.

The primary threat to the burrowing owl is the loss of habitat that is used for breeding, and the disturbance of nesting areas by humans.

Yellow-breasted Chat. The yellow-breasted chat is a warbler that breeds in riparian woodland habitats throughout California (Remsen, 1978). The species feeds on insects and is a summer resident found only in riparian woodlands. The yellow-breasted chat was not observed during the site visits. The species may be present in portions of Crow and Orestimba Creeks. The species has been observed in San Antonio Valley to the west of the project site (Schmoldt, pers. obs.).

The primary threat to the yellow-breasted chat is the loss of riparian woodland and possibly nest parasitism by brown-headed cowbirds (*Molothrus ater*).

Tricolored Blackbird. The tricolored blackbird occurs only in California and nests in colonies in freshwater marshes that are dominated by cattail and bulrush. They forage in grassland areas and fallow fields throughout the year. Tricolored blackbirds were not observed during the site visits. Suitable breeding habitat is not present in the project site. A colony of 1,200 to 1,500 tricolored blackbirds has nested near the Patterson exit on Highway 5, approximately two miles west of Patterson (CNDDB, 1989). Tricolored blackbirds nesting in the vicinity of the project site and the proposed primary access road may use the site for foraging.

The primary threat to the tricolored blackbird is the loss of marshland breeding habitat and the disturbance of nesting areas by humans.

Southwestern Pond Turtle. The southwestern pond turtle is a subspecies of the western pond turtle (*Clemmys marmorata*). The southwestern pond turtle is known from San Francisco, south to northwestern Baja California, in the coastal hills and valleys west of the Central Valley (Stebbins, 1985). The pond turtle is an aquatic species, found in ponds, marshes, rivers, streams, and irrigation ditches that typically have rocky or muddy bottoms and are vegetated with cattails and other aquatic vegetation. They are found in ponds and drainages year-round in woodlands, grasslands, and open forests. Eggs are laid from April through August (Stebbins, 1985). Pond turtles were not observed during the site visits. Suitable habitat for pond turtles is present in the project site in the form of stock ponds and permanent ponded areas in the major streams.

The primary threat to the southwestern pond turtle is the loss of riparian and wetland habitat to development, and the collection of turtles.

California Horned Lizard. The California horned lizard is a subspecies of the coast horned lizard (*Phrynosoma coronatum*). The species frequents a variety of habitats including grassland, scrubland, coniferous forests, and broadleaf woodland. It is found in areas of fine loose soil where it forages for ants and

other insects. It is active year-round and eggs are laid from April through June (Stebbins 1985). The species was not observed during the site visits. The species has been observed north of the project site near Corral Hollow Road and Highway 580 in grassland habitat similar to that found in the project site (Schmoldt, pers. obs.).

The primary threat to the California horned lizard is loss of habitat to development and agriculture. The conversion of the sparse native bunchgrass grassland to dense non-native grassland may also have contributed to the decline of the California horned lizard (John Brode, pers. comm.).

Blunt-nosed Leopard Lizard. The blunt-nosed leopard lizard occurs in the San Joaquin Valley, the Carrizo Plain of eastern San Luis Obispo County, and the Cuyama Valley of extreme eastern Santa Barbara County (Montanucci, 1965). The northern limits of the species range are uncertain. A reliable record exists for Corral Hollow, southwest of Tracy, San Joaquin County (Vitt, pers. comm.). This species occurs in sparsely vegetated alkali and desert scrub habitats, low foothills and washes to an elevation of 3,000 feet (Zeiner et al 1988). The species will use small mammal burrows for shelter, or construct their own burrows. They hibernate underground during the winter, and emerge in late March or April, depending on temperature. They feed mainly on insects, with grasshoppers as an important item in the diet. Small lizards are occasionally eaten by the blunt-nosed leopard lizard (Montanucci, 1965, 1967). The species was not observed during the site visits. Because the site is at the extreme northern limit of their range, the potential for the occurrence of this species on the project site is uncertain.

The primary threat to the blunt-nosed leopard lizard is the conversion of habitat to cropland.

California Tiger Salamander. California tiger salamander occurs in central California from the Sacramento Valley south to Santa Barbara (Stebbins, 1985). It is found in the San Joaquin Valley and surrounding foothills, both in the Coast Range and the Sierra Nevada. California tiger salamanders live in grassland and oak woodland habitats (Stebbins, 1985). The adults emerge from their summer dormancy period after the first fall rains to mate and lay their eggs in ponds, reservoirs and slow-moving streams. After hatching, the larvae remain in the water while developing into adults. During the hot spring and summer months, when ponds and streams dry up, the adult salamanders disperse to rodent burrows and other underground retreats to survive the summer heat. The stock ponds found throughout the entire site provide potentially suitable breeding habitat for the species and the grassland and oak woodland areas which support large California ground squirrel colonies provide potentially suitable upland habitat for the tiger salamander. California

tiger salamanders were not observed during site visits to the Phase 1 area and to the remainder of the project site.

The primary threat to the tiger salamander is loss of habitat and the presence of introduced bullfrogs and warm water fish which prey on salamander larvae.

California Red-legged Frog. The California red-legged frog frequent marshes, slow parts of streams, lakes, reservoirs, ponds, and other, usually permanent water (Stebbins, 1985). They are attracted to places where cattails and other plants provide good cover. Their breeding period is short, lasting usually only one or two weeks in January through March. No red-legged frogs were observed on the project site. However, one unidentified frog was observed at Salt Grass Spring which may have been a red-legged frog. Suitable habitat is present in the project site for red-legged frogs.

The primary threats to the California red-legged frog are the loss of habitat and the presence of bullfrogs and warm water fish which prey on the frog larvae.

Potential Impacts

Potential impacts to vegetation and wildlife present or potentially present in the project site are discussed separately for: 1) the Overall Site; 2) the Phase 1 Area; and, 3) the proposed primary access road.

Overall Site

Vegetation and Wildlife

Cumulative Loss. The proposed development of villages 2, 3, 4, and 5 and the estates planned for Conservation Areas could result in the cumulative loss of up to 50 percent of the existing habitat in the project site. This is a significant impact.

Oak Woodland. The development would result in the loss of significant blue oak woodland.

Riparian Habitats. Construction of the access roadways along Crow and Orestimba Creeks would result in the significant loss of riparian woodland along these major drainages at road crossings and potentially at other locations if road construction took place close to the creek channel. Riparian and wetland vegetation associated with stock ponds and springs could be lost

to development. Stream road crossings which are culverted would impede wildlife using the drainage channels for daily and seasonal movements.

Wildlife Corridors. The Open Space Plan for the project incorporates corridors of undeveloped open space which connect the Conservation Areas. These corridors are proposed to average 1/4 mile in width. A minimum width for these corridors is not proposed. The corridors are in locations which will allow terrestrial wildlife to move between the Conservation Areas and the average width is adequate to allow this movement.

The estates planned for the Conservation Areas, which are proposed to range in size from three to 40 acres, would significantly affect wildlife use of these areas, particularly the larger predatory species which do not tolerate regular disturbance. The construction of fences would further reduce habitat value for wildlife and present barriers to wildlife accessing creeks, stock ponds and springs for water and shelter.

Grazing. Livestock grazing would likely continue in the Conservation Areas. More concentrated grazing would likely occur in fenced pastures of estates located in the Conservation Areas. This could result in heavy grazing which would reduce habitat value for wildlife.

Public Access. Public access into areas of high wildlife use, such as rock outcrops, stock ponds and springs, and riparian woodland areas along streams would reduce habitat value for wildlife.

Road Hazards. The access roadways planned for development along Orestimba and Crow Creeks will result in an increase in the number of wildlife road-kills, especially near the creeks, where wildlife would have to cross the roads to obtain water. Potential San Joaquin kit fox road kills are a significant impact associated with the lower portions of the primary access roads proposed along Crow and Orestimba Creeks.

Exotic Plants and Animals. The proposed project could result in the introduction of exotic plant species used in private and commercial landscaping. Non-native plant species which are adapted to the natural conditions occurring in the project site could disperse and compete with native plant species.

The introduction of dogs and cats would result in the predation and harassment of wildlife species.

Pollutants. Fertilizers, herbicides, and pesticides associated with the maintenance of the golf courses, residential and commercial landscaping, and oil, grease, and other pollutants resulting from runoff from streets and driveways could enter drainages, stock ponds, and springs present in the site. These pollutants could have an adverse affect on amphibians present and reduce the quality of the water used by other wildlife species.

Species of Special Concern

Plants. The serpentine outcrop present near the western boundary of the project site in the Wilcox Ridge Conservation Area may support populations of plant species of special concern. Planned trail access in this area could result in threats to these populations.

Wildlife.

- San Joaquin Kit Fox. Construction of access roadways along Crow and Orestimba Creeks near Highway 5 could result in loss of kit fox habitat and may directly impact kit fox potentially present in the area by the removal of dens and road kills of individual animals. These roads could present a barrier to the movement of kit fox between populations present to the north and south of the project site.

- Prey Species. Development in areas of the project site dominated by grassland would result in loss of habitat for California ground squirrels and other species which are important prey species for predators such as golden eagle, prairie falcon and American badger, and for nesting of burrowing owls.

- Riparian Areas. Access roadway, residential, and commercial develepment could result in the loss of habitat for southwestern pond turtle, California tiger salamander, and California red-legged frog.

- Ferruginous Hawk. The loss of grassland habitat along the western edge of the San Joaquin Valley, due to access road construction, would result in loss of ferruginous hawk winter habitat.

- Cliff Forming Rock Outcrops. Human activity on or near these cliff forming rock outcrops would likely result in the abandonment of these areas by cliff nesting species such as prairie falcon and golden eagle.

Phase 1 Area

Vegetation and Wildlife

Cumulative Loss. The flat and gently sloping terrain of the Oak Flat Valley will be most heavily developed. Hence, the cumulative loss of habitat for plants and wildlife species will be greatest here.

Oak Woodlands. The development would result in the loss of blue oak woodland.

Riparian Habitats. Construction of the section of the Oak Flat Parkway along Salado Creek would result in loss of existing riparian vegetation at the road crossings. Stream road crossings which are culverted could impede the movement of wildlife using the stream channels for daily and seasonal movements. Stock ponds present in the Phase 1 Area may be filled or encompassed by development. This would result in loss of breeding habitat for amphibians.

Wildlife Corridors. The proposed development plans will reduce wildlife access across Oak Flat Valley and reduce wildlife access to the portion of Salado Creek in Oak Flat Valley.

Grazing. Livestock grazing would likely continue in the Salado Conservation Area. This could result in continued heavy grazing which would reduce habitat value for wildlife.

Road Hazards. The potential for increases in wildlife road kills discussed in potential impacts for the Overall Site would occur along the Oak Flat Parkway.

Exotic Plants and Animals. The potential introduction of non-native plants, and dogs and cats, would result in impacts similar to those discussed for the Overall Site.

Pollutants. Potential impacts resulting from the introduction of fertilizers, insecticides, pesticides, and grease and oil associated with runoff from residential and commerical development would be similar to those discussed for the Overall Site.

Species of Special Concern

Plants. Project plans could potentially result in impacts to several plant species of special concern.

Wildlife.

- San Joaquin Kit Fox. Construction of the Oak Flat Parkway, the primary access road, and I-5 Freeway improvements would result in the loss of kit fox habitat and may impact kit fox potentially present by the removal of dens and road-kills of individual animals. These roads could present a barrier to the movement of kit fox between populations present to the north and south of the project site.

- Prey Species. The development of the Oak Flat Valley, which is the only large, relatively flat open space in the Phase 1 Area, would result in the reduction of prey populations such as California ground squirrels which are important for predators such as American badger, bobcat, golden eagle and prairie falcon.

- Riparian Areas. Project related impacts could result in the loss of stock ponds and portions of drainages which provide habitat for three amphibian and reptile species of special concern potentially present in the project site, the California tiger salamander, California red-legged frog, and southwestern pond turtle.

- Ferruginous Hawk. The loss of low relief grassland habitat in the vicinity of Interstate 5 resulting from the construction of access roads would result in the loss of winter habitat important to the ferruginous hawk.

- Cliff-Forming Rock Outcrops. The proposed passive Indian Rocks Park and golf course planned for the southern portion of Oak Flat Valley would have a direct impact on the active prairie falcon nest present in the Indian Rock outcrop south of Oak Flat Valley. Human related activities in the vicinity of the nest site during the breeding season would likely result in the abandonment of the nest (Walton pers. comm.).

Mitigation Measures

Measures to mitigate potential impacts are discussed separately for: 1) the Overall Site; 2) the Phase 1 Area; and, 3) the proposed primary access road.

Overall Site

Vegetation and Wildlife

1. Map the location of oaks present in areas planned for grading. In portions of the project site where grading is planned, confine grading to grassland areas where trees are not present. Where removal of oaks and other native trees is unavoidable, prepare a management plan for the oak woodland habitat and replace trees lost on a 5:1 ratio. Management plans should be approved by the County prior to final map approval for each village.

2. Establish riparian woodland, including willow, cottonwood, valley oak, and western sycamore (*Platanus racemosa*), and other riparian vegetation along the streams. Prepare a management plan for these riparian areas. The management plan shall include plans for long term monitoring and maintenance. Management plans should be approved by the County prior to final map approval for each village.

3. It is recommended that road crossings be made by construction of bridges or oversized culverts which require no additional creek fill over major streams (Orestimba, Salado, and Crow creeks) and oversized box culverts (four by six feet minimum) for tributary streams to provide continuous corridors for wildlife along the stream channels. The appropriate crosing structure shall be determined in consultation with CDFG, USFWS, U.S. Army Corps of Engineers, and the County Public Works Department.

4. Ponds should be left intact for use by wildlife. Ponds planned for removal shall be replaced by ponds of equal size located in the Conservation Areas in protected locations to provide adequate access to water.

5. Springs should be incorporated into project open space. Where springs are lost to development, water from the community water distribution system shall be piped to protected areas to establish sources of water similar to those lost for wildlife.

6. The Conservation Areas will be linked with open space areas such as golf courses and the landscaped areas between areas of development to provide uninterrupted wildlife access corridors in the valley where practical. Corridors connecting Conservation Areas will average 1/4 mile in width and will be no narrower than 220 yards in width.

7. Restrictions on the number of livestock shall be implemented to prevent overgrazing in open space areas and corridors, and the Conservation Areas. This will require preparation of a grazing

management plan to guide grazing of the Ranch when development begins.

8. Trails shall be carefully planned to avoid areas of high wildlife use, such as rock outcrops, stock ponds and springs, and riparian woodland areas along streams.

9. Wildlife "underpasses" should be incorporated into the design of the planned roadways to allow wildlife to cross under rather than over the roads to reduce the number of wildlife road kills. These undercrossings should be a minimum of four feet by six feet in size and installed wherever roadways cross tributary streams. The appropriate crosing structure shall be determined in consultation with CDFG, USFWS, U.S. Army Corps of Engineers, and the County Public Works Department.

   In areas of mapped kit fox range, provide road undercrossings six feet wide by four feet high approximately every 1/4 mile. Existing fencing should be replaced along the roadways, using hog-wire fencing with mesh size approximately six by eight inches and topped with three strands of barbed wire. This would allow kit fox to pass through the fence and prevent coyotes and other large predators of kit fox from passing through the fence. The fencing should be placed along the right-of-way boundary. These fences would serve to confine cattle present in the area.

   Set maximum enforced vehicle speed limits at 35 to 45 miles per hour on the primary access roads and 25 miles per hour on the connector roads to reduce road-kills.

10. Prepare a landscape management plan for the Overall Site which guides public and private site landscaping. The plan shall include a list of invasive species which cannot be used in project landscaping and a list of native species suitable for use in project landscaping. The plan shall emphasize the use of drought tolerant plant materials to reduce water consumption. Management plans should be approved by the County prior to final map approval for each village.

11. Regulations shall be specified in the Codes, Covenants, and Restrictions (CC&Rs) to maintain strict enforcement of leash laws for dogs and require cats to remain indoors at all times. The project shall designate project-generated tax revenues to fund a part-time position with the County Animal Control to patrol the area and trap feral dogs and cats to minimize their numbers in the project site.

12. Prohibit further introduction of non-native warm water fishes and bullfrogs. Populations of native amphibians present or potentially

present in the project site could be greatly reduced by predation by warm water fishes and bullfrogs.

13. Golf course maintenance and commercial and residential landscaping shall involve a miminum use of fertilizers, herbicides and pesticides. A site-specific golf course management plan and individual commercial and residential landscape plans shall be prepared. These programs shall include a detailed analysis of potential changes to ground and surface water quality from source and non-point source pollution; compliance with regulatory requirements on the storage of fuel and hazardous materials; an assessment of risk associated with accidental spills; and provide appropriate mitigation measures and management practices to minimize these potential impacts. Management plans should be approved by the County prior to final map approval for each village.

A list of fertilizers and pesticides proposed for use in the management plans shall be submitted to the County Department of Agriculture for review and comment. The description shall include the types of compounds to be used, the amounts to be applied, and form of application. The use of pesticides, herbicides, fungicides, or insecticides which are included on official state or federal lists of restricted materials will require issuance of a Restrictive Materials Permit. These permits are issued by the County Agricultural Commissioner. All materials on this list will be subject to special use restrictions as a condition of permit issuance to help ensure against significant health risks. Non-selective herbicides that affect all plants in the contact area will be limited to spot spraying as needed to kill only the target vegetation and to reduce the use of chemicals.

The storm drain system from residential and commercial landscaping and streets shall be designed to filter potentially hazardous materials prior to discharge into natural watercourses. Outflows shall be directed in such a manner that the maintenance and monitoring will allow for the protection of surface water quality. Any stormwater runoff directed to natural creek channels shall be contained in detention areas and subjected to removal of nutrients and contaminants by vegetative or other means.

The effectiveness of these management plans shall be checked through periodic monitoring of nutrients and suspended solids in nearby surface and underground water sources. Sampling shall begin prior to construction to provide background water quality data and shall continue during construction and after construction, for a period of time to be decided by the regulatory bodies to assure that the project is in compliance with Regional Water Quality Control Board water quality standards.

14. No more than 0.5 acres (excluding driveways) shall be developed with structures or impervious surfaces on any estate lot. Driveway widths should not exceed 12 feet (except turnouts).

15. The undeveloped portions of any estate lot shall be fenced from the developed portion or dog runs established in the developed part of the lot in such a manner as to prevent dogs from accessing the undeveloped area.

16. Landscaping shall not exceed one acre on any estate lot.

17. No houses shall be constructed within one-quarter mile of the edge of any wildlife corridors.

18. Estate lots shall be in clusters of three or more and use a common driveway.

19. Roadways accessing any estate lot shall not exceed 1,000 linear feet per lot served (from their connection with in-village roadways).

20. Estate lot access roads shall not cross any designated wildlife corridors.

21. Estate lots may be subdivided only upon a finding of the County Planning Commission that, based on a CEQA review, such subdivision could constitute an environmentally superior alternative to not permitting the subdivision. This may require a cumulative impact analysis involving all 100 potential estate lots. In no case shall the total number of estate lots exceed 100 lots after subdivision.

22. No estate lots shall be located over one-quarter mile from the boundaries of a village.

23. Estate lots shall be developed only on areas overlooking proposed village developments and within watershed of previously developed areas. Estate lots shall not be located within 1,000 feet of the crest of any major ridge.

24. Prior to development of each estate lot, a biotic resource survey shall be conducted of the lot to determine if there are significant biological resources present. If such resources are found, any development shall be designed to avoid affecting the resource to the satisfaction of the County Planning Department.

25. Estate lot grading and fences shall not be located within 300 feet of any "blue-line" stream as designated in the applicable USGS topographic maps.

26. If there are over 20 oak trees on a lot, tree removal shall be limited to five percent of oak trees on any lot. If there are fewer than 20 oak trees on a lot, one tree may be removed per lot.

Species of Special Concern

Plants.

27. Conduct surveys to determine the potential presence of plant species of special concern prior to consideration of development plans for each village. Suitable habitat for sensitive species found in the region include serpentine outcrops and the areas around springs and rock outcrops.

    If plant species of special concern are present, management plans shall be prepared for each species which insure the long-term viability of the habitat for the species found.

Wildlife.

28. Conduct surveys for the potential presence of kit fox, using DFG-approved survey methodologies in the lowland areas between Interstate 5 and the foothills of the Orestimba and Crow Creek access road corridors prior to the consideration of development plans for Villages 4 and 5.

29. Limit fill of creeks to necessary road crossings. Prepare a management plan to establish additional riparian woodland habitat, as discussed above, to improve habitat for wildlife species. Regulations will be established in the CC&Rs to prohibit the introduction of non-native warm warm water fishes and bullfrogs to the streams and stock ponds. These species prey on the eggs and larvae of native frogs and salamanders. Surveys for the presence of California tiger salamanders, California red-legged frogs, and southwestern pond turtle will need to be conducted for the potential presence of these species in the Village 2-5 areas.

30. Retain California ground squirrel colonies where possible in open space areas and the Conservation Areas to provide a prey base for raptors and other predators and potential nesting sites for burrowing owls. Poisoning of ground squirrels and other rodents shall be prohibited in Conservation Areas to prevent secondary poisoning of predators such as golden eagle, prairie falcon, bobcat, and American Badger. If rodent control must be conducted in other areas, use zinc

phosphide or other poisons approved by the USFWS which are of low risk to non-target species.

31. Cliff-forming rock outcrops shall be included in project open space areas. Keep trail systems away from these outcrops. Trail distances shall be established through consultation with raptor specialists with DFG and USFWS. Rock outcrops or cliffs which contain active raptor nests shall be off-limits to human use during the nesting season (March through August). Survey all cliffs and rock outcrops for raptor use prior to approval of development plans.

Phase 1 Area

Vegetation and Wildlife

Mitigation measures for many of the potential impacts to vegetation and wildlife in the Overall Site are applicable to the Phase 1 Area. Where impacts are similar, reference is made to the previous mitigation measure.

32. Development within the Oak Flat Valley shall be clustered to maintain some of the level portion of the valley for wildlife, particularly the southern portion of the site in the vicinity of the Indian Rock prairie falcon nest where development should be set back 1/4 mile from the prairie falcon eyrie.

33. Prepare and implement a management plan for the oak woodland present in the Phase 1 Area similar to the Overall Site.

34. Prepare and implement a management plan for the establishment and maintenance of riparian woodland along Salado Creek.

35. Road crossings should be made by the construction of bridges or oversized culverts which require no additional creek fill for their placement over Salado Creek pursuant to agency recommendations (see Overall Site Mitigation #3).

36. Mitigation for stock ponds and springs in the Phase 1 Area are similar to those discussed above for the Overall Site.

37. Prohibit further introductions of non-native warm water fishes and bullfrogs which prey on native amphibians.

38. Locate corridors within Oak Flat Valley to allow access to and through the valley by wildlife. Corridors shall be a minimum of 100 yards wide. The proposed golf courses could serve as corridors for wildlife. To provide an adequate connection between the golf courses and the

Conservation Areas, the open space areas in three locations could be expanded, including: 1) the areas north and south of the proposed golf club; 2) the area south of the proposed public services area and vineyard in the central portion of the valley; and, the area along Oak Flat Road, south of the proposed polo center.

39. Wildlife underpasses shall be constructed at regular intervals along the Oak Flat Parkway to reduce the number of road-kills, as discussed for the Overall Site above.

40. Implement mitigation to control exotic plants and animals as discussed for the Overall Site.

41. Implement mitigation measures to control pollutants as discussed for the Overall Site.

Species of Special Concern

Plants.

42. Plant species of special concern potentially present in the Phase 1 Area were not observed during surveys of the Phase 1 area. Follow-up surveys for the plant species of special concern shall be conducted prior to issuance of construction permits.

Wildlife.

43. In areas of kit fox habitat along Oak Flat Parkway corridor and the primary access road, construct "underpasses" to allow kit fox to cross under rather than over the road to reduce the number of road-kills. The underpasses shall be a box culvert four feet by six feet in size spaced approximately every 1/4 mile. Culverts installed for other uses such as stream crossings are suitable for this purpose. Include roadside fencing in this area which will allow kit fox to pass through but will prevent predators such as coyotes from passing through.

44. Conduct endangered species consultation with the USFWS and DFG as the Oak Flat Parkway and Primary Access Road would result in the removal of suitable kit fox habitat, and potentially form a barrier for the north-south movement of kit fox. The project should be required to comply with USFWS requirements for loss of kit fox habitat.

45. Mitigation for the loss of prey species important to predators is similar to the discussion for the Overall Site.

46. Prepare a management plan as discussed for the Overall Site. The three species of special concern potentially present in the streams and stock ponds present in the Phase 1 Area, including the California tiger salamander, California red-legged frog, and southwestern pond turtle, were not observed during surveys of the Phase 1 Area. Follow-up surveys for these species shall be conducted prior to issuance of construction permit. If these species are subsequently found, necessary mitigation measures will be taken to reduce the impacts to these species.

47. The rock outcrop present in the proposed Indian Rock park adjacent to the Phase 1 Area contains an active prairie falcon nest. Mitigation for this nest site would include: 1) the inclusion of the proposed Indian Rock Park area south of Oak Flat Road in the wildlife corridor between Village 1 and Villages 3 and 4; 2) prohibit the development of trails within this wildlife corridor; 3) prohibit public access to the corridor within one-quarter mile of the nest during the nesting season (March through August); 4) redesign the development plans to remove the proposed single family units east and south of Oak Flat Road in the southeastern portion of Oak Flat Valley, in the vicinity of the proposed access road between Village 1 and Village 3; and, 5) require a speed of 25 MPH maximum for the road between Village 1 and Village 3 located west of the nest site and provide for emergency parking only.