

**A Survey of Historical Source Materials  
Pertaining to the Project Area and Access Road of  
the Diablo Grande Ranch Development Project  
Located near Patterson, Stanislaus County, California**

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## Introduction

The second phase of historical research was designed to recover data for both the Diablo Grande Project Area and the area adjacent to the proposed access road (from the Del Puerto Canyon Road interchange on I-5). For the purposes of description, the larger project area has been divided into three smaller areas (Map 1). Because the territory under study is large, the search was extensive in nature and focused on property records and patterns of land tenure. Given this focus, the logical time frame for this report is the period from 1875-1920, and principally, from 1875 and 1900 during which time, almost all of the land in the larger Diablo Grande Project area came under private ownership.

The following report is organized in four sections: the first provides an overview of land transfer in the larger Diablo Grande Project Area; the second traces the accumulation of land into large parcels in each of the three smaller areas; the third reviews information about population during the period studied; and the fourth discusses land use.

This report is predicated on an earlier report on the Phase I Survey Area (Julien, 1991). The sections in the earlier report labelled Background Information, Early Travel, and Land Use apply not only to the Phase I Survey Area, but to the larger Project Area, so information found in these sections will not be repeated here. Another section on Land Use has been included in the present report because some additional information makes a return to this topic worthwhile.

One disappointing outcome of the present search was finding that no roads, except the Oak Flat Road discussed in the previous report, were developed in the study area. A map made in 1876 in connection with the development of the Oak Flat Road showed the locations of a number of structures, and hence, provided vital information about archaeological sites. A smaller amount of concrete information about site locations was turned up in the present search, found primarily in deeds, probates and federal survey records.

Because little concrete information turned up in the search, the strategy of identifying settlement and activity patterns using land transfer records was employed. This type of approach complements archaeological survey and provides a context for the sites identified.

## Land Transfer

California was admitted to the union as a federal land state, and consequently, title to all lands originated in the federal government (except in the case of grants made by Spanish and Mexican authorities prior to statehood). Some land was granted directly to the State of California, and then, regranted by the State to other parties. Patents were issued by both the state and federal governments in accordance with legislative acts which authorized the sale of government lands (Gates, 1976; Thorndale, 1984).

**Table 1. Patents Issued in Diablo Grande Project Area.**

<u>Type of Patent</u>	<u>Total Acres</u>	<u>% of Total</u>	<u>Number of Patents</u>	<u>Acres/Patent</u>
Railroad Grant	21683.0	40	2	10841.50
Preemption Claim	12163.0	22	88	138.22
Homestead Claim	8436.4	15	40	210.91
State Grant	8136.6	15	14	581.19
School Scrip	3519.6	6	23	153.03
Other	920.0	2	6	153.33
<b>Totals</b>	<b>54858.6</b>		<b>173</b>	

Note: Some of the patents may include lands that are not within the boundaries of the larger project area (Map 1). For example, the railroad grants are to very large tracts. The data shown includes only the lands within the project area.

Source: Stanislaus County, Patents (see Appendix I).

Five types of grants were common in the study area, as illustrated in Table 1 (using the data of Appendix I). Land granted to the Southern Pacific Railroad was the largest category (39% of the land in the area studied). Railroad land was largely located within the Diablo Grande

studied). Railroad land was largely located within the Diablo Grande Project area; very little land in the Access Road Area was granted to the Railroad (Maps 1 and 2).

When the acts of Congress authorizing the grants were passed, a large amount of land on the San Joaquin plains had already been transferred to private ownership and was being developed for agricultural production. Except for right-of-way grants through such areas, the Central Pacific (later the Southern Pacific) received mainly alternate sections in areas marginal to large-scale cultivation, as were, for example, the lands of the California Coast Range. For this reason, the total percentage of land granted in the study area (39%) is substantially larger than the percentage statewide (11.4%)(Robinson, 1948, pp. 150-151, 157).

The policy of granting alternate sections resulted in a checkerboard pattern of tenure which is indeed evident in the Diablo Grande Project Area (see Map 2). While the railroad held title to such lands, a pattern of leasing to other parties was common.

Other types of grants were for smaller parcels. Two, the preemption and homestead claim, were intended specifically to create small holdings. These two types of grants comprise 38% percent of the holdings in the study area. Awards were ideally to a quarter section (160 acres), but this parcel size functioned in practice as a maximum. The average parcel size for preemption and homestead claims in the study area was somewhat under the 160 acre ideal (Table 1). The government's intent--to distribute the land to small holders--was certainly met in the study area, if we exclude the railroad grants from consideration.

Preemption and homestead claims were found all over the study area and have special implications for archaeological survey. Both required that the claimant settle, improve and build a dwelling on the property. In the case of preemption claims, a certificate was filed, and after meeting the requirements for a specified period (usually 12 months) and paying the purchase price, the patent was issued. In the case of homestead claims, only a nominal fee was charged, but residence and land use requirements had to be met for a period of five years (Robinson, 1948, pp. 167-170). Given compliance with the terms of these grants, there should be remains of dwellings and other types of structures on these small parcels.

Some 21% of the land in the study area was granted by the State of California under various acts, or was claimed by filing school scrip issued by California or other federal land states. In the case of direct grants from the State, parcel size appears to have been close to a section (640 acres) in extent. The size of parcels claimed with scrip approximates a quarter section (160 acres). School scrip could be accumulated and used to claim very large tracts, as was the case in the San Joaquin Valley in the 1860s, but this practice does not seem to have occurred in the Diablo Grande Project Area. However, both school scrip and direct state grants were used to accumulate moderate parcels in the Access Road Area, where they developed fairly early (1868-81).

The lands lying at lower elevations were transferred first. The transfer of land is tied to government survey (Robinson, 1948, p. 189), and these lands were also surveyed first. Government survey in the project area commenced in 1859 at lower elevations in Township 6 South, Range 7 East, and Townships 7 South, Ranges 6 and 7 East. Additional surveys were carried out in 1866 and 1874. The survey of Township 6 South, Range 6 East, was carried out between 1870 and 1873<sup>1</sup>.

Map 2 shows the progressive transfer of lands to private hands. Despite evidence collected by the surveyor in 1859 that land in Township 6 South, Range 7 East, was already under cultivation (see R. B. Smith Ranch, Area 1), no land was actually transferred until 1868. A large percentage of the land in the Access Road Area was already in private hands at the time of the first railroad grant (4/20/75). The railroad grant occurred after all the upland area had been surveyed and very little had been granted, so the Central Pacific was able to annex all of the alternate sections lying above the land already granted. When a second grant was made (3/21/92), alternate sections at higher elevations were chosen. A preference for lower-lying land is evident (Stanislaus County, Deeds, 10-447, 9-258).

A preferential pattern is also shown in the transfer of land to other private holders in the period between railroad grants. Land in the northern

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<sup>1</sup>In my earlier report I stated that the federal survey of California was carried out between 1854-55 (Julien, 1991, pp. 1-2). My statement was based on my experience with land on the San Joaquin Valley plains, but is inaccurate in the case of the Coast Range lands. The dates given here correct my earlier report.

part of Township 7 South, Range 6 East, was transferred first. This land is the watershed area of upper Crow Creek. Assuming that grazing was the primary type of land use in the Diablo Grande project area (see section on Land Use), the availability of water and quality of pastures may have influenced claimant's choice. Land that was not claimed until after 1892 may have been less desirable in one or both regards, particularly in the case of land in the Access Road Area. However, whole sections may have been withheld from sale, and for this reason, transfer took place at a later date.

The topic of how and when the land was initially transferred bears on land use and will be taken up again in that section (see below). First, however, a description of the holdings that were developed in the study area is necessary.

## **Development of Large Holdings**

### Access Road Area (Map 3)

#### 1. Russell B. Smith Ranch

The earliest and best information about a ranching operation in the area affected by the Diablo Grande Project refers to the property owned by Russell Barzillai Smith. Smith built up a ranch of approximately 7000 acres in Township 6 South, Range 7 East (Map 3, Appendix II). The proposed access road crosses his property in Sections 3, 9 and 10.

Smith's property at the time of his death also included a portion of the former Mexican grant "El Pescadero" in Township 4 South, Range 7 East. He acquired this land by purchase from the confirmed claimants, beginning with a 2,039 acre purchase in 1868. He appears to have held as much as 11,687 acres of this land in 1874 (Stanislaus County, Deeds, 13-272), but at the time of his death, his total acreage in El Pescadero was only 5300 acres (Stanislaus County, Probates, #3 [McHenry Museum]).

His first transactions in the Access Road Area also date to this time. Between 1867 and 1871, he purchased 1,120 acres in parcels of 160 acres that had previously been patented to Augustus Bronson and Morris Rosenberg (see Appendix II). In 1869 he filed military bounty land

certificates on another 160 acres in this area. He used neither the preemption nor the homestead claim, but acquired the remainder of the ranch in the Access Road Area from the State of California or from other parties who had patented small parcels. His purchases from the State totalled almost 3,000 acres, and clearly, this type of purchase was a major method of accumulation in Smith's case.

While the paper record begins in 1868, we can document a major investment by Smith in the Access Road Area in 1859. John Terrell, the surveyor who conducted a partial survey of Township 6 South, Range 7 East, noted the location of Smith's principal dwelling and commented on his successful agricultural venture in the general remarks he recorded on the agricultural potential of the township:

This township is situated in the San Joaquin Valley near the hills, joining the Mount Diablo range of mountains. The surveyed portion contains several cañons of very rich soil. Mr. Smith established a very valuable farm in Section 14, in which he raises all kinds of fruits and vegetables (Federal Survey Notes, Township 6 South, Range 7 East).

Terrell locates the Smith house in precisely the same location as the site labelled "R. B. Smith's" on the 1876 map of the Oak Flat and Adobe Valley Road (Julien, 1991, Map 3).

Smith was also recorded in the 1860 and 1870 censuses. In 1860, Smith was 43. He was listed as a "stock raiser" with \$3,000 in real estate and \$8,950 in personal estate, probably mainly in livestock. His household included 4 unmarried men and no one else. With him were: John Waters, 46, originally from Ireland; John Walden, 23, from Massachusetts; Thomas Livingston, 30, from Missouri, and Jim, 13, a California Indian. Waters was listed, like Smith, as a stock raiser. The others were listed only as "laborers" (United States, Bureau of the Census, 1860 Population Schedule).

The household had a different character in 1870. Smith was 50 (?) and was listed as a farmer with \$19,000 in real estate and \$40,000 in personal estate. Some of the latter was probably livestock. With Smith were his wife, Maria L., age 30, and a daughter, Mariah M., age 2. A single man, James Geleres, age 27 and originally from Texas, was listed as part

of the household. His occupation was "laborer" (United States, Bureau of the Census, 1870 Population Schedule).

Smith died in 1876, and because his estate passed through probate, we know even more about the property at that time and during the 10 year period following when his wife, as executrix, submitted records to the court. In the probate assessment, Smith's property was described in five parcels (Table 2).

The sheep camp noted on the list was recorded as being located in Section 11 of Township 6 South, Range 7 East. The inventory for the probate of the Smith property was taken the same year as the map for the Oak Flat and Adobe Valley Road (1876). No sheep camp appears in Section

**Table 2. The Russell B Smith Ranch in 1876**

El Pescadero Rancho

8 miles of Fence	\$	3200
House, Barn and Corral		3000
Windmill and Tank		500
Stock Herder's House		100
The Grummet Garden		200
Reuter's House, Barn and Corral		1000

Sunflower Ranch

(Section 36, Township 5 South, Range 7 East)

Dwelling House, Garden, and Windmill	1200
Granary	1000
Barn, Sheds and Corral	400

Big Salado

(Section 14, Township 6 South, Range 7 East)

House, Garden and Barn	1000
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Sheep Camp

(Section 11, Township 6 South, Range 7 East)

House and Wool Shed	125
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Little Solada Ranch

(Sections 23 and 24, Township 6 South, Range 7 East)

House, Barn, Corral, Granary and Windmill	1250
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Source: Stanislaus County, Probates, #3 [McHenry Museum].

11, but the viewers may only have identified structures in the vicinity of the proposed road. Another sheep camp appears in Section 9. This camp is located on property that Russell B. Smith purchased in 1875. Perhaps there were two camps, or alternatively, the identification of the camp on the probate list as being located in Section 11 was in error.

The livestock inventoried for the probate consisted of 148 head of stock cattle, 46 calves, 46 hogs, 74 mules, 231 horses, 3 Jennets and 4 Jacks. These animals were held in partnership with William Preston. Smith also had a partnership interest with William McVey in 700 stock sheep (known as the Martin Lot) and 5900 stock sheep (Island Lot), half of which were lambs. All of the sheep recorded in the probate were jointly owned with McVey. Just where the livestock was pastured was not indicated.

The estate also included two promissory notes owed to Smith by Augustus Bronson, one of the two parties who had sold him lands in 1868-71 (totalling \$17382.89 and dated November 8, 1872).

While the promissory note indicates a business relationship of some kind with Bronson, the 1870 census suggests that Bronson may have actually been settled on Smith's ranch. The Bronson household was enumerated right after Smith's. It included: Augustus Bronson, age 35 from Sweden; Elizabeth Bronson, age 32 from Wisconsin; a son, Fernando, age 8 and born in California; and Jo Sway, age 26 and born in China. Bronson was listed as a "farm laborer" though he had \$1,000 in personal property, and Jo Sway was listed as "cook". Some of the names listed after Bronson are the names of patent holders in the Access Road Area located North of the junction between the access road and the old Oak Flat Road (Newhall, Hunt, McCaffrey)(United States, Bureau of the Census, 1870 Population Schedule). Bronson's residence is probably located in the intermediate area.

During the time the estate was administered by Smith's widow, Maria L Smith, barley, oats, wheat and hay were the crops harvested, presumably on the flat land parcels. Agricultural production was the estate's chief source of revenue, but sheep herding was also an important source of income (see Table 3).

**Table 3. Net Proceeds from the Russell B Smith Estate (1876)**

<u>Activity</u>	<u>Amount in Dollars</u>	<u>% of Total</u>
Grain Production	\$ 23,398.33	62
Hogs, Cattle and Horses (1/2 interest, with Preston)	7,189.21	19
Sheep (1/2 interest, with McVey)	7,169.25	19
<b>Total</b>	<b>37,756.79</b>	

Source: Stanislaus County, Probates, #3 [McHenry Museum].

The accounting covers the period from May, 1876, to March, 1877 (Appendix III). A number of people were paid for herding. No names were mentioned twice. The wages varied a great deal (from \$3.00-74.00), and in a number of cases, the amount suggests that the payment was for a fairly long period. Hispanic names are common. Besides herding, payments were made to individuals for marking (2 people in May, 2 in June), work with bucks (1 in May), and dipping (11 in June). James Chism, one of the early owners of the Oak Flat Ranch, was paid for sheep dipping in June. These services were probably performed at or near the "Sheep Camp". A small amount was expended in October for building a corral. The business also paid for the services of a bookkeeper (\$130 in July).

Bills from Frederick Moullen and Moses May were presented for stubble in July and August. Grazing on stubble was becoming common in this period as bottom land was put into grain production, thus eliminating the necessity for driving the sheep into the Sierra Nevada in the summer months. The other Smith ranches, where barley stubble would have been available, probably provided the bulk of the stubble required by the partnership. Grazing on property owned by others may indicate that the herd was larger than the Smith ranch could support during the critical summer months.

A bill from Oullabaut & Co (\$336.10), presented on August 5 for the services of G. Larios and others for "herding and other work and labor with sheep," may include the services of a shearing crew. A wool shed was located at the camp, so shearing may have taken place on the site. Also, dipping appears to have taken place on the property, and dipping normally occurred at the same time as shearing (Wentworth, 1948, p. 451).

Alternatively, sheep may have been driven to a shipping point for shearing. After the Tulare and San Pablo Extension Railroad was developed (1890; Radcliffe, 1940, p. 146), shearing pens were commonly located at stations to facilitate shipping until the 1920s when trucking made shearing feasible at the sheep camps themselves.

Less is known about the time before the railroad, but a shipping point on the San Joaquin River is plausible. For example, a small settlement known as Las Juntas near Mendota (on the Big Bend of the San Joaquin River) is known to have been a shearing site that did a large seasonal business (Milliken Notes; Latta, 1989, p. 79). The shearing crews were largely Mexican/Native American.

There were shearers recorded in the 1870 census of Stanislaus County. Two adjacent households of "sheep shearers" were recorded in San Joaquin Township, probably near Hill's Ferry. The households included 8 shearers: 4 from Ireland, 1 from Canada, 1 from Ohio (with his wife, who was born in Ireland), and 1 from Mexico (United States, Bureau of the Census, 1870 Population Schedule). No one was named Oullabaut or Larios.

The Smith estate account also recorded sundry bills for groceries (and specifically, rice, flour, onions and coffee), nails, matches, tinware, candles, soap and wood delivered to the "Sheep Camp". Presumably, meats and vegetables were supplied from the other Smith ranches.

The accounts total \$14,271.48 on the debit side of the ledger and \$7,169.25 on the credit side. Most of the entries are for 1-4 lambs or sheep (at \$.75-1.00 each), but a number of sizeable purchases (\$116.25-2,725.75) were also recorded. 144 animals were sold in lots of from 1-35 animals (29 transactions) and 7,063 animals were sold in lots of from 90-2,725 animals (10 transactions). The large transactions took place between mid September and early October.

The receipts for sheep sales might be larger than during a normal year because the business was probably being liquidated. Maria Smith sued William McVey in a San Joaquin County court because he had possession of the sheep at the time of Russell B. Smith's death and had not paid off his share of joint indebtedness or turned over proceeds of sales to her. This suit was concluded before her accounting, and the data in the

probate record indicate that the records of the business (probably those kept by the bookkeeper) were available to her.

Her next accounting indicates that she rented the sheep range to Patterson (probably J. D. Patterson) for two years at \$713.80 per year. Her resources from then on were concentrated on grain production.

## 2. John W. Jones Ranch

Another individual who built up a ranch in the Access Road Area is John W. Jones. Jones purchased 3,000 acres in Townships 5 and 6 South, Range 7 East, in the years 1881-1883 (Map 3; Appendix II). The proposed access road crosses his land in Section 34 of Township 5 South, Range 7 East.

We know more about Jones' life because of biographies of two of his sons done in early histories of the San Joaquin Valley (Tinkham, 1921, pp. 181-182; Guinn, 1905, pp. 253-254).

John W. Jones was born in North Carolina and lived seven years in Missouri before emigrating overland to California in 1852. After farming grain one crop year on the Stanislaus River, he settled permanently in San Joaquin County on French Camp Road (Guinn, 1905, pp. 253-254). He made a major purchase of land in 1869 when, for \$19,000, he purchased two ranches from George Kidd near what is now Escalon. The total acreage transferred to him at this time was 20,800 acres (Stanislaus County, Deeds, 5-17; Tinkham, 1921, p. 669). At one time, Jones had clear title to 37,000 acres of grain lands (Guinn, 1905, pp. 253-254).

Jones was also a stock raiser. Although he was reported to have made two trips East to buy cattle, his business also involved sheep:

He made a specialty of raising sheep, being thus actively engaged when wool was selling at high prices, and made a good deal of money in his operations (Guinn, 1905, pp. 253-254).

His son, Levi Jones, owned a 4,800 acre ranch nine miles East of Turlock, at Montpellier (Elliott & Moore, 1881, pp. 88, 182). This ranch

was used for grain production, as the lithograph in the 1881 history of Stanislaus County clearly illustrates (Elliott & Moore, 1881, p. 88). The biography of Levi Jones in the same text notes that he had 2,600 sheep (Elliott & Moore, 1881, pp. 181-182). No sheep are shown on his Turlock ranch, and perhaps he had some arrangement with his father who had just purchased a ranch in the Access Road Area (at age 66). Levi Jones lived on his ranch near Montpellier all of his life.

John W. Jones resided in Escalon until the time of his death in 1893 (Guinn, 1905, pp. 253-254). The inventory of his estate included tracts of land in San Joaquin, Stanislaus and Tulare Counties (Stanislaus County, Deeds, 52-278). The inventory of his property on the East side of Stanislaus County included approximately five sections in Township 4 South, Range 12 East, as well as a parcel in the Access Road Area known as the "West Side Ranch".

Judging by the equipment inventoried as part of his estate, Jones' land was largely used for cereal grain cultivation. The only property listed as part of the West Side Ranch was a stove and a harvester.

Jones purchased the West Side Ranch in two transactions, purchasing 2,400 acres from David Dutton in 1881 and another 420 acres from James Stevenson in 1883 (see Appendix II). Another 280 acres (in Section 26, Township 5 South, Range 7 East) was part of his estate at the time it was probated (Stanislaus County, Deeds, 52-278). The land was originally patented to small holders between 1872-75, and had already been transferred more than once.

### 3. Manuel Rogers

Manuel Rogers also accumulated a sizeable parcel in the Access Road Area (Map 3; Appendix II). He purchased a total of 2,880 acres around the fringes of R. B. Smith's parcel. The access road crosses his land in two places: in Section 3 and in Section 8 of Township 6 South, Range 7 East.

A very brief biography of Manuel Rogers appears in one of the local histories (Guinn, 1905, p. 1619). His name was Emanuel Rogers and he was born in the Azores Islands in 1859. He came with an uncle to Alameda County in 1874. In 1885 he leased a farm that he later purchased (Guinn,

1905, p. 1619), presumably the property in the Access Road Area he bought in 1892 (see below). He is listed in directories of Modesto in 1884-85 and 1893 (McKenney 1884-85, p. 480; 1893, p. 466). In 1905 he resided on an 80 acre ranch five miles South of Grayson, and it was said of him then:

He has the latest in agricultural implements, including a combined harvester (Guinn, 1905, p. 1619).

There is no probate record on file for him, so whether he was ranching or leasing his property in the Access Road Area cannot be determined.

Rogers' first purchase of land was in 1890 when he bought two parcels totalling 1,600 acres from Benjamin M. Hartshorne of New York, Benjamin F. Clayton of Multnomah County (Oregon), Henry A. Clayton of San Luis Obispo County, and Charles J. Clayton of Contra Costa County (Stanislaus County, Deeds, 47-91; see Appendix III). The two parcels were nearby, but one was located in Salado Creek drainage, and the other, in the Crow Creek drainage.

The parcel on Salado Creek, in the Access Road Area, was originally purchased by Hartshorne with California school scrip in 1868 and 1881 (Stanislaus County, Patents, 8-352, 8-354), but there is no evidence to suggest that Hartshorne was personally involved in ranching in Stanislaus County. Adjacent to the Hartshorne tract were two quarter section parcels patented by Thomas Clayton in 1872 and 1876 (Stanislaus County, Patents, 3-405, 9-552). Hartshorne and the other Claytons may have been investing in land near land held by a family member.

Rogers purchased several additional parcels in 1892, including one fairly large parcel that had been accumulated by DeWitt McKenney (Stanislaus County, Deeds, 51-217). Finally, he bought a group of miscellaneous parcels from the State of California in 1907 (Stanislaus County, Patents, 10-216). Rogers' only additional lands were town lots in Modesto purchased between 1882 and 1888 (Stanislaus County, Deeds, 23-513, 30-20, 36-146, 41-84) and land in Section 2 of Township 5 South, Range 7 East (49-425, 50-281).

While we really have no data about Rogers' use of the land in the Access Road Area, we can speculate that he was ranging sheep on it. Adjacent to his property in the Crow Creek drainage (just to the South)

was the ranch of Frank J. Gomes (1895 map). Gomes, a native of Flores in the Azores, began his economic life in 1875 in California as a sheepherder in the Hollister area. In 1876 he came to the West side of Stanislaus County where he worked and saved, and in 1880, formed a partnership with John Lesta in the sheep business. The business was a success, and after buying Lesta out, he began to buy property, accumulating his land on Crow Creek. Later, when he had a herd of 3,500 Merino sheep, he sold the business out, keeping a 2,000 acre parcel which he leased for stockraising (Tinkham, 1921, p. 318).

Rogers' operation may have been similar. If so, he was one of several Azorean Portuguese with interests in the study area, including Gomes, Lesta (presumably also from the Azores), and a man named Barbeira. Barbeira owned a parcel that was bought by Stephen Rogers (no apparent relation to Manuel Rogers) in 1879 and annexed to the Oak Flat Ranch. Rogers actually purchased the land Manuel Francisco Barbeira and Maria Thomazia (Stanislaus County, Deeds, 41-558), parents of Antoin Barbeira who was known as Antoni Francis in California. Barbeira's parents were residents of the village of Santa Cruz on the island of Flores in the Azores at the time they transferred the parcel to Rogers (Northeast quarter of Section 2, Township 7 South, Range 6 East).

#### Northern Project Area (Map 4)

The Phase I Survey Area is wholly contained within the area defined as Northern Project Area, and the reader is referred to my earlier report for information about the Oak Flat Road and the early development of the Oak Flat Ranch (Julien, 1991, pp. 4-5, 10-12). That report covers the period until 1890 when Frederick A. Hyde purchased the Oak Flat Ranch in two transactions from the widow of Stephen Rogers (Julien, 1991, pp. 11-12). Hyde and later owners added to this property, so that by 1935, the area we are calling the Northern Project Area was largely a single parcel.

#### 1. Frederick A Hyde Ranch

As noted in the earlier report, Frederick A Hyde purchased the Oak Flat Ranch in two transactions in 1890 from the widow of Stephen Rogers (Julien 1991, pp. 11-12).

We know something about Stephen Rogers because his biography appears in the 1881 history of Stanislaus County. He came to California from New York in 1853 and headed for the mines of Tuolumne County, but stayed only a month. After engaging in a fishing business in Stockton and ranching in Calaveras, he came to Stanislaus County in 1867 and began farming hops near Paradise, on the East side of the San Joaquin River. At the time the biography was written Rogers was said to own 5,000 head of sheep on the Big [Salado] Creek. He also owned a four-acre property in Oakland where he raised fruit. From 1879 on, Rogers lived in Modesto (Elliott & Moore, 1881, p. 127).

Rogers transferred the Oak Flat Ranch to his wife prior to his death, so that this parcel did not go through probate. The deed noted that the parcel "is generally known as the 'Oak Flat Ranch' on the Solada Creek" (Stanislaus County, Deeds, vol. 38, p. 619).

Hyde greatly expanded the original Oak Flat Ranch (Map 4; Appendix II). He acquired all of the property from other owners, and there are no patents in his name (except for the Southeast quarter of Section 34, Township 6 South, Range 6 East, see below). Some of his purchases were entire sections originally granted to the railroad. The Oak Flat Ranch was the largest single parcel in his name, but he held other parcels further South in the Orestimba Creek drainage.

Almost all of Hyde's land in Stanislaus County was in the West side hills. The first land he acquired was a quarter interest in a parcel on the valley bottom near Orestimba Creek (West half of Section 27, Township 7 South, Range 8 East; Stanislaus County, Deeds, vol. 13, p. 3). The remaining interest was owned by Thomas R. Muir of Contra Costa County (Stanislaus County, Deeds, vol. 13, p. 4). Hyde and Muir acquired this parcel in September of 1874.

Hyde purchased his first property in the project area in 1877 and transferred it almost immediately to another purchaser (Section 16, Township 7 South, Range 7 East; Stanislaus County, Deeds, vol. 19, pp. 524, 526).

He made his second purchase just prior to the acquisition of the Oak Flat Ranch; he bought the Southeast quarter of Section 34 in Township 6 South, Range 6 East, from the State of California. An earlier patent

application appears to have been made on this parcel, however, since the patent to Hyde notes that the property had been held by the State since 1880 because of a delinquent tax assessment of \$3.94 in 1879. The transaction is further complicated because the same quarter section was patented to Samuel Driver by the federal government on February 18, 1890. Hyde paid Driver \$500 on December 20, 1889 for this parcel, presumably to clear the title. Driver may have had a ranch in this area in the 1870s (see below)..

Hyde then acquired the Oak Flat Ranch, a parcel of 3,967.54 acres, on February 28, 1890 (Stanislaus County, Deeds, 44-481, 483), and began to accumulate adjacent lands. By 1901, when the property held in fee simple by Hyde and his wife was turned over to F. A. Hyde & Co, incorporated in the State of California, the Oak Flat parcel totalled 6,030.03 acres (Stanislaus County, Deeds, 68-369). In 1903, when F. A. Hyde & Co became Standard Investment Company, the parcel totalled 6,550.03 acres (Stanislaus County, Deeds, 82-425). The corporation continued to acquire land, so that by 1924, another 3,615.73 acres had been added (Stanislaus County, Deeds, 91-500, 296-102; Official Records, 75-457, 77-411, 97-362, 363, 364), and the acreage totalled 10,165.76 acres.

Hyde always maintained his interests in the Orestimba Creek area, and these lands were also transferred to the Standard Investment Company. This company acquired substantial acreage in addition to what Hyde had accumulated. For example, in 1911, it divested a number of large parcels (totaling 45,250 acres) in Stanislaus and Santa Clara Counties to the Orestimba Rancho Company (Stanislaus County, Deeds, 161-137, 163-99). The payment for this parcel was \$10, so stock or some other kind of interest appears to have secured the transaction.

Chain of title has not been fully traced, but several later transfers have been examined, and the finding can be made that the Oak Flat Ranch parcel remained intact and continued to increase in size. It was deeded to Sodie P. Arbios by the Federal Land Bank in 1935 (Stanislaus County, Official Records, 574-412). Arbios still had an interest in the property in 1972 when an option was offered on it. At that time, the property was under lease to Jean Cudiburu (Stanislaus County, Official Records, 2482-197).

The pattern of transactions does not lead to any detailed records about the property. No probates are available. The property was transferred by Stephen Rogers to his wife Caroline before his death, so that the Oak Flat Ranch did not go through probate. Frederick A. Hyde transferred the property to a corporation long in advance of his death, again avoiding any possibility of probate records.

We can hypothesize that the land continued to be used for sheep and cattle ranching. Sodie Arbios was the son of Pete Arbios, a Bernais French immigrant to the Bakersfield area who worked for Miller & Lux. His son Sodie also worked for the firm and became the ranch superintendent at the Buttonwillow Ranch in Kern County, the center of sheep ranching operations of the firm Miller & Lux (Paquette, 1982, p. 1; Wentworth, 1948, p. 196 ff.) The firm was the largest livestock operation in the Western United States, and in 1910, Miller & Lux fed 50,000 head of sheep. By the 1920s, it was feeding 75-80,000 head (Wentworth, 1948, p. 197).

Sodie Arbios retired from the firm in 1923. His purchase in 1935 may have been for the purposes of operating a sheep ranch. At some point, he retired from an active role, since the land was under lease to Jean Cudiburu (probably a French Basque) in 1972.

Because of chance mention in the government survey records or in the text of a deed, two structures can be documented in the Northern Project Area in addition to the structures in the Phase I Survey Area (see Julien, 1991). These structures are reported below. Comments on on land use can be found in the corresponding section.

Structure in Section 35, Township 6 South Range 6 East. At the time of the government survey of this township (which commenced February 7, 1873), a structure existed near the quarter section post on the line between Sections 34 and 35. The surveyor noted that Salado Creek was reached at 32.20 chains North of the common corner of Sections 34 and 35. The Creek, running East at that point, was 15 links wide, and from the opposite bank, a house bore South 82° East at a distance of 6 chains. The structure, therefore, was located in the Southwest quarter of Section 35. Section 35 was deeded to the Southern Pacific Railroad in 1875, and later to Stephen Rogers before being transferred with the Oak Flat Ranch to Frederick A Hyde (Stanislaus County, Deeds, 10-447, 31-308, 44-483).

Structure in Section 12, Township 6 South, Range 6 East. A cabin with a fireplace in it was distinctly noted on a parcel deeded by Coleman Brashears to Frederick A Hyde in 1903. The text of the deed specifies that Brashears retained the right to remove any and all buildings, fences and improvements within 60 days, "but it is distinctly understood and agreed that the house or cabin with the fireplace in it shall remain on said land" (Stanislaus County, Deeds, 81-120).

### Southern Project Area (Map 5)

#### 1. Timothy Paige

Paige began buying property in the project area in 1887, accumulating a large parcel by 1893 which he still held at the time of his death in 1902 (Map 5; Appendix II). This ranch was only a small part of Paige's holdings and was acquired late in a career in agriculture which began in 1865 and involved holdings in 8 California counties by 1889 (see below). While chain of title has not been fully traced after the time of Paige's ownership, it appears that the land passed to the Bank of California by 1906, then to the San Francisco & Fresno Land Company by 1918 (Carlton, 1906; Hannear, 1918). In the 1920s the land was held by Grace Covell and descendants of John D. Cox. Presumably, another process of accumulation occurred, so that by 1981, the Southern Project Area was largely a single parcel.

Timothy Paige is a large figure in San Joaquin Valley agriculture, and although he was never famous, his enterprises generated interest in the early histories of the area. Paige, his son and his son-in-law were also interviewed by Bancroft.

Paige arrived in California in the 1849 from Massachusetts and headed for the Tuolumne County mines. He did not take to mining, and returned to the town of Stockton to go into merchandizing. Although he was successful in business, he got out of it in 1864 and engaged in harvesting timber from the San Joaquin River banks. Soon after, he went into farming, purchasing a large tract near Modesto (Bancroft Interview, pp. 5, 11-13). By 1868, he held a half interest with William Chapman to a very large tract in Merced and Fresno Counties (Merced County, Deeds, B-

265). On his own, he continued to purchase land in the valley in Stanislaus, Merced, Fresno and Tulare Counties (Bancroft Interview, p. 23).

These early ventures were wheat farms. Paige, like other large landholders, used tenants to carry out cultivation. He provided land, housing, seed, and farming implements in exchange for half the crop. According to Paige and his son, the tenants worked hard because Paige would sell them the land if they raised the money to buy it (Bancroft Interview, pp. 9, 12, 34). Based on the index of deeds to valley bottom lands in Stanislaus and Merced Counties, at least, Paige's statement appears to be true.

Paige was interviewed by Bancroft on February 19, 1889, when Paige's interests had turned to other types of business, including stock ranching:

At a later date, I have been putting in a vineyard and an orchard, and stocking the land with cattle and horses...

I have more or less stock now, and I have an orchard that is just coming into bearing, in Tulare County.... (Bancroft Interview, p. 5)

I have engaged in stock recently; my horned stock is in Merced County mostly. I have thorough-breds there, and short-horn Durhams. I am raising beef cattle mostly; I may get into dairying later on.... (p. 9)

I suppose I first planted alfalfa about ten years ago and at a later date I have been planting trees and vines; I planted alfalfa to feed the stock of my tenants.... (p. 11)

...and then I bought a mountain ranch, and of course had to get cattle adapted to running on the mountains. I have been feeding stock this winter, for the market. It don't pay to sell stock cattle unless you can sell them fat--then it pays well.... (pp. 12-13)

Paige himself never mentions the sheep business, unless he includes sheep when he uses the term "cattle". His son, Cutler Paige, mentioned sheep once when he noted that John Mitchell, in Tulare, had charge of his father's sheep business at one time, but that now Mitchell was his own foreman (Bancroft Interview, p. 36).

The vineyard and orchard described by Paige was almost certainly the Page and Morton business in Tulare County. Paige began a raisin

business near Hanford in the Fall of 1889, in partnership with E. J. Root and L. S. Chittenden. The business was a showplace, and Paige had installed the most advanced equipment. The facilities included a boarding house for women, another for men, cottages for families and other buildings (38 in all). It was described in 1892 as "the largest and most complete raisin vineyard in the known world" (Memorial and Biographical History, 1892, p. 734).

Paige had certainly not abandoned farming. At the time of the Bancroft interview, he noted that he was farming in Placer, Yolo, Solano, Sonoma, Stanislaus, Merced, Fresno and Tulare Counties (p. 9).

All of Paige's acquisitions were by deed. Of the 20,016.8 acres he accumulated in the study area, almost 9,000 were purchased from the railroad (45%). His first purchases (in 1887) were to lands located at the head of Crow Creek in Sections 12 (Township 7 South, Range 6 East) and 7 (Township 7 South, Range 7 East)(Stanislaus County, Deeds, 38-413, 38-572). He continued his purchases in this watershed area, except for a couple of parcels in the Orestimba Creek drainage (Stanislaus County, Deeds, 42-17, 43-12, 48-132, 53-362) until the time of his death in 1893.

While we cannot be certain, the "mountain ranch" described in the Bancroft interview with Paige (cited above), may be the land in the Southern Project Area that Paige had acquired, although he was still in the process of acquisition at the time of the interview.

Paige and his son were in business together in real estate in 1890 at 116 Leidesdorff Street in San Francisco (Polk Directory, 1890, p. 837). He appears to have left Stockton for San Francisco about 1871, judging by the references to his place of residence in the deeds to which he was a party.

Although Paige died while still holding his ranch in the project area and his estate was probated, the records were lost in the San Francisco earthquake and fire of 1906.

2. John W Sharp

Sharp built up a ranch in the Orestimba Creek drainage (Map 5; Appendix II). He accumulated 2,760 acres North of Orestimba Creek by various methods, including homestead and preemption claims (23% and 4%, respectively), purchases from the State (25%), purchases from the Southern Pacific Railroad (29%) and purchases from private parties (19%).

Sharp lived to an old age, and as one of Stanislaus County's longtime residents when biographical histories were written, was the subject of two biographies (Guinn, 1905, pp. 353-354; Tinkham, 1921, pp. 740-741).

He was born in 1835 in Virginia, but came to the Hill's Ferry area in 1855 where he was employed in different cattle businesses, working first for a Mr. Wilson (probably Richard M. Wilson, see Elliott & Moore, 1881, pp. 175-176) and then for John McPike. In the 1870 census, he appears to have still been living at Hill's Ferry; he is listed as a "business agent" at that time, though he owned \$5,750 in real property and \$1,500 in personal property (United States, Bureau of the Census, 1870 Population Schedule). As he accumulated capital, he went into the sheep business on Orestimba Creek (Guinn, 1905, pp. 353-354; Tinkham, 1921, pp. 740-741). The date given in the biography is 1874, but the ranch in question may be the property Sharp purchased in 1881 in Section 26 of Township 7 South, Range 7 East. Sharp stayed in the sheep business only six years, selling out the sheep in 1880. From then until 1893, he ran cattle on his land. In that year, he sold out the cattle and leased the range (Guinn, 1905, pp. 353-354).

Sharp also bought agricultural property 11 miles South of Newman, the railroad town that was founded in 1890 and that absorbed the population of Hill's Ferry. On this ranch he farmed grain. In 1903 he bought another grain ranch (where he resided in 1905) closer to Newman (Guinn, 1905, pp. 353-354). About 1915, he moved into town (Tinkham, 1921, pp. 740-741). He may not have had a residence on the cattle ranch.

Sharp began his land purchases in 1881 when he bought the Northwest quarter of Section 26 (Township 7 South, Range 7 East)(see Appendix II). He added other parcels along Orestimba Creek very gradually, purchasing land on the lower reaches of Orestimba Creek first (approx. 400 feet of elevation; Stanislaus County, Deeds, 22-400, 31-494, 36-

216), and then, adding parcels at higher elevations (800 feet and up; Stanislaus County, Deeds, 9-46, 47-193, 8-396, 11-61; 49-471, and passim). Sharp made his last purchases in 1922.

## Population

No precise population figures can be obtained for the Study Area, but sources with information on population allow us to identify demographic trends. Two types of records have been used: censuses and school district reports. Censuses are taken by judicial township, and since townships were large, they provide only a general idea of population change. School district records are more useful. The districts themselves were smaller, and they were created or dissolved as population changed. Also, school censuses are more indicative of permanent, long-term settlement. Data from both types of records will be compiled and then analyzed.

### Judicial Township and Precinct Boundaries

Judicial townships, used as a basis for census counts, varied during the period between 1850 and 1925. The first townships were defined in 1854. Two were located on the West side of the San Joaquin River: Grayson and "Oris timbo". The boundary was defined by a line which ran due West to the county boundary from the mouth of Del Puerto Creek (Stanislaus County, Board of Supervisor's Minutes, vol. 2, p. 3).

The census of Orestimba Precinct included a total of 92 individuals. Of the households accounted, 13 heads of household were listed as stock raisers, one was a sheep herder, one was a ferryman, one was a blacksmith, and 3 were hotelkeepers (the latter 5 households were probably located in Hill's Ferry). Several laborers were listed, but no farmers (United States, Bureau of the Census, 1860 Population Schedules).

Few votes were cast from the Orestimba Precinct in the elections of 1862. The candidates for office who ran unopposed received only 14 votes, and this number appears to represent the maximum number of votes cast (Stanislaus County, Board of Supervisor's Minutes, vol. 1, p. 394).

In 1866, the two townships were merged into one, but the territory of the former judicial townships on the West side became election precincts. The northern boundary of the Orestimba Precinct was defined differently, however:

...commencing on the West bank of the San Joaquin river and running thence by the South side of Itenero's house and the North side of R. B. Smith's in a straight line to the summit of the Coast Range of mountains....place of voting to be at J B Mahoney's house. (Stanislaus County, Board of Supervisor's Minutes, vol. 2, p. 168)

If we can locate R. B. Smith's residence at the northern boundary of Section 14 (Township 6 South, Range 7 East) at that time, then the study area was largely within the Orestimba Precinct at this time.

In the election held on November 3, 1868, 32 votes were cast in Orestimba Precinct (Stanislaus County, Board of Supervisor's Minutes, vol. 3, p. 166).

The census of 1870 included 980 people in the San Joaquin Township, the only township on the West side (United States, Bureau of the Census, 1870 Population Schedules). Many individuals were listed as farmers and were probably engaged in dry farming grain on the plains at this time.

Precincts were redefined in 1871, when the Hill's Ferry Precinct was created out of part of southern Orestimba Precinct. The boundary between the new Hill's Ferry Precinct and the redefined Orestimba Precinct began on the section line between Sections 21 and 28 at its intersection with the San Joaquin River, then West to Orestimba Creek, then up Orestimba Creek to the County line (Stanislaus County, Board of Supervisor's Minutes, vol. 3, p. 64). The project area still fell entirely within the Orestimba Precinct at this time.

An election was held on September 3, 1871. The number of votes cast from the redefined Orestimba Precinct was 39 (Stanislaus County, Board of Supervisor's Minutes, vol. 3, p. 166).

Two judicial townships were again created on the West side of the San Joaquin River on September 8, 1875. The boundary between them was

the line between Townships 5 and 6 South. The project area fell entirely within the southern judicial township (Stanislaus County, Board of Supervisor's Minutes, vol. 3, p. 726).

The elections were reported by precinct. In the election of September 7, 1876, Orestimba Precinct cast 62 votes. In the election of November 2, 1880, Orestimba Precinct cast 70 votes (Elliott & Moore, 1881, p. 240).

The 1880 census was taken following precinct boundaries. Orestimba "Township" included 593 individuals. A total of 1,149 individuals were counted on the West side (137 for Grayson, 393 for San Joaquin, 593 for Orestimba, and 163 for Hill's Ferry)(United States, Bureau of the Census, 1880 Population Schedules). The 1890 census records were lost, so there is no census data again until 1900.

A precinct boundary change again occurred in 1898. This time Orestimba Precinct was bounded on the North by the line between Townships 5 and 6 South and in the South by the line between Townships 6 and 7 South. Thus, the study area was fairly evenly divided between two precincts.

In 1899, judicial townships were named instead of numbered. At this time, the name of the West side township was changed from Township 4 to Newman Township (Stanislaus County, Board of Supervisor's Minutes, 11-222). Only one judicial township was reported on this side of the county. The change took place sometime after 1880, but no reference could be found of it in the index of the Board of Supervisor's Minutes.

Newman Township had a total of 1,760 people in 1900, including 400 in the village of Newman and 1,360 elsewhere on the West side (United States, Bureau of the Census, 1900 Population Schedules).

### School District Boundaries

The first public school in Stanislaus County was located at Newsom's Bridge on Orestimba Creek in 1854 (Elliott & Moore, 1881, p. 228). School districts on the West side of the San Joaquin River were not formed until 1869, however. The first districts were Orestimba, Haight,

Bonita and White Crow (Map 6)(Stanislaus County, Board of Supervisor's Minutes, 2-242; Elliott & Moore, 1881, p. 227).

The first time we can be certain that part of the study area was included within the territory of a school district is in 1871, when a comprehensive definition of school district boundaries was given (Map 7)(Stanislaus County, Board of Supervisor's Minutes, 3-27). The Orestimba district included all the land South of a line between Townships 6 and 7 through the study area. The Northern Project Area may not have been included within a district at this time.

Changes in school district boundaries were fairly constant (Maps 8-11). At first, only the Orestimba District included the hill country to the county line. The other districts were on the plains. Only in 1884 was the Northern Project Area incorporated within a school district (Stanislaus County, Board of Supervisor's Minutes, 6-237).

The development of school districts is of interest to us, because a minimum of 15 students was technically necessary for the creation and continuance of a district (Section 1543, Subdivision 2, of the Political Code in 1895). The school age population in the watershed of Orestimba Creek (and possibly Crow Creek as well) was large enough to warrant a district at the time districts were first defined. Growth in the hill population warranted the creation of several districts between the years 1888 and 1893 (Cleveland in 1888, Randall in 1889, and Gresham, replacing Randall, in 1892; Annual Reports for 1888-89, 1889-90, 1892-93). These districts included little or no land on the plains (see Maps 9-11).

The hill districts which included the Northern Project Area were short-lived. In 1905, when the Gresham District lapsed, its territory was added to the Bonita District (Stanislaus County, Board of Supervisor's Minutes, 13-180). Some change in district lines occurred, but, after 1905, the hill country was always part of a district which included a substantial population on the plains. Therefore, the school statistics no longer give us any indication of population density in the hills.

The school district boundary in the Project Area as it appears in the Township Plat Maps (last entries 1918-21) is the township line between Townships 6 and 7 South. The Northern Project Area was then part of the

Patterson School District, and the Southern Project Area was part of the Bonita District.

Data on school-age population can be found in a series of reports turned in by Stanislaus County to the State Superintendent of Schools (Annual Reports, 1869-1901). Data from these reports has been compiled so that overall demographic trends on the West side can be analyzed (see below, Tables IV and V).

We can identify the location of several school buildings near the study area, but none within it. Bonita School, where children from the Northern Project Area probably went before 1892 and certainly went after 1904 (see below), was located in the Southwest quarter of Section 17, Township 6 South, Range 8 East, by 1870-71 (Annual Report, 1870-71). The property where this school stood was deeded to the Bonita School District in September of 1870 (Stanislaus County, Deeds, 8-579). In the years before 1892, students from the study area may also have gone to Haight School, located in Section 14 of Township 5 South, Range 7 East (Annual Report, 1870-71).

Children of families living in the Orestimba Creek drainage probably attended the Orestimba School, located in the Southwest quarter of Section 17 in Township 7 South, Range 8 East (Annual Report, 1871-72). This schoolhouse appears on the 1895 County Map (Douglass and Perley).

A school is shown on the 1895 county map on Salado Creek. It appears in the Southeast quarter of Section 22 (Township 6 South, Range 7 East) on land owned at that time by Laurent Seillan (Douglass and Perley, 1895). This school was probably the Randall School. It may have been moved to a location within the Northern Project Area when the boundaries of Gresham District were redrawn in 1895. During the period 1895 to 1905 (at which time the Gresham District was merged with Bonita, see above), a schoolhouse was probably located in the study area.

### Analysis

One trend, the growth in school-age population in the hill region, has already been identified using the creation and lapse of school districts as an indicator. Another trend can be seen from the school statistics: the

movement of population into towns beginning in 1890 when several railroad towns were founded. The overnight growth of Newman (1889-92; Table V), the slower growth of the town of Crow's Landing (Bonita School, 1897-99; Table V), and after 1911, the growth of Patterson all had an effect on settlement in the West side hills. The new railroad and town life were obvious pull factors.

Another pull factor was the development of school in the plains towns. A substantial amount of capital was invested in Newman and Bonita Schools during this period while almost nothing was invested in the other West side districts (Annual Reports, 1889-1901). The rising student population at these two schools warranted the additional expenditure, but the expenditure itself probably stimulated further migration of permanent residents from the hills, since educational facilities were far better in the new towns than in the hills.

Another, perhaps less obvious, trend is the growth of school-age population on the West side relative to the county as a whole during this same period. While some of the increase in school districts like Newman and Bonita may have been due to movement of people from the hills into town, not all of it was. The percentages indicate that some of the growth in the town districts was due to the arrival of new residents from elsewhere.

The same phenomenon occurred on the East side when the Central Pacific Railroad was developed in 1871-72, and the school statistics register both a relative and an absolute loss (reaching a low in the 1883-84 year) for the West side beginning in this period and continuing through the next two decades (Table IV). Our conclusion is that the demographic effect of the establishment of a railroad and the urbanization which followed occurred was the same on both sides of Stanislaus County, but that it occurred almost two decades later on the West side.

In conclusion, a growth trend in the hill region can be identified in the late 1880s, but it was largely reversed by the development of the railroad. This finding has some significance for archaeological reconnaissance in the study area. The permanent population of the Diablo Grande Project Area probably peaked in 1890. In the Northern Project Area, at least, it was never large; at a maximum, there were 25 school age children living in the area (1897, Table V).

**Table V. School Statistics by District.**

	Bonita	Orestimba	Haight	White	Crow	Grayson	Hills	Ferry	Last Chance	Cleveland	Newman	Randall	Gresham
1868-69	47	44	37	28									
1869-70	51	68	49	29									
1870-71	42	64	34	28									
1871-72	40	73	30	32		20							
1872-73	42	77	28	44		35							
1873-74	42	48	34	25		39	35						
1874-75	33	44	36	22		30	43		23				
1875-76	21	34	20	28		33	36		7				
1876-77	19	34	27	22		30	32		13				
1878-79	17	30	19	22		39	20						
1879-80	15	30	23	24		51	29						
1880-81	33	36	18	23		34	35						
1881-82	17	38	22	21		27	40						
1882-83	23	49	17	12		25	28						
1883-84	22	42		13		21	29						
1884-85	24	58		14		21	25						
1885-86	22	55	15	18		24	32						
1886-87	22	62	23	20		21	34						
1887-88	25	70	28	30		24	26						
1888-89	24	43	23	29		26				31			
1889-90	14	48	11	31		27				33	90	16	
1890-91	20	45	17	25		20				31	100	20	
1891-92	22	43	20	27		20				28	162	21	
1892-93	24	24	21	25		23				24	169	15	20
1893-94	36	31	29	21		21				22	169		23
1894-95	38	33	32	no data		29				19	170		24
1895-96	43	30	29	23		20				18	161		19
1896-97	44	26	27	32		20				25	185		20
1897-98	83	26	29			19				26	189		25
1898-99	90	24	29			12				27	192		22
1899-1900	94	19	31			21				35	197		20
1900-01	105	20	25			20				30	197		16

**Table IV. School District Statistics by Year.**

District	68/69		69/70		70/71		71/72		72/73		73/74		74/75	
	Total	% of												
Bonita	47	3.60%	51	3.23%	42	2.91%	40	2.65%	42	2.45%	42	2.29%	33	1.73%
Orestimba	44	3.37%	68	4.31%	64	4.44%	73	4.84%	77	4.50%	48	2.62%	44	2.30%
Haight	37	2.84%	49	3.10%	34	2.36%	30	1.99%	28	1.64%	34	1.85%	36	1.89%
White Crow	28	2.15%	29	1.84%	28	1.94%	32	2.12%	44	2.57%	25	1.36%	22	1.15%
Grayson							20	1.33%	35	2.04%	39	2.13%	30	1.57%
Hills Ferry											35	1.91%	43	2.25%
Last Chance													23	1.20%
Total West Side	156		197		168		195		226		223		231	
Total County	1305		1579		1443		1508		1712		1835		1909	

District	75/76		76/77		78/79		79/80		80/81		81/82		82/83	
	Total	% of												
Bonita	21	1.08%	19	1.07%	17	0.99%	15	0.81%	33	1.68%	17	0.82%	23	1.10%
Orestimba	34	1.76%	34	1.92%	30	1.75%	30	1.62%	36	1.83%	38	1.82%	49	2.34%
Haight	20	1.03%	27	1.53%	19	1.11%	23	1.25%	18	0.91%	22	1.06%	17	0.81%
White Crow	28	1.45%	22	1.24%	22	1.28%	24	1.30%	23	1.17%	21	1.01%	12	0.57%
Grayson	33	1.70%	30	1.69%	39	2.28%	51	2.76%	34	1.73%	27	1.29%	25	1.19%
Hills Ferry	36	1.86%	32	1.81%	20	1.17%	29	1.57%	35	1.78%	40	1.92%	28	1.33%
Last Chance	7	0.36%	13	0.73%										
Cleveland														
Newman														
Randall														
Gresham														
Total West Side	179		177		147		172		179		165		154	
Total County	1937		1770		1714		1847		1970		2085		2098	

**Table IV. Cont.**

<u>District</u>	% of											
	83/84	Total	84/85	Total	85/86	Total	86/87	Total	87/88	Total	88/89	Total
Bonita	22	1.00%	24	1.02%	22	0.91%	22	0.92%	25	1.04%	24	1.01%
Orestimba	42	1.91%	58	2.46%	55	2.28%	62	2.61%	70	2.92%	43	1.81%
Haight					15	0.62%	23	0.97%	28	1.17%	23	0.97%
White Crow	13	0.59%	14	0.59%	18	0.75%	20	0.84%	30	1.25%	29	1.22%
Grayson	21	0.96%	21	0.89%	24	1.00%	21	0.88%	24	1.00%	26	1.09%
Hills Ferry	29	1.32%	25	1.06%	32	1.33%	34	1.43%	26	1.08%		
Cleveland											31	1.30%
Total West Side	127		142		166		182		203		176	
Total County	2195		2354		2412		2379		2400		2376	

<u>District</u>	% of		% of									
	89/90	Total	90/91	Total	91/92	Total	92/93	Total	93/94	Total	94/95	Total
Bonita	14	0.58%	20	0.85%	22	0.93%	24	0.98%	36	1.53%	38	
Orestimba	48	2.00%	45	1.92%	43	1.81%	24	0.98%	31	1.32%	33	
Haight	11	0.46%	17	0.72%	20	0.84%	21	0.86%	29	1.23%	32	
White Crow	31	1.29%	25	1.06%	27	1.14%	25	1.02%	21	0.89%	no data	
Grayson	27	1.13%	20	0.85%	20	0.84%	23	0.94%	21	0.89%	29	
Hills Ferry												
Last Chance												
Cleveland	33	1.38%	31	1.32%	28	1.18%	24	0.98%	22	0.94%	19	
Newman	90	3.75%	100	4.26%	162	6.83%	169	6.92%	169	7.19%	170	
Randall	16	0.67%	20	0.85%	21	0.89%	15	0.61%				
Gresham							20	0.82%	23	0.98%	24	
Total West Side	270		278		343		345		352		345	
Total County	2398		2349		2371		2442		2352		no data	

**Table IV. Cont.**

<u>District</u>	% of											
	95/96	Total	96/97	Total	97/98	Total	98/99	Total	99/00	Total	00/01	Total
Bonita	43	1.88%	44	1.85%	83	3.59%	90	3.94%	94	3.98%	105	4.40%
Orestimba	30	1.31%	26	1.10%	26	1.12%	24	1.05%	19	0.81%	20	0.84%
Haight	29	1.27%	27	1.14%	29	1.25%	29	1.27%	31	1.31%	25	1.05%
White Crow	23	1.00%	32	1.35%								
Grayson	20	0.87%	20	0.84%	19	0.82%	12	0.53%	21	0.89%	20	0.84%
Hills Ferry												
Last Chance												
Cleveland	18	0.79%	25	1.05%	26	1.12%	27	1.18%	35	1.48%	30	1.26%
Newman	161	7.03%	185	7.80%	189	8.17%	192	8.41%	197	8.35%	197	8.26%
Randall												
Gresham	19	0.83%	20	0.84%	25	1.08%	22	0.96%	20	0.85%	16	0.67%
Total West Side	343		379		397		396		417		413	
Total County	2290		2373		2313		2282		2360		2384	

## Land Use

This discussion is predicated upon the section on Land Use from my earlier report (Julien, 1991). As noted therein, sheep and cattle ranching were the primary uses of land in the project area, although quicksilver mining was being carried out at higher elevations. After studying the initial transfer of lands, the accumulation of lands into large parcels and the population of the area, several additional observations can be made. Also, some information will be noted about the types of physical remains associated with activity patterns that may be associated with the study area.

The land was transferred slowly, beginning only in 1868. Land in the Access Road Area was largely transferred between 1868 and 1874. Only after 1874 do we have any appreciable information about parcelization in the Diablo Grande Project Area. Title passed to non-governmental entities largely in the period from 1874 to 1920.

However, several archaeological locations in the project area were identified by names on the map of 1876 on lands which had not yet passed from federal possession. In the Access Road Area as well, we can document a farmstead operated by Russell B. Smith in 1859 where a fairly substantial investment in agriculture had already been made (tree fruit production), although Smith did not gain title until 1868. We should therefore keep in mind that people were improving land they did not yet own. Smith did not use preemption or homestead rights, but many other individuals used these types of claim in the study area, and so, we can anticipate that individuals may have been positioning themselves on the land prior from an early date in anticipation of making such claims.

We know Smith was farming fruit and vegetable crops in 1859 (see above). These crops could be raised on lands adjacent to creeks or near artesian wells. Further South, on Orestimba Creek, early settlers were building ditches to take water out of the creek for irrigation. These ditches are still in use to provide water to land that is above any of the West side canals, including the California Water Project Canal (Boone Crow interview).

The West side valleys receive just enough cool air from the coast to be prime locations today for delicate fruit tree crops (Nuckton, 1983, p.

29; Wickson, 1909, pp. 170-171). In recent times, the area near Patterson has been a prime apricot growing location. Yields of better than 10 tons per acre are grown on the West side of Stanislaus County while the average yield for the state is only 5 tons per acre (Nuckton, 1983, p. 27). The area is also suited for sweet cherry production. Other crops, like peaches, nectarines and plums can be grown, but these fruits are less delicate and do as well in other San Joaquin Valley locations.

The reason why this part of the San Joaquin Valley is being planted to orchard crops now is due to the urbanization of the Santa Clara Valley, formerly the most productive region in the state for these specialty fruit crops. Santa Clara was always more prominent than the West side valleys, but some of these crops were certainly grown in earlier years on the West side of Stanislaus County (Nuckton, 1983, pp. 25-27).

Fruit canning began in California in the 1860s, but began to expand noticeably only from 1880 onward. Drying, particularly in the case of apricots, plums and raisins was a major means of processing fruit throughout the late 19th Century. Although orchard canning was a feature of the California industry, it had largely passed out of sight by 1910. By that time, fruit growing and fruit canning were done by different parties (Wickson, 1909, p. 373). Fruit was harvested and transported elsewhere, though there were many small canneries.

Drying, on the other hand, continued to be a ranch operation. Fruit was dried in the sun on trays. Often trays were laid directly on the ground in the orchard, but, on some ranches, a drying floor was levelled and trays were brought to a central location. Until about 1908 the only structures which may have been related to a drying operation was a cutting shed, to house the people who halved the fruit. After that time, sulphuring came into common use. It was done in a special cabinet that accommodated a number of fruit trays at a time. After igniting on a shovel or a small pot, the burning sulphur was put in a pit in the ground under the cabinet. Often, rail lines were used to transport the trays to the sulphuring cabinets. Some fruits, particularly prunes, were dipped. A drying operation could also include packing in boxes, and hence, a packing shed (Wickson, 1909, pp. 374-379).

Today, a cherry orchard occupies the land that was once cultivated by Russell B. Smith. The orchard was developed by the present owner,

Donald J. Smith, about seven years ago. Before the orchard was developed, melons were cultivated in alternate years, going back to the 1960s when the present owner purchased the property. During the tenure of the present owner and before it, water has been pumped up from the California Water Project Canal because the local supply is insufficient and because the quality of water from Salado Creek and local wells is low (Donald J. Smith interview).

Both of these factors would have influenced land use in the past, but clearly did not prevent cultivation. Evidence for land levelling or ditches might be sought, especially in the Access Road Area, to confirm this type of use.

On the basis of surviving documentation, the preponderant use of land in the study area was as range for livestock, and in particular, for sheep. We can speculate that this use pattern is also early. Russell B. Smith was probably already engaged in stock-raising in 1859. He was certainly using the hilly areas of his property as sheep range at the time of his death in 1876.

The locations shown on the 1876 road map in the project area are not all labelled "sheep camp", but given the later use of the area for grazing stock, it is probable that these places were used in some connection with stock raising. In my earlier report (Julien, 1991) I noted that the route of the Oak Flat and Adobe Valley Road followed the route of an earlier road, at least through the Oak Flat area. Because the camps are located along what appears to have been a major route from the San Joaquin Valley to the Santa Clara/San Jose area, perhaps these camps were important watering or overnighting places for drives from the San Joaquin Valley to the urban markets. Alternatively, these camps may have been used (as locations in this area certainly were, later) in a seasonal grazing regime that involved use of pastures on the San Joaquin Valley plains as well as in the Sierra Nevada.

The passage of the No-Fence Law in 1868 and the transfer of federal lands on the San Joaquin Valley plains to grain farmers probably put additional pressure on grazing land in the hills (see Julien, 1991, p. 9). Purchase of lands in the Coast Range and in the Sierra began to occur, favoring those who had the ability to purchase grazing land (letters of Mariner and Hays, in Salmon, 1892, pp. 966, 970). This period is precisely

the time when the hill lands were surveyed and transfer from federal possession began. Because of the requirements of federal legislation, the parcels granted were usually no more than 160 acres in extent.

While the object of distributing small parcels to individuals was to create family farms, a parcel of this size is really too small to be used for grazing purposes. The process of transfer began immediately and resulted in the buildup of two large parcels in the Project Area by the turn of the century. The degree to which any of the small holders actually resided on the land is in doubt, but many of their names appear in the federal censuses of 1880 and 1900, and the school censuses tend to indicate that a number of small-holders or tenants actually resided in the area.

The accumulation of two large holdings in the Diablo Grande Project Area by the turn of the century was not inevitable. Middle-sized properties like the one owned by John W. Sharp are another outcome, so we need to explain what may have happened in this case.

Herding proved to be a risky business in California. Two severe droughts, one in 1864 and the other in 1877, probably had an effect on the ranching business. Those who wanted to invest capital from other enterprises in land probably held the advantage over small holders who lost their stock, and, if that was their only business, also their livelihood, during periods of extended drought. Also, 40% of the land in the project area was initially owned by the railroad. Cold, hard cash in large amounts was what it took to buy railroad land, and only individuals with substantial resources could have or would have bought land at railroad prices.

Exclusive dependence on stock-raising would have been a problem given cyclical drought, and we have evidence that those who had medium-sized holdings in the study area were also engaged in farming on the plains. From the probates of several estates (Smith, Jones, Stephen Rogers) and descriptions in the biographical histories, we can tell that a West side ranch in the hill country was an adjunct to a farming operation on the plains. Even major woolgrowers like A. D. Stonesifer and J. D. Patterson relied on a mixed farming/stock raising regime.

Stonesifer should be mentioned, since some of his range was located just to the East of the Southern Project Area. Stonesifer was described in

a biographical history of the San Joaquin Valley as the "king of the sheep industry" (Guinn, 1905, pp. 1497-1498). Stonesifer, a Pennsylvania native, settled on Orestimba Creek (in Section 17, Township 7 South, Range 8 East; see Hall map, 1877) and began ranching common sheep in Stanislaus County in the Fall of 1865. He did extremely well and soon after made a \$4,000 investment in French Merino sheep (Branch, 1881, pp. 201).

In 1881, Stonesifer's land "was most all pasture land", referring surely to Stonesifer's ranch on Orestimba Creek (Branch, 1881, p. 201; see lithograph facing p. 204 as well). Stonesifer continued to acquire land on the plains, including a large Orestimba Rancho parcel (1252 acres) which he bought from Timothy Paige in 1887 for \$37,500 (Stanislaus County, Deeds, 38-73). He also acquired entire sections in the hills East of the Southern Project Area (Douglass and Perley, 1895).

J. D. Patterson, who purchased 18,000 acres of the former Del Puerto Rancho in 1866 and later increased his holdings in that property to 30,000 acres (Wentworth, 1948, p. 186), was the other large sheep rancher on the West side of Stanislaus county (see also, Julien, 1991, pp. 5-6; United States, 1892, pp. 378-381). Patterson probably also supplemented his rancho lands with grazing land in the West side hills; we can document that he leased range from the Smith estate in the 1880s (see Appendix III). Patterson also owned a 3,000 acre sheep ranch in the Livermore Valley (Wentworth, 1948, p. 559), and his range needs may have been largely met on his own lands.

Two patterns have been documented so far: one of mixed agriculture with stock raising as an adjunct to larger-scale cultivation of grain or other crops on the valley plain, and the other of large-scale stock raising relying on pasture land adjacent to the San Joaquin River, but making some use of grazing lands in the Coast Range. A third pattern is suggested by the operation of Manuel Rogers whose only agricultural endeavor appears to have been stock raising. Presumably, he would have rented stubble on the plains for summer grazing.

All three patterns made use of parcels of grazing land in the West side hills. In the case of the first and third patterns just described, the size of parcels in the 1890s varied between 1800 and 3000 acres. While many variables are involved in determining parcel size and we cannot

isolate any in particular, the estimate given is valuable since it suggests that smaller operations were nonviable. Small holdings had a very short trajectory.

None of the patterns noted above requires the permanent residence of very many people, and the equipment and construction required may have been minimal. Fencing became necessary, but there may have been little investment in fencing until the 1890s. In 1910, the "sheep-proof" fence began to be built which began to reduce investment in personnel for herding. The sheep-proof fence was built of 30-36" mesh wire at the bottom with barbed wire above at 4-8" intervals. The initial cost was high, but two range and fence riders could care for approximately the same number of sheep as 10 herders and camp tenders. Also, lambs raised under fence weighed from 5 to 15 pounds more than herded lambs since the sheep were less likely to bunch together and would distribute themselves better across grazing land (Wentworth, 1948, p. 408).

Other construction on a ranch might include lambing and shearing sheds. The success of a sheep operation often depends on the ability to keep lambs alive, particularly in the West where ewes could not consume sufficient grass to nourish twins. Where specialized lambers were not available for the seasonal task, shed lambing became common so that the lambs could receive the attention they needed. Purebred herds made use of shed lambing first, but sheds came into common use in commercial operations around the turn of the century (Wentworth, 1948, pp. 409-412).

Shearing was another time that required additional personnel, as well as special buildings and pens. Sheep could be shorn at pens on the major market trails or at rail shipping points as well as in the hills, so there need not have been any sheds in the grazing areas. However, there were shed operations in the West side hills in Merced County in the 1920s, if not earlier, and there may have been similar operations in the study area. Sheds were typically long and narrow and surrounded by pens. After clipping, the wool was packed into sacks about eight feet long, the sack being hung vertically from a tall wooden frame for packing. Shearers also had to be boarded (Wentworth, 1948, pp. 420-421). Shearing was done in both the Spring and the Fall (Wentworth, 1948, p. 421; United States, 1892, p. 971).

Sheep dipping also occasioned construction. Dipping was done to combat scab and ticks and was commonly done at the time of shearing (Wentworth, 1948, p. 451). By 1899, dipping was widely required by federal regulations (Wentworth, 1948, pp. 450-458). Sheep were fed into a trough from a corral and waded through a neck-deep bath of lime-and-sulfur or nicotine-and-sulfur (Wentworth, 1948, p. 414, fig. 109 on p. 453; United States, 1892, plate facing p. 960, p. 971). Troughs were commonly made of cement.

## Conclusions

While the amount of specific information that has turned up about archaeological locations is disappointing, research in historical documentation has provided a great deal of information that can be used to establish a context for historical sites located through archaeological survey. Also, a knowledge of parcel boundaries can aid in the design of an intensive survey program, particularly in the case of small holdings where it may be presumed that "improvements" to the property will be located near sources of water.

One of the difficulties with the current survey of historical records (as with the prior one) was complete lack of information from Assessor's records. These records would have given indications of "improvements" such as buildings, fences, etc., on the land, are not available for Stanislaus County.

Another difficulty that emerged during the second round of historical research was the transfer of property to relatives prior to the death of a holder or incorporation of an estate prior to death, since both these events prevent a parcel from being part of a probate procedure. For these reasons, little detailed information about Oak Flat Ranch was available for the period from 1875-1925. This parcel was the largest property in the northern project area.

Yet another obstacle was presented by the loss of records in San Francisco due to the earthquake and fire of 1906. Records for the parcel held by Timothy Paige, the largest property in the southern project area,

would have been available, since his estate went through probate beginning in 1892, were it not for this catastrophe.

In the event that particular sites within the project area should be mitigated with archaeological excavation, several courses may be pursued to recover more specific historical data. The complete recording of patent transfers will facilitate any additional deed searching. A considerable number of deed transfers have been documented in the case of large parcels, a strategy chosen because more territory could be analyzed in a relatively short period of time. A knowledge of who owned the property occupied by an archaeological site or who the neighbors were can be used to find individuals with oral information, documents and photographs that can be used to reconstruct physical remains and use patterns at a specific site.

More information about land use may be contained in lease records held by the Southern Pacific Railroad, if this documentation has been preserved. Information about leasing on the two large private parcels in the project area, which presumably occurred from 1890 onwards, could also be sought from long-time residents in the area or from the local or state Woolgrower's Association.

While our study has suggested a largely extensive pattern of land use and a relatively sparse population (even in the 1890s when the number of people living in the area was at its peak), the project area was economically important during the late 19th Century when the California sheep industry developed. In addition, the area of the access road appears to have been one location where very early (prior to the 1870s) irrigation agriculture occurred. Very little archaeological study of these use patterns has occurred, so the data recovered in these areas about these activities is potentially important and particular attention should be given to identifying physical remains which will inform us about them.

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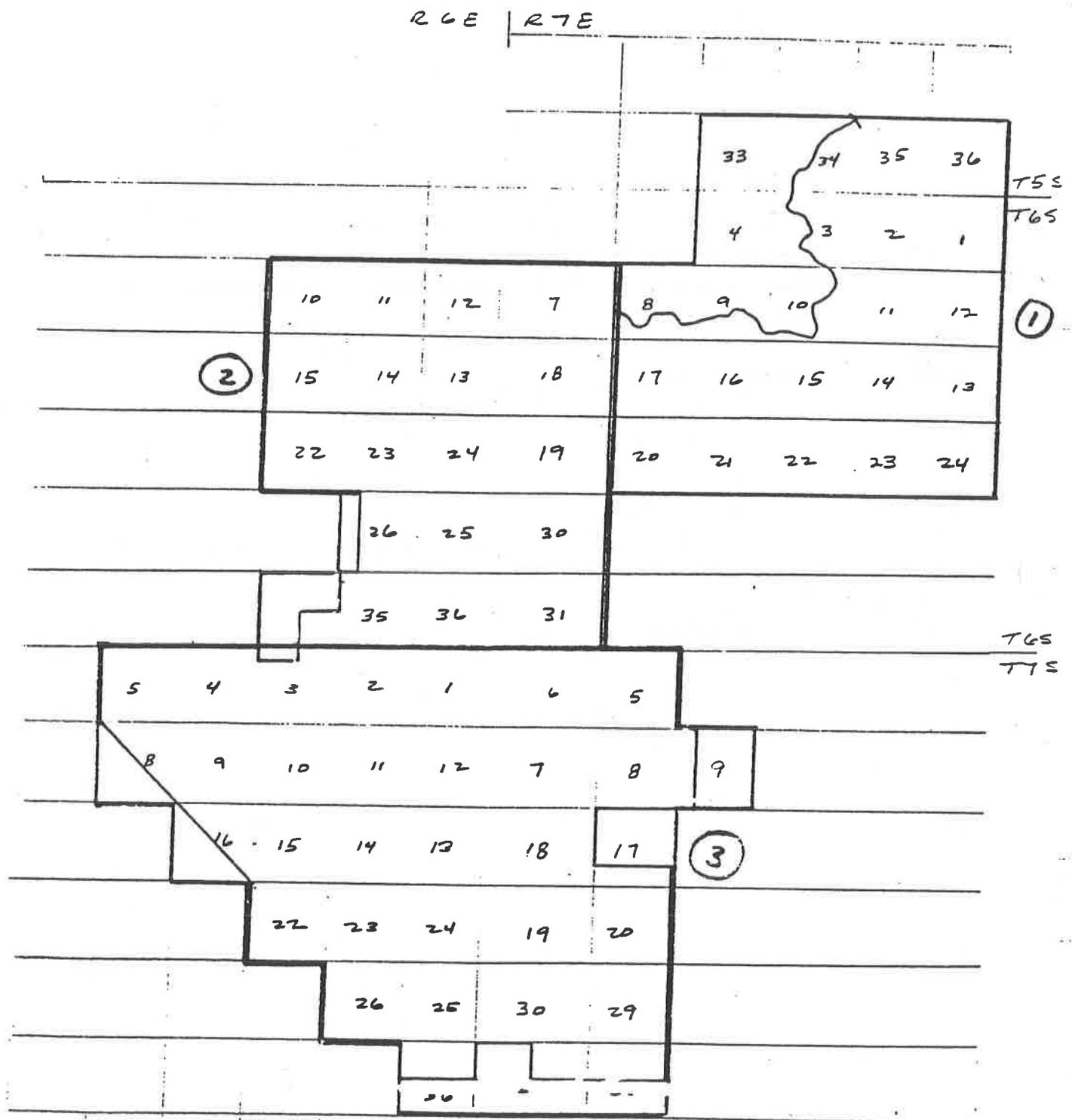
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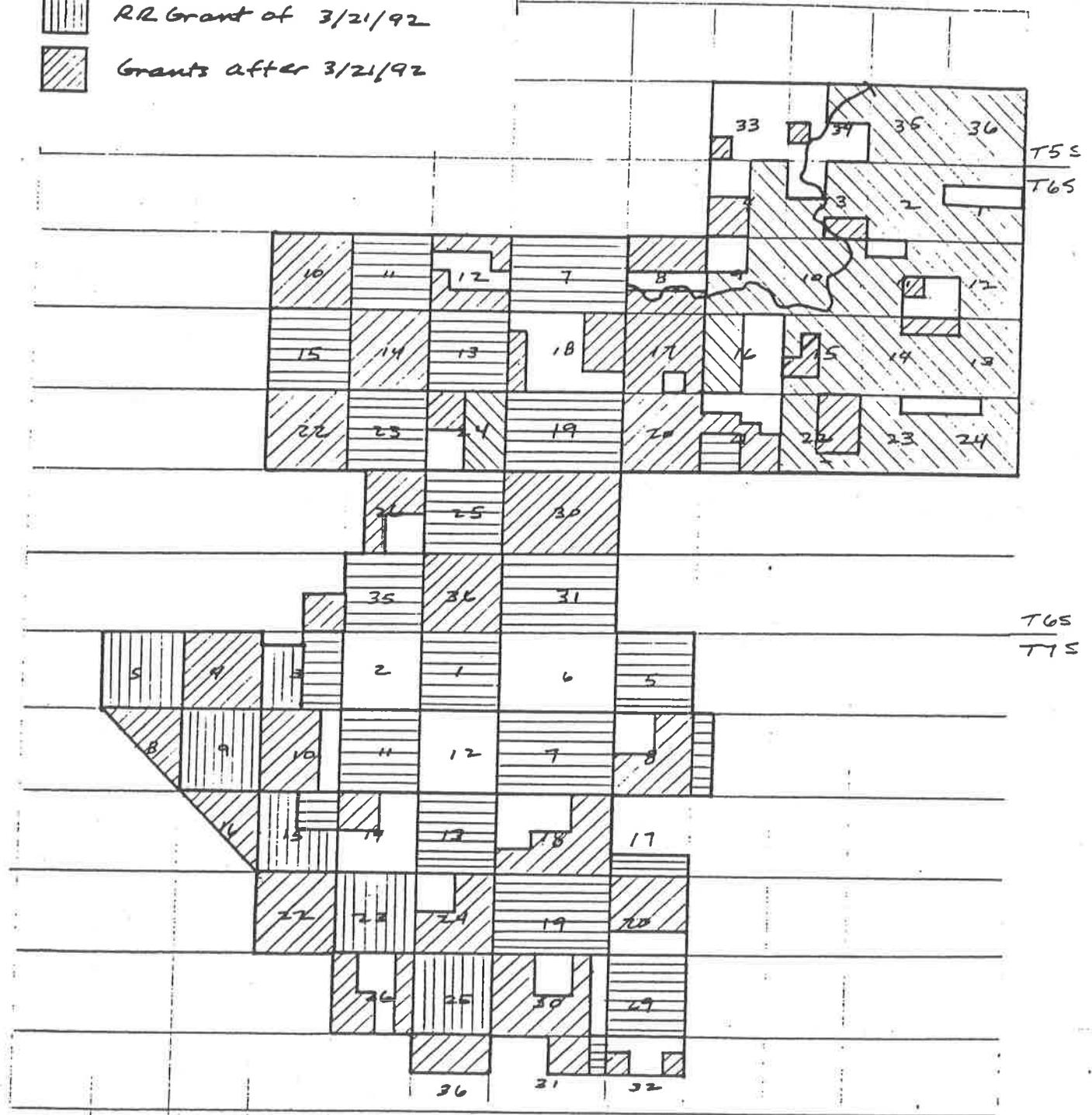
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Map 1. Division of the Area Affected by the Diablo Grande Project for Study Purposes.

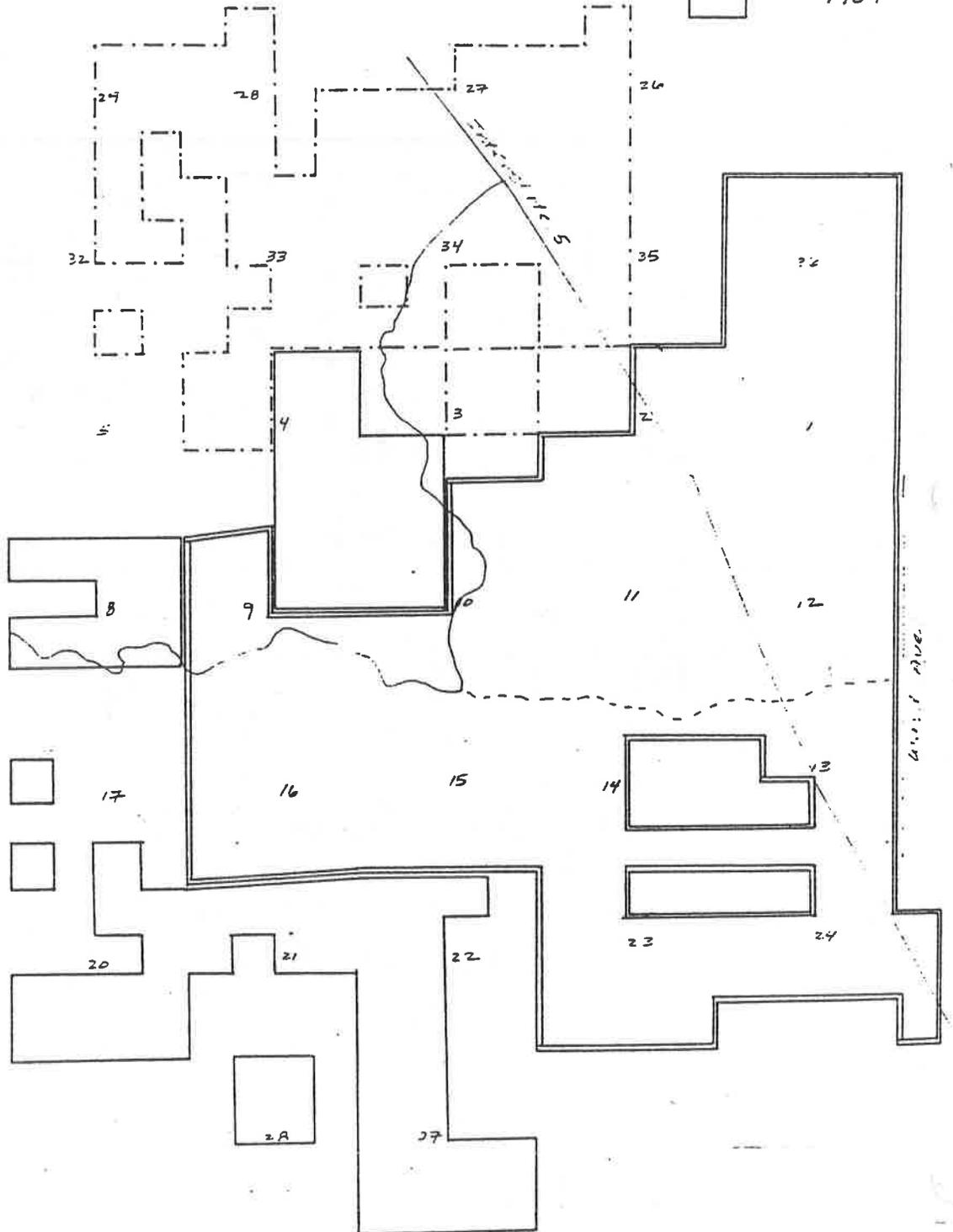
-  Grants from 11/12/68 to 4/20/75
-  R.R. Grant of 4/20/75
-  Grants from 4/21/75 to 3/21/92 R 6 E R 7 E
-  R.R. Grant of 3/21/92
-  Grants after 3/21/92

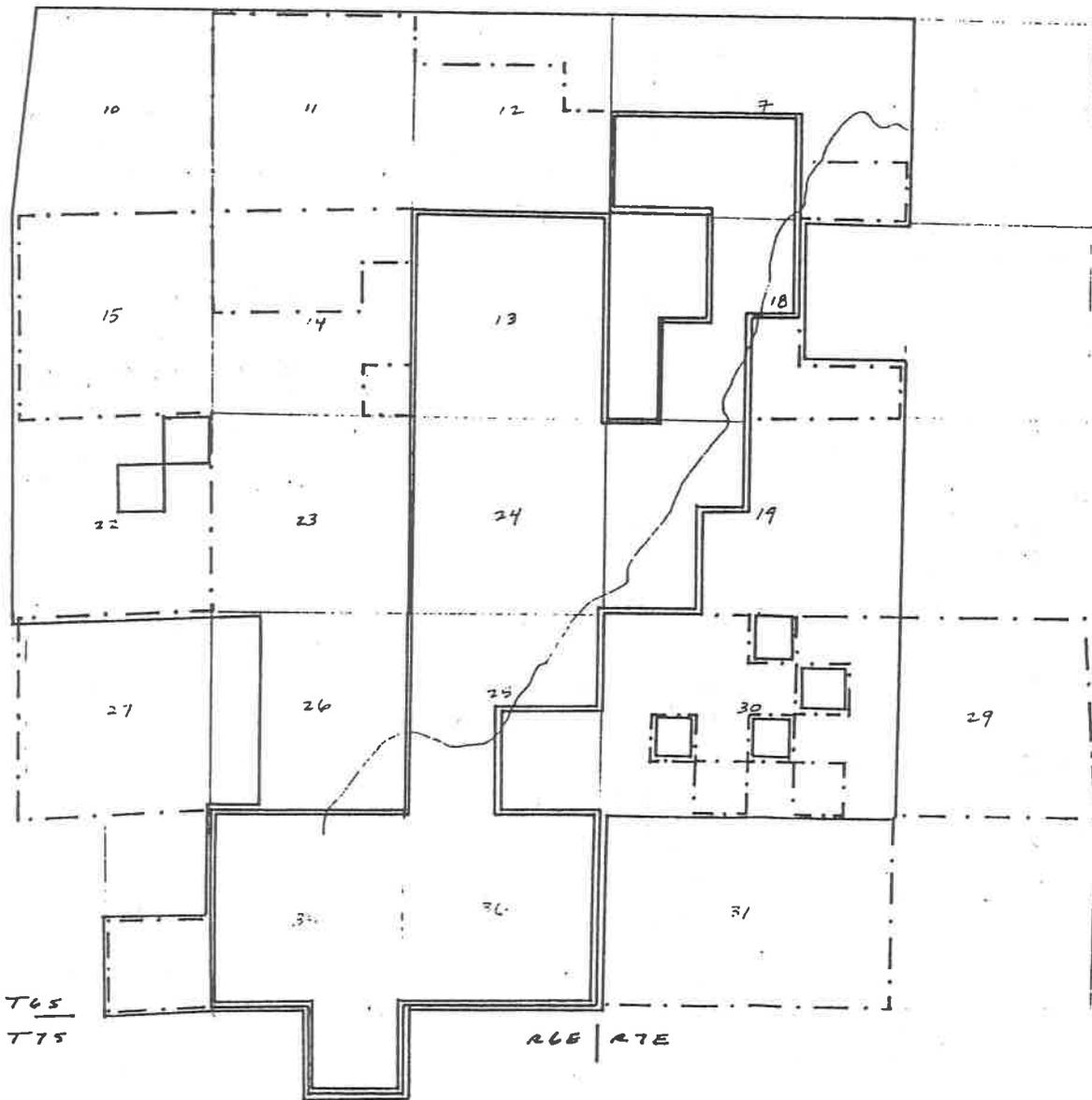


map 2. Initial Transfer of Land in the Study Area.

map 3. Access Road Area.

-  Russell B. Smith  
1876
-  John W. Jones  
1882
-  Manuel Rogers  
1907





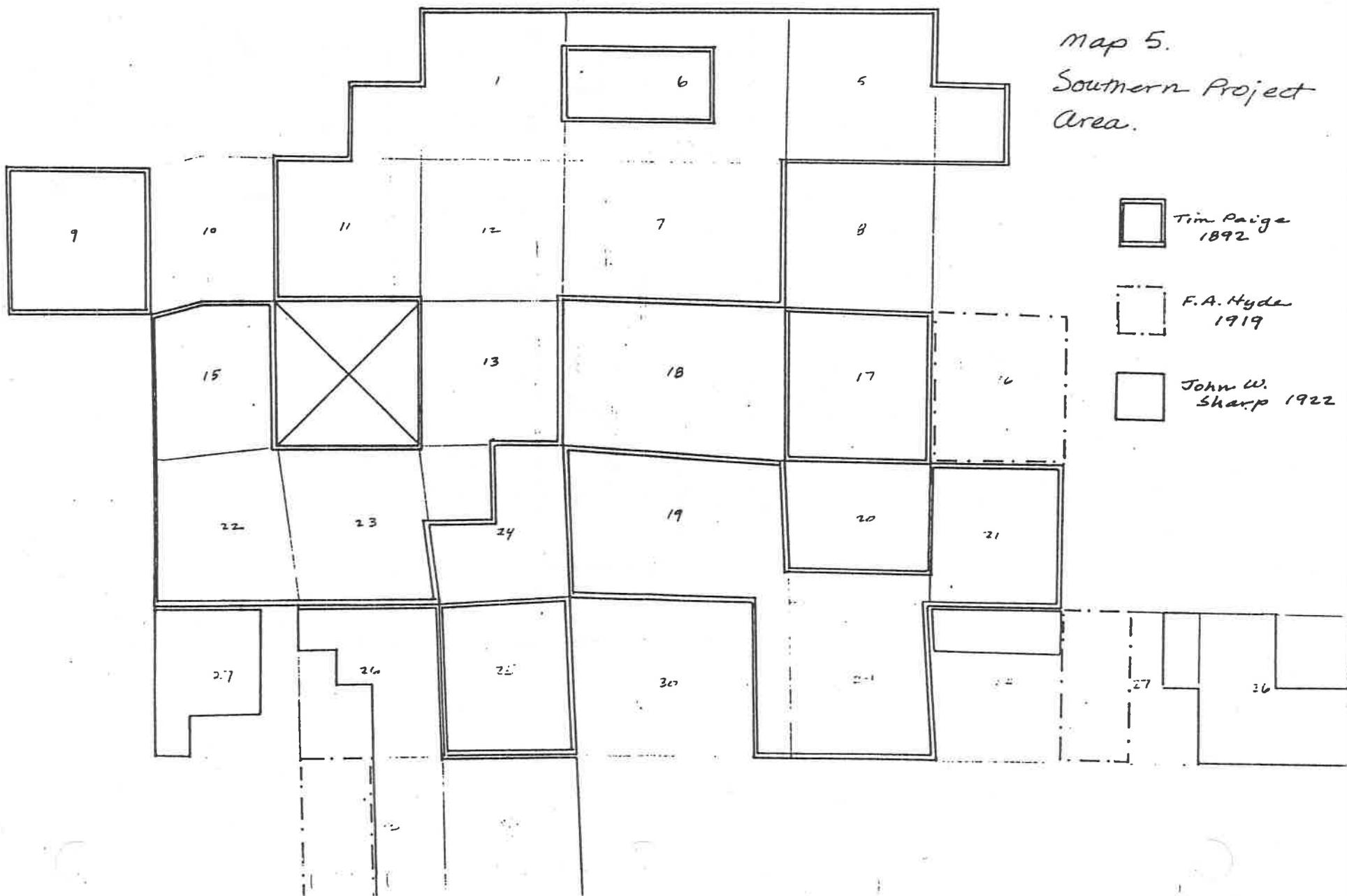
-  Oak Flat Ranch  
Stephen Rogers  
1886
-  Frederick A.  
Hyde  
1919
-  Sodie P. Arkbios  
1935

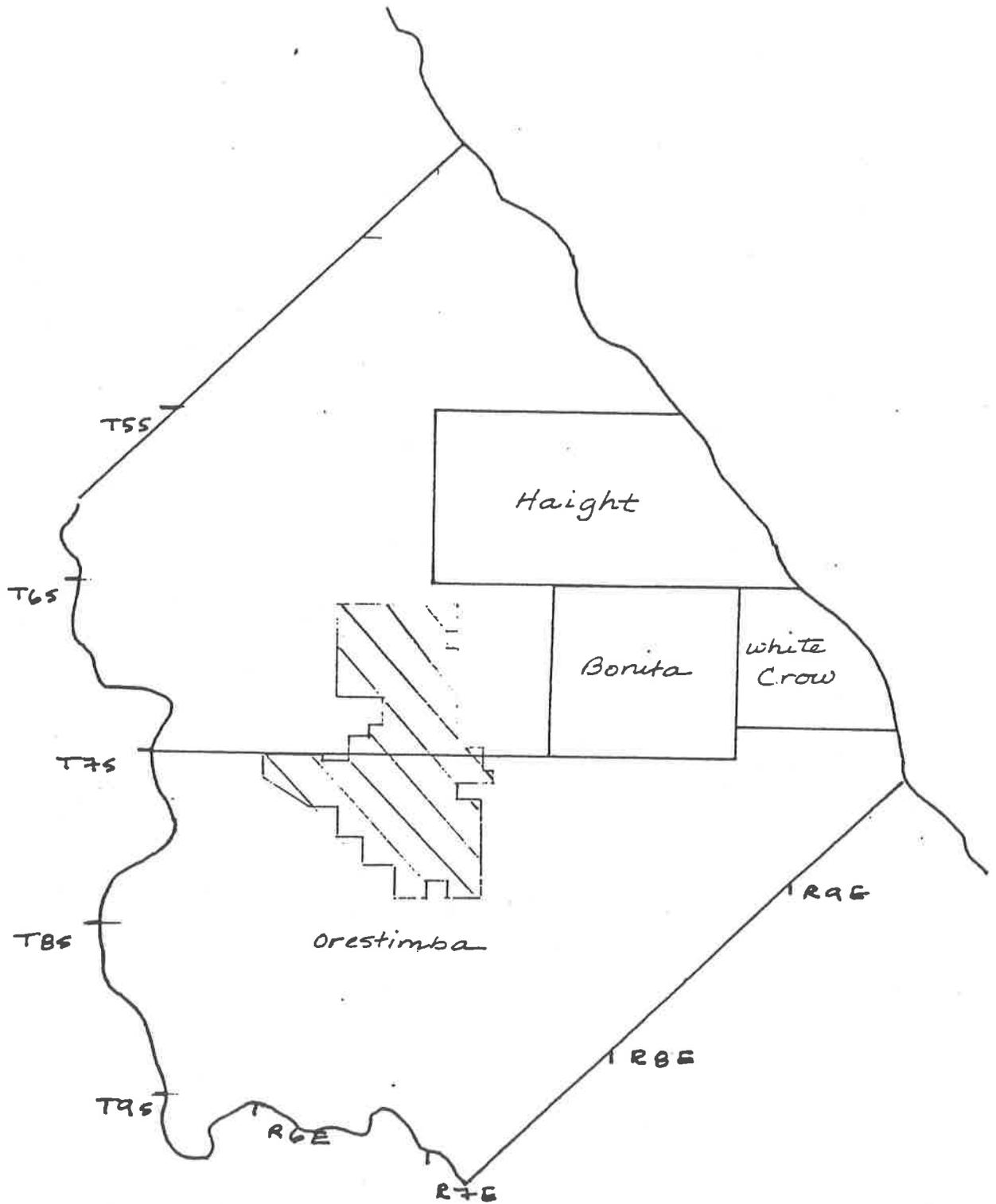
Map 4: Northern  
Project Area.

T65  
T75

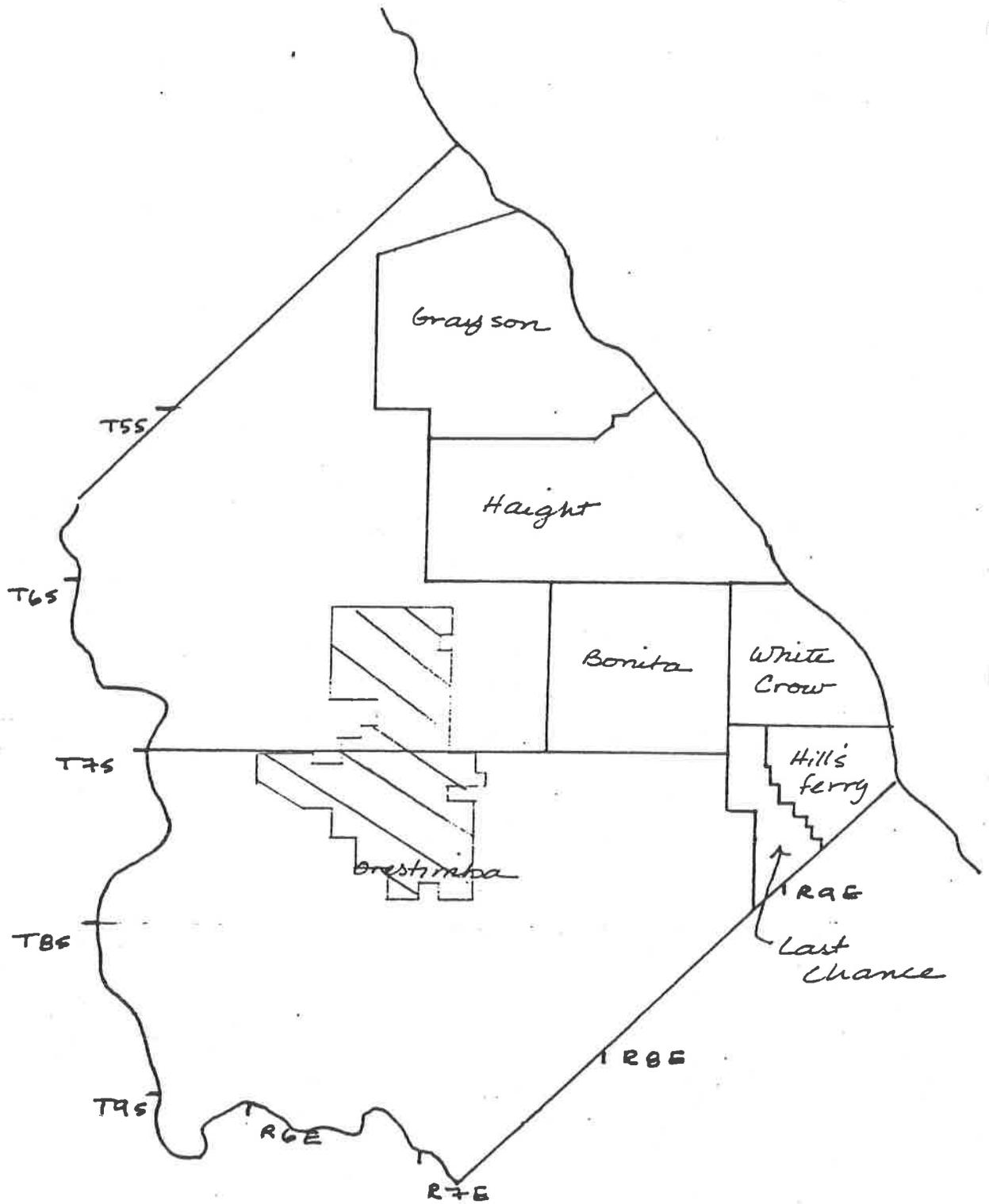
R66 | R7E

Map 5.  
Southern Project  
Area.



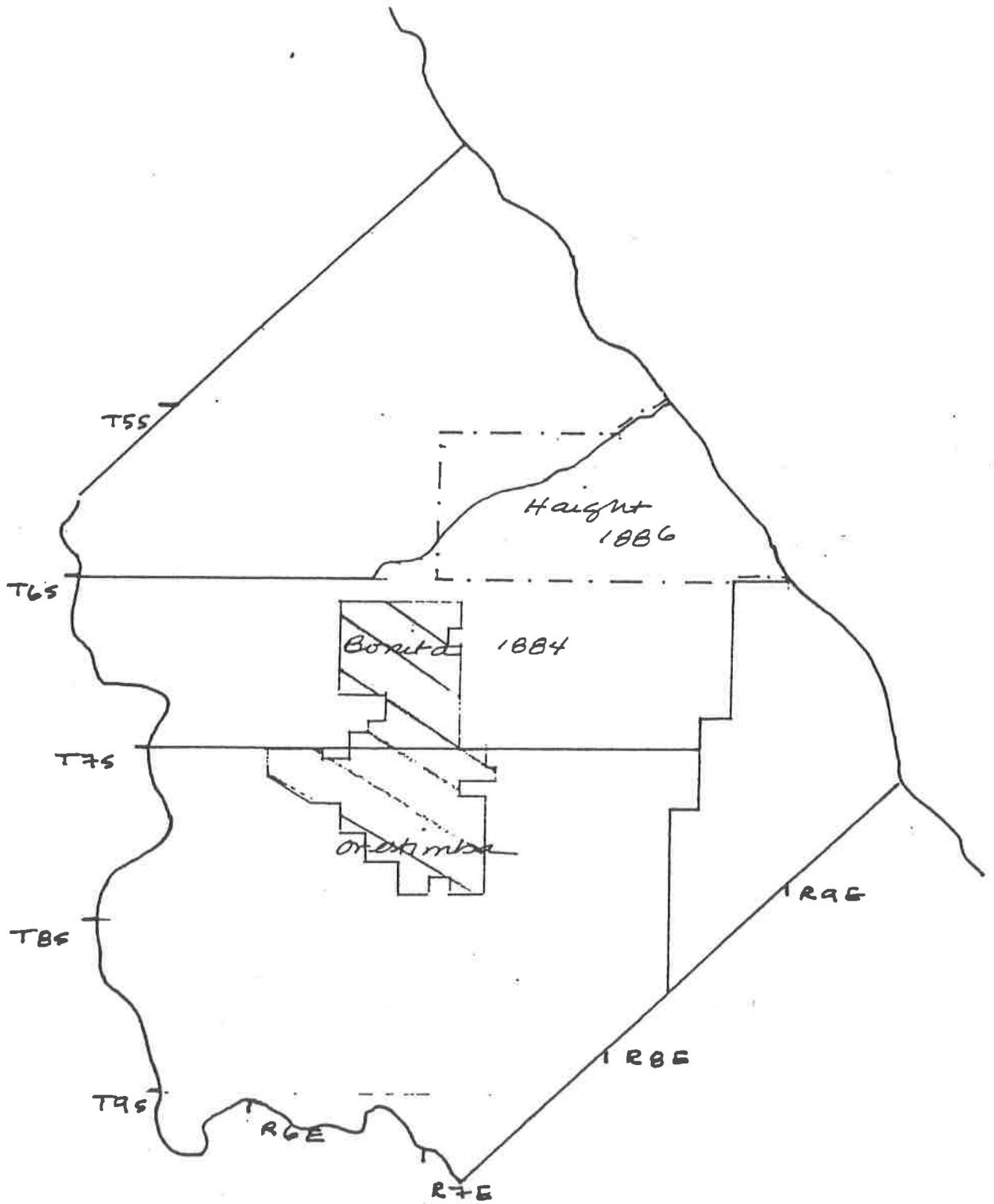


Map 6.  
 School District Boundaries, 1871.



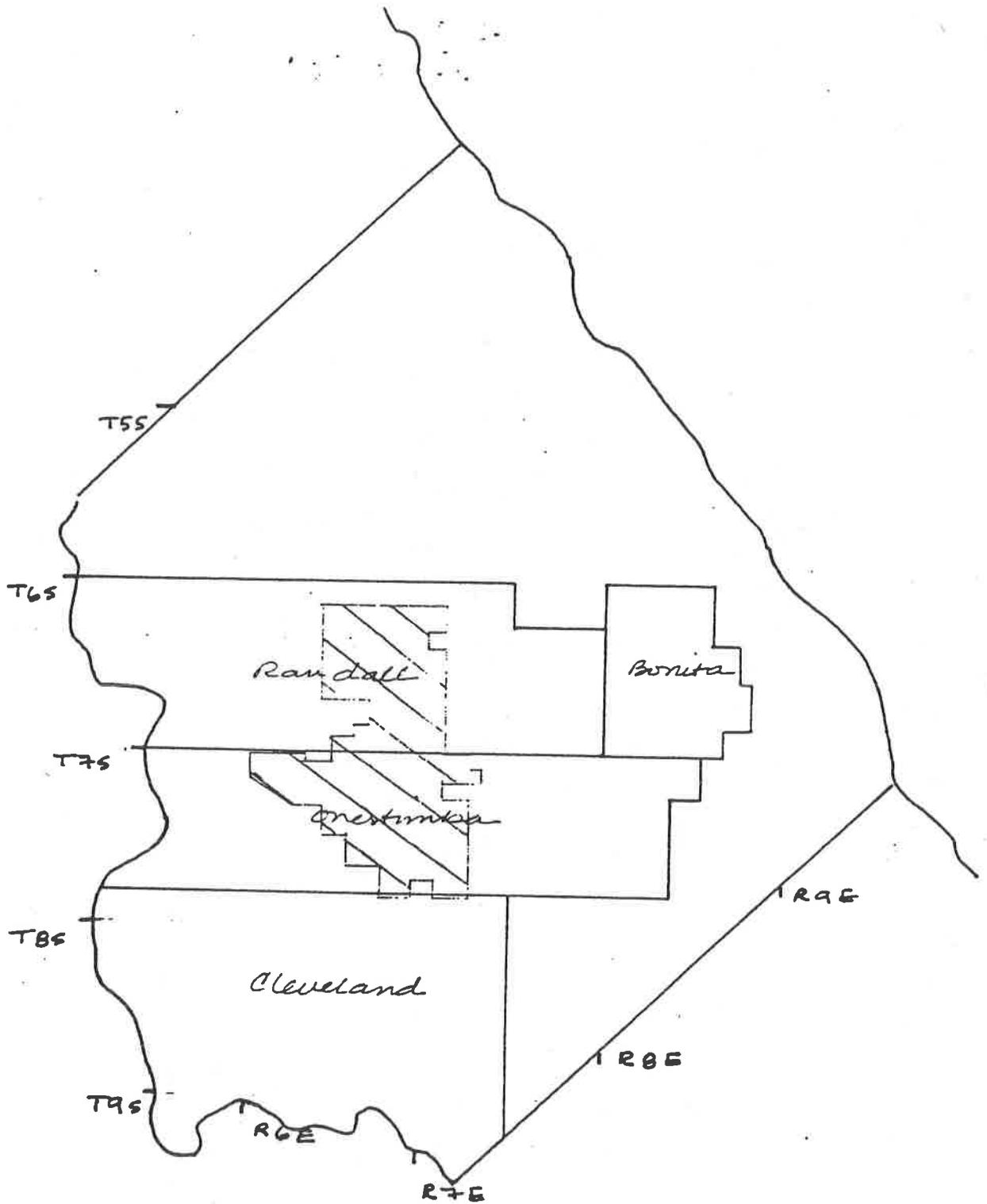
Map 7.

School District Boundaries, 1877.

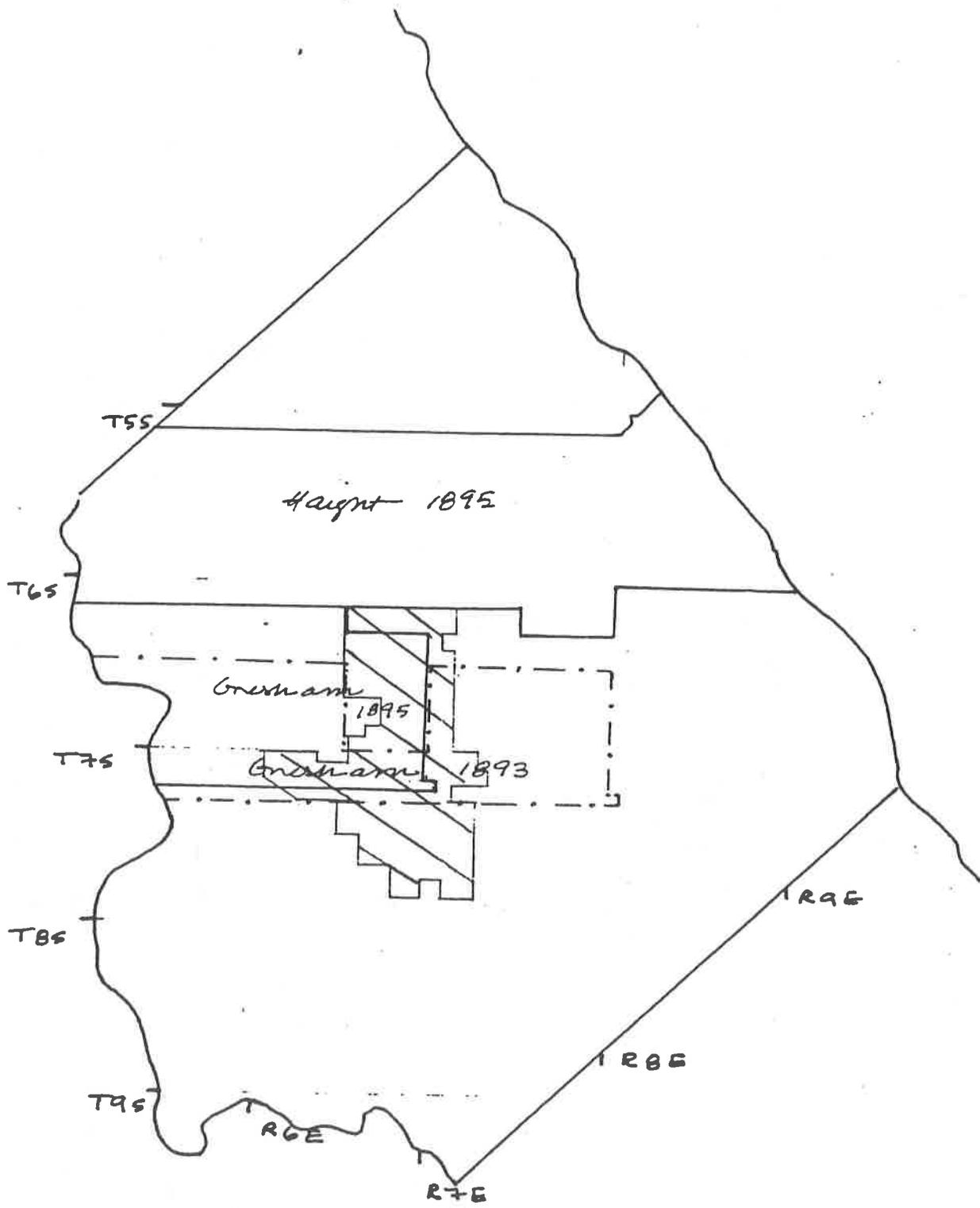


Map B.

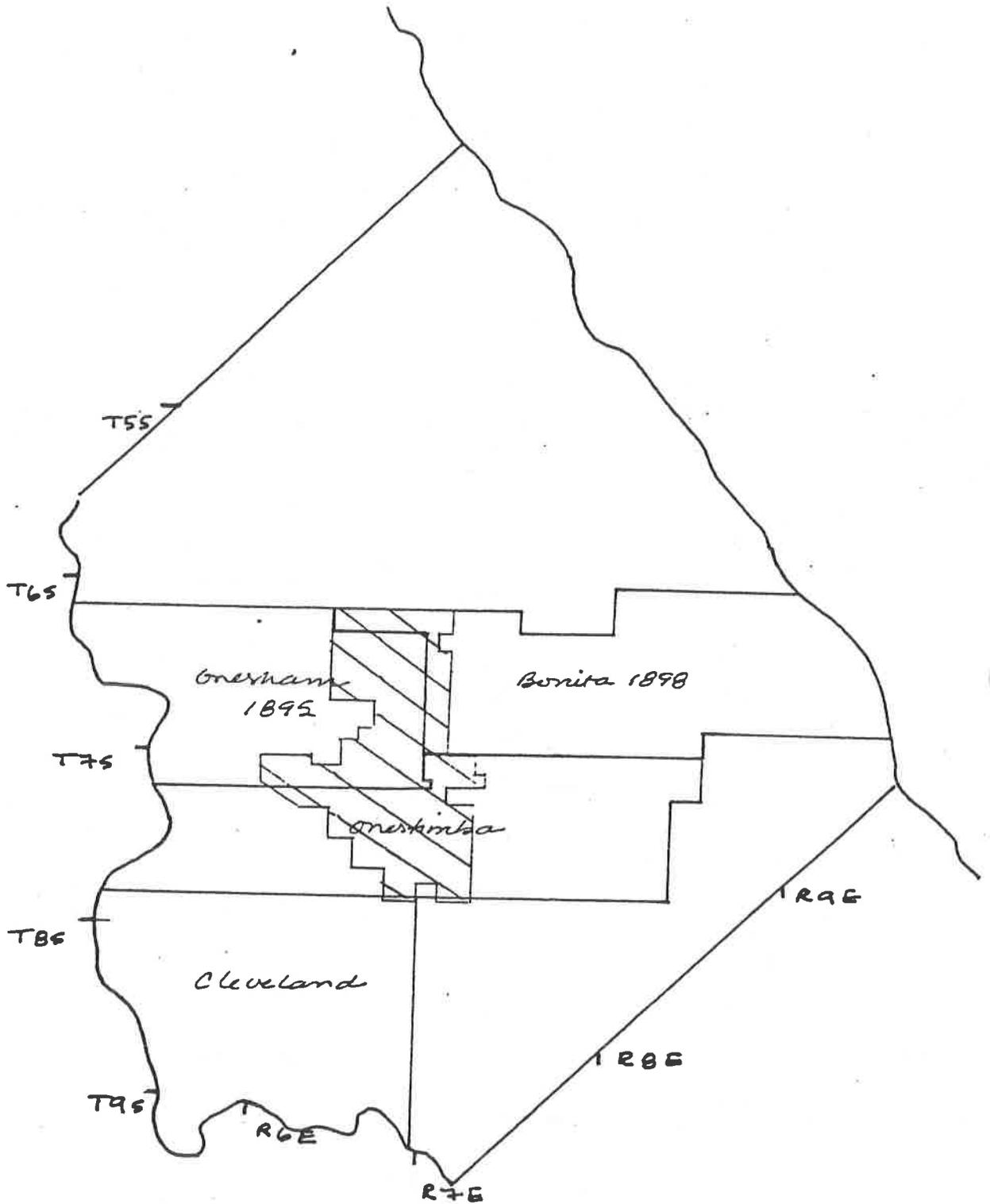
School District Boundaries, 1886 (incomplete).



Map 9.  
School District Boundaries, 1892.



Map 10.  
 School District Boundaries, 1895 (incomplete).



Map 11. School District Boundaries, 1900 (incomplete).

**Appendix I. Patents Issued in the Study Area.**

**Access Road Area**

<u>Ref #</u>	<u>Grantor</u>	<u>Grantee</u>	<u>T</u>	<u>R</u>	<u>Sec</u>	<u>Fraction</u>	<u>Acres</u>	<u>Instr</u>	<u>Date</u>	<u>Rec Date</u>	<u>Basis of Grant</u>
10-148	US	John D Woodward	5	7	33	W1/2 of NW1/4	80	10/24/94	8/22/04		Hstd #2568, app 5074
10-161	US	Chas D Eilers	5	7	33	SW1/4 of SW1/4	40	1/19/05	4/3/05		act of 4/24/20
9-558	US	William Erwin	5	7	33	S1/2 of SE1/4	80	12/15/75	10/22/96		act of 4/24/20
9-558	US	William Erwin	5	7	33	NE1/4 of SE1/4	40	12/15/75	10/22/96		act of 4/24/20
6 77	US	Geo C Dawson	5	7	33	NW1/4 of SE1/4	40	2/1/76	9/5/79		act of 4/24/20
6 77	US	Geo C Dawson	5	7	33	N1/2 of SW1/4	80	2/1/76	9/5/79		act of 4/24/20
6 77	US	Geo C Dawson	5	7	33	SE1/4 of SW1/4	40	2/1/76	9/5/79		act of 4/24/20
9-549	US	Curtis N Hunt	5	7	33	S1/2 of NE1/4	80	2/1/95	10/22/96		act of 4/24/20
9-549	US	Curtis N Hunt	5	7	33	E1/2 of NW1/4	80	2/1/95	10/22/96		act of 4/24/20
9-550	US	Curtis N Hunt	5	7	33	N1/2 of NE1/4	80	2/1/95	10/22/96		act of 4/24/20
9-558	US	William Erwin	5	7	34	SW1/4 of SW1/4	40	12/15/75	10/22/96		act of 4/24/20
9-550	US	Curtis N Hunt	5	7	34	W1/2 of NW1/4	80	2/1/95	10/22/96		act of 4/24/20
4-125	US	Andrews Willows	5	7	34	NE1/4	160	1/2/74	8/5/75		school scrip-Virginia
9-554	US	John D Cox	5	7	34	E1/2 of NW1/4	80	9/10/75	10/22/96		act of 4/24/20
9-554	US	John D Cox	5	7	34	E1/2 of SW1/4	80	9/10/75	10/22/96		act of 4/24/20
10 47	US	John McCaffrey	5	7	34	SE1/4	160	10/2/91	11/3/00		act of 4/24/20
10-101	US	William Davidson	5	7	34	NW1/4 of SW1/4	40	10/23/01	3/18/03		Hstd #3312, ap 6234
2-504	US	Charles Bronson	5	7	35	SE1/4	160	8/15/72	11/25/72		act of 4/24/20
2-572	US	James Willows	5	7	35	NW1/4	160	1/5/72	3/24/73		school scrip - New York
3-405	US	Thomas H Clayton	5	7	35	SW1/4	160	1/5/72	8/14/74		school scrip - Connecticut
5-478	US	Andrew Newhall	5	7	35	NE1/4	160	2/15/73	3/22/79		school scrip - Virginia
3-477	Cal	Russell B Smith	5	7	36		640	11/27/72	10/28/74		various acts
2-242	US	Jesús García	6	7	1	W1/2 of SW1/4	80	11/5/70	12/28/71		act of 4/24/1920
3-477	Cal	Russell B Smith	6	7	1	E1/2 of SE1/4	80	11/27/72	10/28/74		various acts
1-365	US	Morris Rosenberg	6	7	1	W1/2 of SE1/4	80	5/20/69	3/4/70		act of 4/24/20
1-365	US	Morris Rosenberg	6	7	1	E1/2 of SW1/4	80	5/20/69	3/4/70		act of 4/24/20
3-536	Cal	Russell B Smith	6	7	1	frac N1/2 of NW1/4	79.2	11/28/74	12/11/74		various acts
3-536	Cal	Russell B Smith	6	7	1	frac N1/2 of NE1/4	79.2	11/28/74	12/11/74		various acts
10-305	US	Augustus Bronson	6	7	1	S1/2 of NE1/4	80	9/10/80	1/11/13		act of 4/24/20

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10-305	US	Augustus Bronson	6	7	1	S1/2 of NW1/4	80	9/10/80	1/11/13		act of 4/24/20
10-301	US	Frank McCaffrey	6	7	2	S1/2 of SE1/4	80	2/1/75	1/11/13		act of 4/24/20
10-301	US	Frank McCaffrey	6	7	2	S1/2 of NW1/4	80	2/1/75	1/11/13		act of 4/24/20
3-536	Cal	Russell B Smith	6	7	2	frac N1/2 of NE1/4	79.2	11/28/74	12/11/74		various acts
3-536	Cal	Russell B Smith	6	7	2	frac N1/2 of NW1/4	79.2	11/28/74	12/11/74		various acts
3-477	Cal	Russell B Smith	6	7	2	S1/2 of NW1/4	80	11/27/72	10/28/74		various acts
3-477	Cal	Russell B Smith	6	7	2	S1/2 of NE1/4	80	11/27/72	10/28/74		various acts
3-477	Cal	Russell B Smith	6	7	2	N1/2 of SW1/4	80	11/27/72	10/28/74		various acts
10-166	US	Wm G Gilbert	6	7	3	N1/2 of SE1/4	80	12/30/02	7/27/05		Hstd #3329, app 6560
9-552	US	Thos H Clayton	6	7	3	NE1/4	158.85	2/1/75	10/22/96		act of 4/24/20
9-110	US	J Henry Zacharias	6	7	3	NW1/4	159.61	5/5/75	12/24/90		school scrip - Mississij
8-354	Cal	Benj M Hartshorn	6	7	3	SW1/4	160	8/16/81	1/9/87		school scrip - Californi
3-501	US	Saml McVey	6	7	3	S1/2 of SE1/4	80	4/30/74	10/26/74		act of 4/24/20
9-557	US	Geo W Finch	6	7	4	NW1/4	166.2	2/1/76	10/22/96		act of 4/24/20
8-352	Cal	Benj M Hartshorn	6	7	4	E1/2	320	11/12/68	1/9/87		school scrip - Californi
10 88	US	Andrew Boynton	6	7	4	SW1/4	160	3/23/01	6/13/02		Hstd #3195, app 6171
10-216	US/Cal	Manuel Rogers	6	7	8	SE1/4 of NE1/4	40	10/4/07	10/11/07		various acts
10-216	US/Cal	Manuel Rogers	6	7	8	N1/2 of NE1/4	80	10/4/07	10/11/07		various acts
10-216	US/Cal	Manuel Rogers	6	7	8	SW1/4 of NE1/4	40	10/4/07	10/11/07		various acts
10-216	US/Cal	Manuel Rogers	6	7	8	S1/2 of NW1/4	80	10/4/07	10/11/07		various acts
10 36	US	Wm S McCann	6	7	8	SE1/4 of SW1/4	40	6/25/92	2/3/00		act of 4/24/20
10 36	US	Wm S McCann	6	7	8	SW1/4 of SE1/4	40	6/25/92	2/3/00		act of 4/24/20
8-122	US	Wallace B McKenney	6	7	8	N1/2 of SE1/4	80	3/1/78	4/24/85		act of 4/24/20
8-122	US	Wallace B McKenney	6	7	8	N1/2 of SW1/4	80	3/1/78	4/24/85		act of 4/24/20
11-300	US	Robt Smith	6	7	8	SW1/4 of SW1/4	40	2/20/30	4/22/31		Hstd
11-300	US	Robt Smith	6	7	8	SE1/4 of SE1/4	40	2/20/30	4/22/31		Hstd
11-110	US	Wm C Peall	6	7	8	N1/2 of NE1/4	80	9/29/22	3/28/24		Hstd
11-110	US	Wm C Peall	6	7	8	SW1/4 of NE1/4	40	9/29/22	3/28/24		Hstd
11-110	US	Wm C Peall	6	7	8	NW1/4	160	9/29/22	3/28/24		Hstd
8-354	Cal	Benj M Hartshorn	6	7	9	NE1/4	160	8/16/81	1/9/87		school scrip - Californi
3-531	Cal	R B Smith	6	7	9	S1/2 of SE1/4	80	11/28/74	12/11/74		various acts
3-499	US	Thomas East	6	7	9	N1/2 of SE1/4	80	11/15/73	10/26/74		act of 4/24/20
4-447	US	Henry Cowell	6	7	9	SW1/4	160	11/20/75	1/27/79		act of 4/24/20

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10-490	US	Albert E Finch	6	7	9	NW1/4	160	2/1/76		2/21/20	act of 4/24/20
8-354	Cal	Benj M Hartshorn	6	7	10	NW1/4	160	8/16/81		1/9/87	school scrip - Californi
3-501	US	Saml McVey	6	7	10	N1/2 of NE1/4	80	4/30/74		10/26/74	act of 4/24/20
3-531	Cal	R B Smith	6	7	10	SW1/4 of SW1/4	40	11/28/74		12/11/74	various acts
3-493	US	William McVey	6	7	10	S1/2 of SE1/4	80	5/1/74		10/26/74	school scrip-Arkansas
3-497	US	Harry W Bludworth	6	7	10	S1/2 of NE1/4	80	5/1/74		10/26/74	school scrip-Arkansas
3-497	US	Harry W Bludworth	6	7	10	N1/2 of SE1/4	80	5/1/74		10/26/74	school scrip-Arkansas
3-499	US	Thomas East	6	7	10	N1/2 of SW1/4	80	11/15/73		10/26/74	act of 4/24/20
9 59	Cal	Russell B Smith	6	7	10	SE1/4 of SW1/4	40	5/2/90		10/6/90	various acts
3-490	US	James T Silman	6	7	11	S1/2 of NW1/4	80	1/2/74		10/26/74	school scrip - Virginia
3-490	US	James T Silman	6	7	11	N1/2 of SW1/4	80	1/2/74		10/26/74	school scrip - Virginia
3-493	US	William McVey	6	7	11	S1/2 of SW1/4	80	5/1/74		10/26/74	school scrip-Arkansas
3-495	US	José M Redona	6	7	11	NE1/4	160	5/1/74		10/26/74	school scrip-Virginia
9-386	US	J D Van Ormer	6	7	11	N1/2 of NW1/4	80	11/9/91		2/28/94	act of 4/24/20
10-303	US	David J Martin	6	7	11	SE1/4	160	2/1/76		1/11/13	act of 4/24/20
2-242	US	Jesús García	6	7	12	W1/2 of NW1/4	80	11/5/70		12/28/71	various acts
3-477	Cal	Russell B Smith	6	7	12	E1/2 of NE1/4	80	11/27/72		10/28/74	various acts
3-477	Cal	Russell B Smith	6	7	12	E1/2 of SE1/4	80	11/27/72		10/28/74	various acts
1-368	US	Samuel Wilson	6	7	12	W1/2 of NE1/4	80	5/20/69		3/4/70	act of 4/24/20
1-368	US	Samuel Wilson	6	7	12	E1/2 of NW1/4	80	5/20/69		3/4/70	act of 4/24/20
1-369	US	Lydia Bowman	6	7	12	W1/2 of SE1/4	80	5/20/69		3/4/70	military bounty land
1-369	US	Lydia Bowman	6	7	12	E1/2 of SW1/4	80	5/20/69		3/4/70	military bounty land
10-307	Cal	Russell B Smith	6	7	12	SW1/4 of SW1/4	40	10/25/12		1/11/13	various acts
11 48	US	Burket F Medlin	6	7	12	NW1/4 of SW1/4	40	11/9/91		2/14/22	act of 4/24/20
3-477	Cal	Russell B Smith	6	7	13	E1/2 of NE1/4	80	11/27/72		10/28/74	various acts
3-477	Cal	Russell B Smith	6	7	13	S1/2 of SW1/4	80	11/27/72		10/28/74	various acts
3-491	US	William Doherty	6	7	13	W1/2 of NE1/4	80	5/1/74		10/26/74	school scrip-Georgia
3-491	US	William Doherty	6	7	13	E1/2 of NW1/4	80	5/1/74		10/26/74	school scrip-Georgia
2-485	US	Morris Rosenberg	6	7	13	SE1/4	160	12/20/69		11/8/72	act of 4/24/20
10-236	US	Ahrenhold D Effers	6	7	13	SW1/4 of NW1/4	40	2/1/75		12/6/09	act of 4/24/20
10-236	US	Ahrenhold D Effers	6	7	13	N1/2 of SW1/4	80	2/1/75		12/6/09	act of 4/24/20
10-307	Cal	Russell B Smith	6	7	13	NW1/4 of NW1/4	40	10/25/12		1/11/13	various acts
3-477	Cal	Russell B Smith	6	7	14	S1/2 of SE1/4	80	11/27/72		10/28/74	various acts

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3-477	Cal	Russell B Smith	6	7	14	W1/2	320	11/27/72	10/28/74		various acts
4-455	US	Charles D Elfers	6	7	14	S1/2 of NE1/4	80	3/20/75	7/1/76		act of 4/24/20
4-455	US	Charles D Elfers	6	7	14	N1/2 of SE1/4	80	3/20/75	7/1/76		act of 4/24/20
10-307	Cal	Russell B Smith	6	7	14	N1/2 of NE1/4	80	10/25/12	1/11/13		various acts
9-623	US	Benj F Wilson	6	7	15	SE1/4 of NW1/4	40	2/18/98	1/1/98		act of 4/24/20
9-623	US	Benj F Wilson	6	7	15	N1/2 of SW1/4	80	2/18/98	1/1/98		act of 4/24/20
3-531	Cal	R B Smith	6	7	15	S1/2 of SW1/4	80	11/28/74	12/11/74		various acts
3-531	Cal	R B Smith	6	7	15	E1/2	320	11/28/74	12/11/74		various acts
3-531	Cal	R B Smith	6	7	15	N1/2 of NW1/4	80	11/28/74	12/11/74		various acts
3-531	Cal	R B Smith	6	7	15	SW1/4 of NW1/4	40	11/28/74	12/11/74		various acts
3-477	Cal	Russell B Smith	6	7	16	E1/2	320	11/27/72	10/28/74		various acts
5-279	Cal	Russell B Smith	6	7	16	W1/2	320	8/1/77	1/16/78		various acts
10-216	US/Cal	Manuel Rogers	6	7	17	SW1/4 of NW1/4	40	10/4/07	10/11/07		various acts
10-216	US/Cal	Manuel Rogers	6	7	17	SW1/4 of SW1/4	40	10/4/07	10/11/07		various acts
10 36	US	Wm S McCann	6	7	17	NW1/4 of NE1/4	40	6/25/92	2/3/00		act of 4/24/20
10 1	US	James Finegan	6	7	17	E1/2 of SW1/4	80	12/5/97	6/28/98		Hstd # 2870, app 5513
10 1	US	James Finegan	6	7	17	SE1/4 of NW1/4	40	12/5/97	6/28/98		Hstd # 2870, app 5513
10 1	US	James Finegan	6	7	17	SW1/4 of NE1/4	40	12/5/97	6/28/98		Hstd # 2870, app 5513
8-120	US	Herbert A Wood	6	7	17	SW1/4 of SE1/4	40	3/1/78	4/24/85		act of 4/24/20
11-300	US	Robt Smith	6	7	17	E1/2 of E1/2	160	2/20/30	4/22/31		Hstd
11-300	US	Robt Smith	6	7	17	NW1/4 of SE1/4	40	2/20/30	4/22/31		Hstd
11-300	US	Robt Smith	6	7	17	NW1/4 of SW1/4	40	2/20/30	4/22/31		Hstd
11-300	US	Robt Smith	6	7	17	N1/2 of NW1/4	80	2/20/30	4/22/31		Hstd
10-216	US/Cal	Manuel Rogers	6	7	20	NW1/4 of SW1/4	40	10/4/07	10/11/07		various acts
9-255	US	Francisco R Evora	6	7	20	SE1/4 of NE1/4	40	6/25/92	8/6/92		act of 4/24/20
9-255	US	Francisco R Evora	6	7	20	E1/2 of SE1/4	80	6/25/92	8/6/92		act of 4/24/20
8-120	US	Herbert A Wood	6	7	20	N1/2 of NE1/4	120	3/1/78	4/24/85		act of 4/24/20
11 43	US	Jas Finegan	6	7	20	NW1/4	160	11/9/91	12/8/21		act of 4/24/20
11 94	US	Maria A Freitas	6	7	20	NE1/4 of SW1/4	40	1/31/23	10/18/23		act of 4/24/20
11 93	US	Maria A Freitas	6	7	20	SW1/4 of NE1/4	40	1/31/23	10/18/23		act of 4/24/20
9-244	US	Manuel Rogers	6	7	20	S1/2 of SW1/4	80	4/16/92	6/13/92		act of 4/24/20
9-244	US	Manuel Rogers	6	7	20	W1/2 of SE1/4	80	4/16/92	6/13/92		act of 4/24/20
8-124	US	Lafayette McKenney	6	7	21	N1/2 of NW1/4	80	5/15/77	4/24/85		act of 4/24/20

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8-126	US	Wallace B McKenney	6	7	21	NE1/4	160	6/10/75	4/24/85		act of 4/24/20
11 36	US	Antonio Caetano Freitas	6	7	21	SE1/4 of NW1/4	40	7/27/21	8/12/21		act of 4/24/20
11 35	US	Antonio Caetano Freitas	6	7	21	NE1/4 of SE1/4	40	8/1/21	8/12/21		act of 4/24/20
11 38	US	Antonio Caetano Freitas	6	7	21	SW1/4 of SE1/4	40	7/27/21	8/12/21		act of 4/24/20
9-255	US	Francisco R Evora	6	7	21	SW1/4 of NW1/4	40	6/25/92	8/6/92		act of 4/24/20
10 14	Cal	Charles Williams	6	7	21	NW1/4 of SE1/4	40	2/2/99	2/13/99		various acts
10 14	Cal	Charles Williams	6	7	21	SE1/4 of SE1/4	40	2/2/99	2/13/99		various acts
10-447	US	SPRR	6	7	21	SW1/4	160	4/20/75	3/18/19		railroad acts
10-216	US/Cal	Manuel Rogers	6	7	22	NW1/4 of NE1/4	40	10/4/07	10/11/07		various acts
8-352	Cal	Benj M Hartshorn	6	7	22	W1/2	320	11/12/68	1/9/87		school scrip - Californi
9-455	US	Laurent Siellan	6	7	22	E1/2 of NE1/4	80	5/16/92	1/17/96		act of 4/24/20
9-455	US	Laurent Siellan	6	7	22	SW1/4 of NE1/4	40	5/16/92	1/17/96		act of 4/24/20
9-455	US	Laurent Siellan	6	7	22	NE1/4 of SE1/4	40	5/16/92	1/17/96		act of 4/24/20
10-366	US/Cal	Laurent Siellan	6	7	22	NW1/4 of SE1/4	40	9/28/15	10/1/15		various acts
1-449	Cal	Benjamin Fowler	6	7	22	S1/2 of SE1/4	80	6/29/69	9/9/70		various acts
1-364	US	Russell B Smith	6	7	23	S1/2 of NE1/4	80	5/20/69	3/4/70		military bounty land
2-486	US	Moses Rosenberg	6	7	23	SE1/4	160	3/10/70	11/8/72		act of 4/24/20
3-533	Cal	Russell B Smith	6	7	23	W1/2	320	11/28/74	12/11/74		various acts
9-111	US/Cal	Chas Elfers	6	7	23	N1/2 of NE1/4	80	12/8/90			school scrip - Californi
1-449	Cal	Benjamin Fowler	6	7	23	S1/2 of S1/2	160	6/29/69	9/9/70		various acts
1-364	US	Russell B Smith	6	7	23	S1/2 of NE1/4	80	5/20/69	3/4/70		military bounty land
1-364	US	Russell B Smith	6	7	24	S1/2 of NW1/4	80	5/20/69	3/4/70		military bounty land
9-111	US/Cal	Chas Elfers	6	7	24	N1/2 of NW1/4	80	12/8/90			school scrip - Californi
1-364	US	Russell B Smith	6	7	24	S1/2 of NW1/4	80	5/20/69	3/4/70		military bounty land
3-477	Cal	Russell B Smith	6	7	24	N1/2 of SE1/4	80	11/27/72	10/28/74		various acts
3-477	Cal	Russell B Smith	6	7	24	N1/2 of SW1/4	80	11/27/72	10/28/74		various acts
1-366	US	Alexander Subs	6	7	24	NE1/4	160	5/20/69	3/14/70		act of 4/24/20

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10-408	US/Cal	D W Barrett	6	6	10		640	9/8/17	9/18/17		various acts
10-447	US	SPRR	6	6	11		640	4/20/75	3/18/19		railroad grant
10 62	US	Coleman Brashears	6	6	12	S1/2 of SW1/4	80	12/7/99	6/28/01		Hstd #3120

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10 62	US	Coleman Brashears	6	6	12	SW1/4 of SE1/4	40	12/7/99		6/28/01	Hstd #3120
10-406	US/Cal	Thos R Hart	6	6	12	N1/2 of N1/2	164	9/7/17		9/18/17	various acts
10-406	US/Cal	Thos R Hart	6	6	12	SE1/4 of NE1/4	40	9/7/17		9/18/17	various acts
9-356	US	Amos B Gridley	6	6	12	SW1/4 of NE1/4	40	1/18/92		8/19/93	act of 4/24/20
9-356	US	Amos B Gridley	6	6	12	S1/2 of NW1/4	80	1/18/92		8/19/93	act of 4/24/20
9-356	US	Amos B Gridley	6	6	12	NW1/4 of SW1/4	40	1/18/92		8/19/93	act of 4/24/20
9-358	US	Amos B Bridley	6	6	12	E1/2 of SE1/4	80	5/1/91		8/19/93	act of 4/24/20
9-358	US	Amos B Bridley	6	6	12	NW1/4 of SE1/4	40	5/1/91		8/19/93	act of 4/24/20
9-358	US	Amos B Bridley	6	6	12	NE1/4 of SW1/4	40	5/1/91		8/19/93	act of 4/24/20
10-447	US	SPRR	6	6	13		640	4/20/75		3/18/19	railroad grant
10-245	US	Henry Kaiser	6	6	14	N1/2 of NE1/4	80	9/29/10		2/21/11	Hstd #0472
10-245	US	Henry Kaiser	6	6	14	N1/2 of NW1/4	80	9/29/10		2/21/11	Hstd #0472
10 17	US	Saml A Baugess	6	6	14	NE1/4 of SW1/4	40	5/8/94		5/12/99	Hstd #2554
10 17	US	Saml A Baugess	6	6	14	N1/2 of SE1/4	80	5/8/94		5/12/99	Hstd #2554
10 17	US	Saml A Baugess	6	6	14	SE1/4 of NE1/4	40	5/8/94		5/12/99	Hstd #2554
10-149	US	Eugene W Van Deventer	6	6	14	SW1/4 of SE1/4	40	4/8/04		9/12/04	Hstd. #3364, app 6692
10-149	US	Eugene W Van Deventer	6	6	14	S1/2 of SW1/4	80	4/8/04		9/12/04	Hstd. #3364, app 6692
10-149	US	Eugene W Van Deventer	6	6	14	NW1/4 of SW1/4	40	4/8/04		9/12/04	Hstd. #3364, app 6692
11-138	US	Redmond & Braren, Inc	6	6	14	SW1/4 of NE1/4	40	9/5/22		1/26/25	act of 4/24/20
11-138	US	Redmond & Braren, Inc	6	6	14	S1/2 of NW1/4	80	9/5/22		1/26/25	act of 4/24/20
11-138	US	Redmond & Braren, Inc	6	6	14	SE1/4 of SE1/4	40	9/5/22		1/26/25	act of 4/24/20
10-447	US	SPRR	6	6	15		640	4/20/75		3/18/19	railroad grant
10-406	US/Cal	Thos R Hart	6	6	22	S1/2 of NW1/4	80	9/7/17		9/18/17	various acts
10-406	US/Cal	Thos R Hart	6	6	22	NW1/4 of SW1/4	40	9/7/17		9/18/17	various acts
10-406	US/Cal	Thos R Hart	6	6	22	E1/2 of SE1/4	80	9/7/17		9/18/17	various acts
10-406	US/Cal	Thos R Hart	6	6	22	SW1/4 of SE1/4	40	9/7/17		9/18/17	various acts
10-404	US	Eli C Latta	6	6	22	S1/2 of SW1/4	80	6/2/04		6/7/17	Hstd #3474, app 6730
10-404	US	Eli C Latta	6	6	22	NE1/4 of SW1/4	40	6/2/04		6/7/17	Hstd #3474, app 6730
10-404	US	Eli C Latta	6	6	22	NW1/4 of SE1/4	40	6/2/04		6/7/17	Hstd #3474, app 6730
11-139	US	Oluf Braren	6	6	22	N1/2 of NW1/4	80	9/29/22		1/26/25	act of 4/24/20
11 39	US	C W Clarke	6	6	22	NW1/4 of NE1/4	40	3/2/21		9/10/22	lieu of Sierra Forest Re
11 39	US	C W Clarke	6	6	22	SE1/4 of NE1/4	40	3/2/21		9/10/22	lieu of Sierra Forest Re
10-447	US	SPRR	6	6	23		640	4/20/75		3/18/19	railroad grant

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10-129	US/Cal	S P Rogers	6	6	24	NW1/4	160	10/19/03	10/30/03		various acts
9 64	US	J S Franklin	6	6	24	SW1/4	160	9/18/90	10/29/90		act of 4/24/20
8-287	US	James T Chism	6	6	24	NE1/4	160	4/20/75	9/28/86		act of 4/24/20
8-289	US	David Hays	6	6	24	SE1/4	160	2/1/75	9/28/86		act of 4/24/20
10-447	US	SPRR	6	6	25		640	4/20/75	3/18/19		railroad grant
10 25	US	Alexander Vass	6	6	26	E1/2 of SW1/4	80	5/6/96	6/23/99		Hstd #2745, app 5401
10 25	US	Alexander Vass	6	6	26	SE1/4 of NW1/4	40	5/6/96	6/23/99		Hstd #2745, app 5401
10 25	US	Alexander Vass	6	6	26	SW1/4 of NE1/4	40	5/6/96	6/23/99		Hstd #2745, app 5401
10-195	US	Geo Brown	6	6	26	E1/2 of NE1/4	80	10/25/95	9/19/06		Hstd #2688, app 5438
10-195	US	Geo Brown	6	6	26	NW1/4 of NE1/4	40	10/25/95	9/19/06		Hstd #2688, app 5438
10-195	US	Geo Brown	6	6	26	NE1/4 of NW1/4	40	10/25/95	9/19/06		Hstd #2688, app 5438
10-403	US	Marg. M. Fetterman	6	6	26	W1/2 of NW1/4	80	4/16/17	5/28/17		Hstd
10-403	US	Marg. M. Fetterman	6	6	26	W1/2 of SW1/4	80	4/16/17	5/28/17		Hstd
9-599	US	J M Choate	6	6	26	SE1/4	160	5/9/89	8/15/97		Hstd #1851, app 3554
10-447	US	SPRR	6	6	27		640	4/20/75	3/18/19		railroad grant
10-447	US	SPRR	6	6	33		640	4/20/75	3/18/19		railroad grant
11-411	US	Frank Swerer	6	6	34	E1/2 of NW1/4	80	3/8/07	11/19/43		Hstd #4307, ap 7146
11-411	US	Frank Swerer	6	6	34	E1/2 of SW1/4	80	3/8/07	11/19/43		Hstd #4307, ap 7146
11-120	US	Frank Swerer	6	6	34	SW1/4 of SW1/4	40	7/27/21	6/16/24		act of 4/24/20
11-310	US	Frank Swerer	6	6	34	NW1/4 of NW1/4	40	8/5/27	2/29/32		Hstd
10-401	US	Samuel Driver	6	6	34	SE1/4	160	2/18/90	3/22/17		Hstd #2142, ap 4016
10-413	US	Frank Swerer	6	6	34	SW1/4 of NW1/4	40	8/11/17	11/13/17		act of 4/24/20
10-413	US	Frank Swerer	6	6	34	NW1/4 of SW1/4	40	8/11/17	11/13/17		act of 4/24/20
9-479	US	Mary Whipple	6	6	34	NE1/4	160	2/23/95	4/11/96		Hstd #2625, ap 5308
10-388	US	Seward L. Humphrey	6	6	34	SE1/4 of NW1/4	40	9/7/16	10/13/16		Hstd
10-388	US	Seward L. Humphrey	6	6	34	N1/2 of SW1/4	80	9/7/16	10/13/16		Hstd
10-388	US	Seward L. Humphrey	6	6	34	SE1/4 of SW1/4	40	9/7/16	10/13/16		Hstd
10-447	US	SPRR	6	6	35		640	4/20/75	3/18/19		railroad grant
10-397	US	J H Merrall	6	6	36		640	1/22/12	1/17/17		school scrip - Californi
10-447	US	SPRR	6	7	7		991.32	4/20/75	3/18/19		railroad grant
10 11	US	Geo Burton	6	7	18	lots 3 & 4	127.77	1/18/92	12/30/98		act of 4/24/20
9-193	US	U G Sperry	6	7	18	lot 10	80	10/2/91	1/2/92		act of 4/24/20
9-193	US	U G Sperry	6	7	18	S1/2 of SE1/4	80	10/2/91	1/2/92		act of 4/24/20

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9-401	US	Frank M Frago	6 7 18	lots 5-7	143.35	4/7/94	2/15/95	act of 4/24/20
8-420	US	Harmon T Smith	6 7 18	lots 1-2	160	10/1/79	10/22/87	act of 4/24/20
8-494	US	James T Chism	6 7 18	lots 8-9	160	9/10/80	6/6/88	Hstd #848, app 2208
11-300	US	Robt Smith	6 7 18	SE1/4 of NE1/4	40	2/20/30	4/22/31	Hstd
10-447	US	SPRR	6 7 19		991.48	4/20/75	3/18/19	railroad grant
10-398	US/Cal	T E Mack	6 7 30	S1/2 lots 1, 3, 8 & 10	160	1/22/12	1/17/17	various acts
10-398	US/Cal	T E Mack	6 7 30	N1/2 lot 9	40	1/22/12	1/17/17	various acts
10-398	US/Cal	T E Mack	6 7 30	NW1/4 of NE1/4	40	1/22/12	1/17/17	various acts
10-398	US/Cal	T E Mack	6 7 30	NW1/4 of SE1/4	40	1/22/12	1/17/17	various acts
10-399	US/Cal	P J Hatton	6 7 30	E1/2 of NE1/4	80	1/22/12	1/17/17	various acts
10-399	US/Cal	P J Hatton	6 7 30	E1/2 of SE1/4	80	1/22/12	1/17/17	various acts
10 25	US	Daniel Donovan	6 7 30	lots 5-7	143.93	1/30/96	6/23/99	hstd # 2717, ap 5681
9-167	US	Geo D Brown	6 7 30	lot 2, N1/2 lot 3, lot 4	167.95	10/2/91	11/9/91	act of 4/24/20
11-137	US	Oluf Braren	6 7 30	S1/2 lot 9	40	9/29/22	1/26/25	act of 4/24/20
11-137	US	Oluf Braren	6 7 30	SW1/4 of SE1/4	40	9/29/22	1/26/25	act of 4/24/20
10-447	US	SPRR	6 7 31		991.4	4/20/75	3/18/19	railroad grant

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10-447	US	SPRR	7 6 1		640.48	4/20/75	3/18/19	railroad grant
8-492	US	Antoni Fraser	7 6 2	NE1/4	160.47	3/1/78	6/8/88	act of 4/24/20
11-376	US	Milton Swerer	7 6 2	lots 3-4	80.45	12/20/89	11/4/38	act of 4/24/20
11-376	US	Milton Swerer	7 6 2	S1/2 of NW1/4	80	12/20/89	11/4/38	act of 4/24/20
11-377	US	Milton Swerer	7 6 2	SW1/4	160	11/24/90	11/4/38	act of 4/24/20
9-199	US	James Moore	7 6 2	SE1/4	160	4/13/91	1/23/92	act of 4/24/20
10-447	US	SPRR	7 6 3	E1/2	320.44	4/20/75	3/18/19	railroad grant
9-258	US	SPRR	7 6 3	W1/2	279.19	3/21/92	8/11/92	railroad grant
11-360	US	Milton Swerer	7 6 4	S1/2 of NE1/4	80	8/24/28	5/2/36	Hstd
11-360	US	Milton Swerer	7 6 4	S1/2 of NW1/4	80	8/24/28	5/2/36	Hstd
11-360	US	Milton Swerer	7 6 4	S1/2	320	8/24/28	5/2/36	Hstd
164-493	US	Michael Mullally	7 6 4	lots 1-4	203.2	6/3/25	4/22/26	Hstd
9-258	US	SPRR	7 6 5		695.51	3/21/92	8/11/92	railroad grant
11-406	US	Bittle Hanshew	7 6 8	W1/2 of SE1/4	80	3/15/37	11/27/42	

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10-400	US	Frank D Horr	7	6	8	W1/2 of NE1/4	80	9/7/16		2/26/17	Hstd
10-400	US	Frank D Horr	7	6	8	N1/2 of SE1/4	80	9/7/16		2/26/17	Hstd
10-484	US	Milton Swerer	7	6	8	N1/2 of NW1/4	80	6/12/19		1/31/20	act of 4/24/20
11-379	US	Milton Swerer	7	6	8	E1/2 of NE1/4	80	2/12/21		11/4/38	act of 4/24/20
11-465	US	Gerber, Hurner & Draghi	7	6	8	S1/2 of NW1/4	80	3/19/64		4/6/64	
11-465	US	Gerber, Hurner & Draghi	7	6	8	SW1/4	160	3/19/64		4/6/64	
11-465	US	Gerber, Hurner & Draghi	7	6	8	SW1/4 of SE1/4	40	3/19/64		4/6/64	
9-258	US	SPRR	7	6	9		640	3/21/92		8/11/92	railroad grant
11-402	US	Frank Swerer	7	6	10	E1/2 of NE1/4	80	10/2/91		11/26/41	act of 4/24/20
11-402	US	Frank Swerer	7	6	10	E1/2 of SE1/4	80	10/2/91		11/26/41	act of 4/24/20
11-380	US	Edwin Stuart	7	6	10	W1/2 of NE1/4	80	2/13/05		11/4/38	Hstd #3562, app 6920
11-380	US	Edwin Stuart	7	6	10	lots 1 & 2	54.79	2/13/05		11/4/38	Hstd #3562, app 6920
11-378	US	Milton Swerer	7	6	10	lots 3 & 4	54.48	3/4/33		11/4/38	act of 4/24/20
11-378	US	Milton Swerer	7	6	10	NW1/4 of SE1/4	40	3/4/33		11/4/38	act of 4/24/20
11-211	US	Walter Isom	7	6	10	lots 5-8	113.79	5/18/27		10/4/27	Hstd
11-211	US	Walter Isom	7	6	10	SW1/4 of SE1/4	40	5/18/27		10/4/27	Hstd
10-447	US	SPRR	7	6	11		640	4/20/75		3/18/19	railroad grant
9-209	US	John F Snyder	7	6	12	N1/2 of SE1/4	80	8/13/89		1/23/92	act of 4/24/20
9-209	US	John F Snyder	7	6	12	S1/2 of NE1/4	80	8/13/89		1/23/92	act of 4/24/20
9-211	US	Chas B Snyder	7	6	12	N1/2 of NE1/4	80	8/13/89		1/23/92	act of 4/24/20
9-211	US	Chas B Snyder	7	6	12	N1/2 of NW1/4	80	8/13/89		1/23/92	act of 4/24/20
9-204	US	John H Weddle	7	6	12	S1/2 of SE1/4	80	10/2/91		1/23/92	act of 4/24/20
9-204	US	John H Weddle	7	6	12	S1/2 of SW1/4	80	10/2/91		1/23/92	act of 4/24/20
9-201	US	Chas B Snyder	7	6	12	S1/2 of NW1/4	80	10/10/89		1/23/92	act of 4/24/20
9-201	US	Chas B Snyder	7	6	12	N1/2 of SW1/4	80	10/10/89		1/23/92	act of 4/24/20
10-447	US	SPRR	7	6	13		640	4/20/75		3/18/19	railroad grant
9-188	US	James W Hudelson	7	6	14	NE1/4	160	11/4/90		12/22/91	act of 4/24/20
9-187	US	J M Newsom	7	6	14	SE1/4	160	4/16/90		12/22/91	act of 4/24/20
9-190	US	James W Hudelson	7	6	14	SW1/4	160	2/25/91		12/22/91	act of 4/24/20
9-433	US	John R Hudelson	7	6	14	NW1/4	160	4/11/92		6/19/95	act of 4/24/20
10-447	US	SPRR	7	6	15	NE1/4	160	4/20/75		3/18/19	railroad grant
9-258	US	SPRR	7	6	15	NW1/4 & S1/2	404.74	3/21/92		8/11/92	railroad grant
10-253	US/Cal	Thos E Price	7	6	16	NE1/4 of SE1/4	40	12/2/11		12/6/11	various acts

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10-253	US/Cal	Thos E Price	7 6 16	E1/2 of NE1/4	80	12/2/11	12/6/11		various acts
10-253	US/Cal	Thos E Price	7 6 16	NW1/4 of NE1/4	40	12/2/11	12/6/11		various acts
10-253	US/Cal	Thos E Price	7 6 16	NE1/4 of NW1/4	40	12/2/11	12/6/11		various acts
11-294	Cal	Wm H Isom	7 6 16	W1/2 of NW1/4	80	2/17/31	3/5/31		various acts
11-294	Cal	Wm H Isom	7 6 16	SE1/4 of NW1/4	40	2/17/31	3/5/31		various acts
11-294	Cal	Wm H Isom	7 6 16	N1/2 of SW1/4	80	2/17/31	3/5/31		various acts
11-294	Cal	Wm H Isom	7 6 16	SW1/4 of NE1/4	40	2/17/31	3/5/31		various acts
11-294	Cal	Wm H Isom	7 6 16	NW1/4 of SE1/4	40	2/17/31	3/5/31		various acts
11-451	Cal	Walter L Isom	7 6 16	S1/2 of S1/2	160	6/24/59	8/14/59		various acts
9-258	US	SPRR	7 6 17		640	3/21/92	8/11/92		railroad grant
9-258	US	SPRR	7 6 21		640	3/21/92	8/11/92		railroad grant
10-402	US	Alexander W Hearne	7 6 22	lots 1, 2, 8 & 9	159.13	7/20/16	4/9/17		act of 4/24/20
10-479	US	Walter Lee Isom	7 6 22	lots 3, 6-7	114.53	8/18/19	11/10/19		Hstd
10-479	US	Walter Lee Isom	7 6 22	10-11, 14-16	206.9	8/18/19	11/10/19		Hstd
11-225	US	Walter Lee Isom	7 6 22	lots 4-5, 12-13	151.39	9/6/23	1/24/28		Hstd
9-258	US	SPRR	7 6 23		713.32	3/21/92	8/11/92		railroad grant
9-203	US	Jos A Allen	7 6 24	NW1/4	166.93	10/2/91	1/23/92		act of 4/24/20
11-427	US	Geo F & Grace A Covell	7 6 24	lots 7-10	163.92	2/11/49	12/1/49		act of 4/24/20
9-258	US	SPRR	7 6 25		612.19	3/21/92	8/11/92		railroad grant
10 39	US/Cal	John W Sharp	7 6 26	NW1/4 of NW1/4	40	3/3/00	4/21/00		various acts
9 46	US	John W Sharp	7 6 26	W1/2 of NE1/4	80	6/27/90	8/19/90		Hstd #1957, app 3724
9 46	US	John W Sharp	7 6 26	W1/2 of SE1/4	80	6/27/90	8/19/90		Hstd #1957, app 3724
9-431	US	John M Newsom	7 6 26	SE1/4 of SE1/4	40	1/18/92	5/13/95		act of 4/24/20
8-396	US	John W Sharp	7 6 26	E1/2 of NW1/4	80	4/28/87	9/7/87		act of 4/24/20
11 61	US	John W Sharp	7 6 26	E1/2 of NE1/4	80	6/16/22	8/5/22		Hstd
11 61	US	John W Sharp	7 6 26	NE1/4 of SE1/4	40	6/16/22	8/5/22		Hstd
11 61	US	John W Sharp	7 6 26	SW1/4 of SW1/4	40	6/16/22	8/5/22		Hstd
11 61	US	John W Sharp	7 6 26	NW1/4	160	6/16/22	8/5/22		Hstd
9-258	US	SPRR	7 6 27		640	3/21/92	8/11/92		railroad grant
9-258	US	SPRR	7 6 35		640	3/21/92	8/11/92		railroad grant
10-194	US/Cal	John W Sharp	7 6 36		640	8/19/06	8/26/06		various acts
10-447	US	SPRR	7 7 5		643.52	4/20/75	3/18/19		Hstd
11-230	US	Glenn Hornbeck	7 7 6	lots 6-8, 18	123.62				Hstd

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8-152	Cal	C L Weller	7	7	6	lots 7-10, 14	215.82	6/12/85	8/20/85		various acts
8-152	Cal	C L Weller	7	7	6	N1/2 lots 11-13	120	6/12/85	8/20/85		various acts
9-205	US	William Cummins	7	7	6	lots 3-6	169.85	11/24/90	1/23/92		act of 4/24/20
9-207	US	Peter Dahl	7	7	6	S1/2 lots 11-13, lot 15	168.07	2/25/91	1/23/92		act of 4/24/20
9-208	US	James Peterson	7	7	6	SE1/4	160	2/25/91	1/23/92		act of 4/24/20
9-214	US	Thomas Dragoo	7	7	6	lots 1-2, S1/2 of NE1/4	161.88	2/25/91	1/23/92		act of 4/24/20
10-447	US	SPRR	7	7	7		992.52	4/20/75	3/18/19		railroad grant
10-100	US	Clinton W South	7	7	8	S1/2 of SW1/4	80	12/9/02	2/19/03		act of 4/24/20
10-100	US	Clinton W South	7	7	8	S1/2 of SE1/4	80	12/9/02	2/19/03		act of 4/24/20
10-128	US	Luis Eriksen	7	7	8	NE1/4	160	12/27/98	10/12/03		Hstd #3022, app 6032
10-248	US	Lucy P South	7	7	8	N1/2 of SE1/4	80	6/27/04	1/21/11		act of 4/24/20
10-248	US	Lucy P South	7	7	8	N1/2 of SW1/4	80	6/27/04	1/21/11		act of 4/24/20
9 55	US	Carsten Jensen	7	7	8	NW1/4	160	10/14/89	9/19/90		act of 4/24/20
10-447	US	SPRR	7	7	9		640	4/20/75	3/18/19		railroad grant
10-447	US	SPRR	7	7	17		640	4/20/75	3/18/19		railroad grant
9-331	US	Albert L Thomsen	7	7	18	S1/2 lot 3, lots 5-6	176.1	2/25/91	4/10/93		act of 4/24/20
9-331	US	Albert L Thomsen	7	7	18	N1/2 lot 8	40	2/25/91	4/10/93		act of 4/24/20
9-373	US	Albert L Thomsen	7	7	18	lot 2, N1/2 lot 3, lot 4	176.1	2/25/91	4/10/93		act of 4/24/20
11-413	US	Andreas Sulter	7	7	18	W1/2 of NE1/4, lot 1	160	10/19/05	2/13/45		Hstd #3618, app 7004
11-365	US	Heirs of Ralph Stanley	7	7	18	E1/2 of NE1/4	80	8/15/34	10/17/36		Hstd
11-365	US	Heirs of Ralph Stanley	7	7	18	SE1/4 & lot 10	240	8/15/34	10/17/36		Hstd
10 60	US	Lorenz H Lorensen	7	7	18	lot 7, S1/2 of lot 8, lot 9	167.98	3/23/01	6/22/01		Hstd #3193, app 5845
10-447	US	SPRR	7	7	19		991.72	4/20/75	3/18/19		railroad grant
9-212	US	Jennie Wilson	7	7	20	S1/2 of SE1/4	80	6/3/91	1/23/92		act of 4/24/20
9-212	US	Jennie Wilson	7	7	20	S1/2 of SW1/4	80	6/3/91	1/23/92		act of 4/24/20
11-230	US	Glenn Hornbeck	7	7	20	S1/2 of NE1/4	80				Hstd
11-230	US	Glenn Hornbeck	7	7	20	S1/2 of NW1/4	80				Hstd
11-230	US	Glenn Hornbeck	7	7	20	N1/2 of N1/2	160				Hstd
11-230	US	Glenn Hornbeck	7	7	20	N1/2 of S1/2	160				Hstd
10-447	US	SPRR	7	7	29		640	4/20/75	3/18/19		railroad grant
9-217	US	Elisha H Robison	7	7	30	lot 3	80	4/13/91	1/23/92		act of 4/24/20
9-200	US	Charles E Wilcox	7	7	30	E1/2 of NE1/4	80	12/31/90	1/23/92		Hstd #1958, app 4422
9-200	US	Charles E Wilcox	7	7	30	E1/2 of SE1/4	80	12/31/90	1/23/92		Hstd #1958, app 4422

<u>Ref #</u>	<u>Grantor</u>	<u>Grantee</u>	<u>T</u>	<u>R</u>	<u>Sec</u>	<u>Fraction</u>	<u>Acres</u>	<u>Instr</u>	<u>Date</u>	<u>Rec</u>	<u>Date</u>	<u>Basis of Grant</u>
9-398	US	John D Yates	7	7	30	lot 2	80	4/27/89	9/19/94	act of	4/24/20	
11-115	US	Jos Washington Dutra	7	7	30	NE1/4	160	4/13/23	5/27/24	Hstd		
11-115	US	Jos Washington Dutra	7	7	30	lots 1, 4-12, 14-15	472.08	4/13/23	5/27/24	Hstd		
11-429	US	Grace A Covell	7	7	30	lot 13	41.11	4/27/50	8/15/50	act of	4/24/20	
10-447	US	SPRR	7	7	31	E1/2 of NE1/4	80	4/20/75	3/18/19	railroad grant		
10-447	US	SPRR	7	7	31	S1/2	495.6	4/20/75	3/18/19	railroad grant		
11-264	US	Manuel Correo	7	7	31	lots 6-12, 14-15	404.17	10/16/28	8/29/29	Hstd		
9 28	US	Augustus E Smith	7	7	32	SW1/4 of NW1/4	40	12/20/89	4/28/90	act of	4/24/20	
9 28	US	Augustus E Smith	7	7	32	SE1/4 of NW1/4	40	12/20/89	4/28/90	act of	4/24/20	
9 28	US	Augustus E Smith	7	7	32	W1/2 of SE1/4	80	12/20/89	4/28/90	act of	4/24/20	
9-565	US	John M Newsom	7	7	32	SW1/4 of NW1/4	40	11/3/92	11/11/96	act of	4/24/20	
9-565	US	John M Newsom	7	7	32	NW1/4 of SW1/4	40	11/3/92	11/11/96	act of	4/24/20	
9-565	US	John M Newsom	7	7	32	E1/2 of SW1/4	80	11/3/92	11/11/96	act of	4/24/20	
8-317	US	Geo W Demint	7	7	32	N1/2 of NE1/4	80	6/12/85	1/8/87	act of	4/24/20	
8-317	US	Geo W Demint	7	7	32	N1/2 of NW1/4	80	6/12/85	1/8/87	act of	4/24/20	
11-382	US	Ervin O Miller	7	7	32	SE1/4 of NE1/4	40	1/1/39	2/29/39	Hstd		
11-382	US	Ervin O Miller	7	7	32	E1/2 of SE1/4	80	1/1/39	2/29/39	Hstd		
11-426	US	Simon Newman Co	7	7	32	SW1/4 of SW1/4	40	4/12/49	5/13/49	act of	4/24/20	

## Appendix II. Transfer of Property to Large Holders in the Study Area.

### Access Road Area

#### 1. Russell B. Smith

<u>Ref. #</u>	<u>Grantor</u>	<u>Grantee</u>	<u>T S R E Sec Fraction</u>			<u>Acres</u>	<u>Inst Date</u>	<u>Rec Date</u>
3-477	Cal	Russell B Smith	5	7	36	640	11/27/72	10/28/74
4-216	Augustus Bronson	Russell B Smith	6	7	1 S1/2 of NE1/4	80	11/18/67	11/21/67
4-216	Augustus Bronson	Russell B Smith	6	7	1 S1/2 of NW1/4	80	11/18/67	11/21/67
4-351	Morris Rosenberg	Russell B Smith	6	7	1 W1/2 of SE1/4	80	5/11/68	5/12/68
4-351	Morris Rosenberg	Russell B Smith	6	7	1 E1/2 of SW1/4	80	5/11/68	5/12/68
7-129	Augustus Bronson	Russell B Smith	6	7	1 S1/2 of NE1/4	80	1/5/70	
7-129	Augustus Bronson	Russell B Smith	6	7	1 S1/2 of NW1/4	80	1/5/70	
2-242	US	Jesús Garcia	6	7	1 W1/2 of SW1/4	80	11/5/70	12/28/71
8-207	Jesus Garcia	Russell B Smith	6	7	1 W1/2 of SW1/4	80	12/27/71	12/28/71
7-170	Morris Rosenberg	Russell B Smith	6	7	1 W1/2 of SE1/4	80	xx/27/71	1/31/71
7-170	Morris Rosenberg	Russell B Smith	6	7	1 E1/2 of SW1/4	80	xx/27/71	1/31/71
52-118	Superior Court	Maria L Smith	6	7	1	640	6/5/93	6/24/93
3-477	Cal	Russell B Smith	6	7	1 E1/2 of SE1/4	80	11/27/72	10/28/74
3-536	Cal	Russell B Smith	6	7	1 frac N1/2 of NW1/4	79.2	11/28/74	12/11/74
3-536	Cal	Russell B Smith	6	7	1 frac N1/2 of NE1/4	79.2	11/28/74	12/11/74
12 63	Russell B Smith	Frank McCaffrey	6	7	2 NW1/4	160	2/7/74	2/12/74
12 63	Frank McCaffrey	Russell B Smith	6	7	2 S1/2 of SE1/4	80	2/7/74	2/12/74
12 63	Frank McCaffrey	Russell B Smith	6	7	2 S1/2 of SW1/4	80	2/7/74	2/12/74
12-436	Russell B Smith	Frank McCaffrey	6	7	2 NW1/4	160	6/6/74	6/24/74
12-431	Frank McCaffrey	Russell B Smith	6	7	2 S1/2 of SE1/4	80	6/22/74	6/24/74
12-431	Frank McCaffrey	Russell B Smith	6	7	2 S1/2 of SW1/4	80	6/22/74	6/24/74
52-118	Superior Court	Maria L Smith	6	7	2 E1/2, SW1/4	480	6/5/93	6/24/93
3-477	Cal	Russell B Smith	6	7	2 S1/2 of NW1/4	80	11/27/72	10/28/74
3-477	Cal	Russell B Smith	6	7	2 S1/2 of NE1/4	80	11/27/72	10/28/74
3-477	Cal	Russell B Smith	6	7	2 N1/2 of SW1/4	80	11/27/72	10/28/74
3-536	Cal	Russell B Smith	6	7	2 frac N1/2 of NW1/4	79.2	11/28/74	12/11/74

<u>Ref. #</u>	<u>Grantor</u>	<u>Grantee</u>	<u>T S R E Sec Fraction</u>				<u>Acres</u>	<u>Inst Date</u>	<u>Rec Date</u>
3-536	Cal	Russell B Smith	6	7	2	frac N1/2 of NE1/4	79.2	11/28/74	12/11/74
11-450	Samuel McVey	Russell B Smith	6	7	3	S1/2 of SE1/4	160	11/27/73	11/29/73
52-118	Superior Court	Maria L Smith	6	7	3	S1/2 of SE1/4	80	6/5/93	6/24/93
3-499	US	Thomas East	6	7	9	N1/2 of SE1/4	80	11/15/73	10/26/74
10-199	Thomas East	Russell B Smith	6	7	9	N1/2 of SE1/4	160	3/7/73	3/10/73
10-490	US	Albert E Finch	6	7	9	NW1/4	160	2/1/76	2/21/20
14-214	William McVey	Russell B Smith	6	7	9	NW1/4	160	8/17/75	8/19/75
52-118	Superior Court	Maria L Smith	6	7	9	S1/2, NW1/4	480	6/5/93	6/24/93
3-531	Cal	Russell B Smith	6	7	9	S1/2 of SE1/4	80	11/28/74	12/11/74
4-447	US	Henry Cowell	6	7	9	SW1/4	160	11/20/75	1/27/79
		Russell B Smith	6	7	9	SW1/4	160		
3-499	US	Thomas East	6	7	10	N1/2 of SW1/4	80	11/15/73	10/26/74
10-199	Thomas East	Russell B Smith	6	7	10	N1/2 of SW1/4	80	3/7/73	3/10/73
3-497	US	Harry W Bludworth	6	7	10	S1/2 of NE1/4	80	5/1/74	10/26/74
3-497	US	Harry W Bludworth	6	7	10	N1/2 of SE1/4	80	5/1/74	10/26/74
10-287	N W Bludworth	Russell B Smith	6	7	10	S1/2 of NE1/4	80	4/4/73	4/12/73
10-287	N W Bludworth	Russell B Smith	6	7	10	N1/2 of SE1/4	80	4/4/73	4/12/73
3-493	US	William McVey	6	7	10	S1/2 of SE1/4	80	5/1/74	10/26/74
10-438	William McVey	Russell B Smith	6	7	10	S1/2 of SE1/4	80	5/16/73	5/17/73
3-501	US	Samuel McVey	6	7	10	N1/2 of NE1/4	80	4/30/74	10/26/74
11-450	Samuel McVey	Russell B Smith	6	7	10	N1/2 of NE1/4	80	11/27/73	11/29/73
52-118	Superior Court	Maria L Smith	6	7	10	E1/2, SW1/4	480	6/5/93	6/24/93
9 59	Cal	Russell B Smith	6	7	10	SE1/4 of SW1/4	40	5/2/90	10/6/90
3-531	Cal	Russell B Smith	6	7	10	SW1/4 of SW1/4	40	11/28/74	12/11/74
3-493	US	William McVey	6	7	11	S1/2 of SW1/4	80	5/1/74	10/26/74
10-438	William McVey	Russell B Smith	6	7	11	S1/2 of SW1/4	80	5/16/73	5/17/73
3-495	US	José M Redona	6	7	11	NE1/4	160	5/1/74	10/26/74
10-440	José M Redona	Russell B Smith	6	7	11	NE1/4	160	5/19/73	5/21/73
3-490	US	James T Silman	6	7	11	S1/2 of NW1/4	80	1/2/74	10/26/74
3-490	US	James T Silman	6	7	11	N1/2 of SW1/4	80	1/2/74	10/26/74
10-576	James T Silman	Russell B Smith	6	7	11	S1/2 of NW1/4	80	10/17/73	10/23/73
10-576	James T Silman	Russell B Smith	6	7	11	N1/2 of SW1/4	80	10/17/73	10/23/73

<u>Ref. #</u>	<u>Grantor</u>	<u>Grantee</u>	<u>T</u>	<u>S</u>	<u>R</u>	<u>E</u>	<u>Sec</u>	<u>Fraction</u>	<u>Acres</u>	<u>Inst Date</u>	<u>Rec Date</u>
10-303	US	David J Martin	6	7	11			SE1/4	160	2/1/76	1/11/13
14-294	D J Martin	Russell B Smith	6	7	11			SE1/4	160	9/7/75	9/9/75
52-118	Superior Court	Maria L Smith	6	7	11			E1/2, SW1/4	480	6/5/93	6/24/93
52-118	Superior Court	Maria L Smith	6	7	11			S1/2 of N1/4	80	6/5/93	6/24/93
1-368	US	Samuel Wilson	6	7	12			W1/2 of NE1/4	80	5/20/69	3/4/70
1-368	US	Samuel Wilson	6	7	12			E1/2 of NW1/4	80	5/20/69	3/4/70
4-267	Samuel Wilson	Russell B Smith	6	7	12			W1/2 of NE1/4	80	2/4/68	2/27/68
4-267	Samuel Wilson	Russell B Smith	6	7	12			E1/2 of NW1/4	80	2/4/68	2/27/68
1-369	US	Lydia Bowman	6	7	12			W1/2 of SE1/4	80	5/20/69	3/4/70
1-369	US	Lydia Bowman	6	7	12			E1/2 of SW1/4	80	5/20/69	3/4/70
4-268	Augustus Bronson	Russell B Smith	6	7	12			W1/2 of SE1/4	80	2/24/68	2/27/68
4-268	Augustus Bronson	Russell B Smith	6	7	12			E1/2 of SW1/4	80	2/24/68	2/27/68
7-129	Augustus Bronson	Russell B Smith	6	7	12			W1/2 of SE1/4	80	1/5/70	
7-129	Augustus Bronson	Russell B Smith	6	7	12			E1/2 of SW1/4	80	1/5/70	
2-242	US	Jesus Garcia	6	7	12			W1/2 of NW1/4	80	11/5/70	12/28/71
6-195	Jesus Garcia	Russell B Smith	6	7	12			W1/2 of NW1/4	80	4/4/70	4/5/70
7-123	Samuel Wilson	Russell B Smith	6	7	12			W1/2 of NE1/4	80	1/5/71	1/13/71
7-123	Samuel Wilson	Russell B Smith	6	7	12			E1/2 of NW1/4	80	1/5/71	1/13/71
8-207	Jesus Garcia	Russell B Smith	6	7	12			W1/2 of NW1/4	80	12/27/71	12/28/71
52-118	Superior Court	Maria L Smith	6	7	12			E1/2, NW1/4	480	6/5/93	6/24/93
52-118	Superior Court	Maria L Smith	6	7	12			S1/2, NW1/4 of SW1/4	360	6/5/93	6/24/93
3-477	Cal	Russell B Smith	6	7	12			E1/2 of NE1/4	80	11/27/72	10/28/74
3-477	Cal	Russell B Smith	6	7	12			E1/2 of SE1/4	80	11/27/72	10/28/74
10-307	Cal	Russell B Smith	6	7	12			SW1/4 of SW1/4	40	10/25/12	1/11/13
2-485	US	Morris Rosenberg	6	7	13			SE1/4	160	12/20/69	11/8/72
7-170	Morris Rosenberg	Russell B Smith	6	7	13			SE1/4	160	xx/27/71	1/31/71
3-491	US	William Doherty	6	7	13			W1/2 of NE1/4	80	5/1/74	10/26/74
3-491	US	William Doherty	6	7	13			E1/2 of NW1/4	80	5/1/74	10/26/74
12 95	William Doherty	R B Smith	6	7	13			W1/2 of NE1/4	80	2/4/74	
12 95	William Doherty	R B Smith	6	7	13			E1/2 of NW1/4	80	2/4/74	
52-118	Superior Court	Maria L Smith	6	7	13			E1/2, S1/2 of SW1/4	400	6/5/93	6/24/93
52-118	Superior Court	Maria L Smith	6	7	13			N1/2, SE1/4 of NW1/4	360	6/5/93	6/24/93

<u>Ref. #</u>	<u>Grantor</u>	<u>Grantee</u>	<u>T</u>	<u>S</u>	<u>R</u>	<u>E</u>	<u>Sec</u>	<u>Fraction</u>	<u>Acres</u>	<u>Inst Date</u>	<u>Rec Date</u>
3-477	Cal	Russell B Smith	6	7	13			E1/2 of NE1/4	80	11/27/72	10/28/74
3-477	Cal	Russell B Smith	6	7	13			S1/2 of SW1/4	80	11/27/72	10/28/74
10-307	Cal	Russell B Smith	6	7	13			NW1/4 of NW1/4	40	10/25/12	1/11/13
52-118	Superior Court	Maria L Smith	6	7	14			W1/2, N1/2 of NE1/4	400	6/5/93	6/24/93
52-118	Superior Court	Maria L Smith	6	7	14			S1/2 of SE1/4	80	6/5/93	6/24/93
3-477	Cal	Russell B Smith	6	7	14			S1/2 of SE1/4	80	11/27/72	10/28/74
3-477	Cal	Russell B Smith	6	7	14			W1/2	320	11/27/72	10/28/74
10-307	Cal	Russell B Smith	6	7	14			N1/2 of NE1/4	80	10/25/12	1/11/13
52-118	Superior Court	Maria L Smith	6	7	15			E1/2, S1/2 of SW1/4	400	6/5/93	6/24/93
52-118	Superior Court	Maria L Smith	6	7	15			SE1/4 of NW1/4	40	1895 map	
52-118	Superior Court	Maria L Smith	6	7	15			N1/2 of SW1/4	80	1895 map	
3-531	Cal	Russell B Smith	6	7	15			S1/2 of SW1/4	80	11/28/74	12/11/74
3-531	Cal	Russell B Smith	6	7	15			E1/2, N1/2 of NW1/4	400	11/28/74	12/11/74
3-531	Cal	Russell B Smith	6	7	15			SW1/4 of NW1/4	40	11/28/74	12/11/74
52-118	Superior Court	Maria L Smith	6	7	16			W1/2, NE1/4 of NW1/4	360	6/5/93	6/24/93
3-477	Cal	Russell B Smith	6	7	16			E1/2	320	11/27/72	10/28/74
5-279	Cal	Russell B Smith	6	7	16			W1/2	320	8/1/77	1/16/78
52-118	Superior Court	Maria L Smith	6	7	19			W1/2 of SW1/4	80	6/5/93	6/24/93
52-118	Superior Court	Maria L Smith	6	7	19			SW1/4 of NW1/4	40	6/5/93	6/24/93
5-305	Moses Rosenberg	Russell B Smith	6	7	23			SE1/4	160	5/28/69	5/29/69
7-125	Moses Rosenberg	Russell B Smith	6	7	23			SE1/4	160	1/4/71	1/13/71
52-118	Superior Court	Maria L Smith	6	7	23			W1/2, SE1/4	480	6/5/93	6/24/93
52-118	Superior Court	Maria L Smith	6	7	23			S1/2 of NE1/4	80	6/5/93	6/24/93
1-364	US	Russell B Smith	6	7	23			S1/2 of NE1/4	80	5/20/69	3/4/70
3-533	Cal	Russell B Smith	6	7	23			W1/2	320	11/28/74	12/11/74
7-118	Alexander Lubs	Russell B Smith	6	7	24			NE1/4	160	12/29/70	1/13/[71]
52-118	Superior Court	Maria L Smith	6	7	24			N1/2 of S1/2	160	6/5/93	6/24/93
52-118	Superior Court	Maria L Smith	6	7	24			NE1/4, S1/2 of NW1/4	240	6/5/93	6/24/93
3-477	Cal	Russell B Smith	6	7	24			N1/2 of SE1/4	80	11/27/72	10/28/74
3-477	Cal	Russell B Smith	6	7	24			N1/2 of SW1/4	80	11/27/72	10/28/74
1-364	US	Russell B Smith	6	7	24			S1/2 of NW1/4	80	5/20/69	3/4/70

2. John W. Jones

<u>Ref. #</u>	<u>Grantor</u>	<u>Grantee</u>	<u>T S R E Sec Fraction</u>				<u>Acres</u>	<u>Inst Date</u>	<u>Rec Date</u>
52-278		Jones Estate	5	7	26	SW1/4	40	1/4/94	3/20/97
52-278		Jones Estate	5	7	26	S1/2 & NE1/4 of NW1/4	120	1/4/94	3/20/97
52-278		Jones Estate	5	7	27	S1/2, S1/2 of NE1/4	400	1/4/94	3/20/97
21-76	David Dutton	John W Jones	5	7	27	S1/2, S1/2 of NE1/4	240	10/1/81	10/3/81
52-278		Jones Estate	5	7	28	E1/2 of SE1/4	80	1/4/94	3/20/97
21-76	David Dutton	John W Jones	5	7	28	E1/2 of SE1/4	80	10/1/81	10/3/81
24-194	A S Fulkerth	John W Jones	5	7	28	SW1/4 of NW1/4	40	7/20/82	1/12/83
24-194	A S Fulkerth	John W Jones	5	7	28	W1/2 of SW1/4	80	7/20/82	1/12/83
24-194	A S Fulkerth	John W Jones	5	7	28	E1/2 of W1/2	160	7/20/82	1/12/83
52-278		Jones Estate	5	7	29	S1/2 of NE1/4	40	1/4/94	3/20/97
52-278		Jones Estate	5	7	29	N1/2 of SE1/4	40	1/4/94	3/20/97
52-278		Jones Estate	5	7	29	SW1/4 of SE1/4	40	1/4/94	3/20/97
24-194	A S Fulkerth	John W Jones	5	7	29	S1/2 of NE1/4	80	7/20/82	1/12/83
24-194	A S Fulkerth	John W Jones	5	7	29	NW1/4 of SE1/4	40	7/20/82	1/12/83
24-194	A S Fulkerth	John W Jones	5	7	29	SE1/4 of NE1/4	40	7/20/82	1/12/83
52-278		Jones Estate	5	7	32	S1/2 of NE1/4	80	1/4/94	3/20/97
52-278		Jones Estate	5	7	32	NW1/4 of NE1/4	40	1/4/94	3/20/97
21-76	David Dutton	John W Jones	5	7	32	NW1/4 of NE1/4	40	10/1/81	10/3/81
21-76	David Dutton	John W Jones	5	7	32	S1/2 of NE1/4	80	10/1/81	10/3/81
21-76	David Dutton	John W Jones	5	7	32	SW1/4 of SE1/4	40	10/1/81	10/3/81
9-558	US	William Erwin	5	7	33	S1/2 of SE1/4	80	12/15/75	10/22/96
9-558	US	William Erwin	5	7	33	NE1/4 of SE1/4	40	12/15/75	10/22/96
9-549	US	Curtis N Hunt	5	7	33	S1/2 of NE1/4	80	2/1/95	10/22/96
9-549	US	Curtis N Hunt	5	7	33	E1/2 of NW1/4	80	2/1/95	10/22/96
9-550	US	Curtis N Hunt	5	7	33	N1/2 of NE1/4	80	2/1/95	10/22/96
52-278		Jones Estate	5	7	33	E1/2 of NW1/4	80	1/4/94	3/20/97
52-278		Jones Estate	5	7	33	SE1/4 of SW1/4	40	1/4/94	3/20/97
52-278		Jones Estate	5	7	33	E1/2	320	1/4/94	3/20/97
21-76	David Dutton	John W Jones	5	7	33	E1/2 of NW1/4	80	10/1/81	10/3/81
21-76	David Dutton	John W Jones	5	7	33	SW1/4 of SE1/4	40	10/1/81	10/3/81
21-76	David Dutton	John W Jones	5	7	33	NE1/4, E1/2 of SE1/4	240	10/1/81	10/3/81

<u>Ref. #</u>	<u>Grantor</u>	<u>Grantee</u>	<u>T S R E Sec Fraction</u>				<u>Acres</u>	<u>Inst Date</u>	<u>Rec Date</u>
21-76	David Dutton	John W Jones	5	7	33	SE1/4 of SW1/4	40	10/1/81	10/3/81
21-76	David Dutton	John W Jones	5	7	33	NW1/4 of SE1/4	40	10/1/81	10/3/81
9-558	US	William Erwin	5	7	34	SW1/4 of SW1/4	40	12/15/75	10/22/96
9-550	US	Curtis N Hunt	5	7	34	W1/2 of NW1/4	80	2/1/95	10/22/96
9-554	US	John D Cox	5	7	34	E1/2 of NW1/4	80	9/10/75	10/22/96
9-554	US	John D Cox	5	7	34	E1/2 of SW1/4	80	9/10/75	10/22/96
4-125	US	Andrews Willows	5	7	34	NE1/4	160	1/2/74	8/5/75
52-278		Jones Estate	5	7	34	N1/2, E1/2 of SW1/4	400	1/4/94	3/20/97
52-278		Jones Estate	5	7	34	SW1/4 of SE1/4	40	1/4/94	3/20/97
		John W Jones	5	7	34	W1/2	320	1895 map	
21-76	David Dutton	John W Jones	5	7	34	NE1/4 of SW1/4	40	10/1/81	10/3/81
21-76	David Dutton	John W Jones	5	7	34	N1/2, S1/2 of SW1/4	240	10/1/81	10/3/81
2-572	US	James Willows	5	7	35	NW1/4	160	1/5/72	3/24/73
3-405	US	Thomas H Clayton	5	7	35	SW1/4	160	1/5/72	8/14/74
52-278		Jones Estate	5	7	35	W1/2	320	1/4/94	3/20/97
21-76	David Dutton	John W Jones	5	7	35	W1/2	320	10/1/81	10/3/81
9-552	US	Thos H Clayton	6	7	3	NE1/4	158.85	2/1/75	10/22/96
		John W Jones	6	7	3	NE1/4	160	1895 map	
21-76	David Dutton	John W Jones	6	7	3	NE1/4	160	10/1/81	10/3/81
9-557	US	Geo W Finch	6	7	4	NW1/4	166.2	2/1/76	10/22/96
		John W Jones	6	7	4	NW1/4	160	1895 map	
21-76	David Dutton	John W Jones	6	7	4	NW1/4	160	10/1/81	10/3/81

### 3. Manuel Rogers

<u>Ref</u>	<u>Grantor</u>	<u>Grantee</u>	<u>T E R E Sec Fraction</u>				<u>Acres</u>	<u>Inst Date</u>	<u>Rec Date</u>
8-354	Cal	Benj M Hartshorn	6	7	3	SW1/4	160	8/16/81	1/9/87
47-91	Hartshorne, Claytons	Manuel Rogers	6	7	3	SW1/4	1600	6/17/90	6/23/90
8-352	Cal	Benj M Hartshorn	6	7	4	E1/2	320	11/12/68	1/9/87
47-91	Hartshorne, Claytons	Manuel Rogers	6	7	4	E1/2	320	6/17/90	6/23/90
8-122	US	Wallace B McKenney	6	7	8	N1/2 of SE1/4	80	3/1/78	4/24/85
8-122	US	Wallace B McKenney	6	7	8	N1/2 of SW1/4	80	3/1/78	4/24/85

<u>Ref. #</u>	<u>Grantor</u>	<u>Grantee</u>	<u>T S R E Sec Fraction</u>				<u>Acres</u>	<u>Inst Date</u>	<u>Rec Date</u>
51-149	DeWitt McKenney	Frank P Pray	6	7	8	N1/2 of S1/2	160	9/18/90	2/12/92
49-492	L M McKenney et ux	Frank P Pray	6	7	8	N1/2 of S1/2	160	10/2/92	2/12/92
49-497	Irene A McKenney et al	Frank P Pray	6	7	8	N1/2 of S1/2	160	10/2/92	2/12/92
51-153	Arthur C McKenney et al	Frank P Pray	6	7	8	N1/2 of S1/2	160	10/2/92	2/12/92
51-217	F P & Mabel Pray	Manuel Rogers	6	7	8	N1/2 of S1/2	520	2/8/92	3/16/92
10-216	US/Cal	Manuel Rogers	6	7	8	SE1/4 of NE1/4	40	10/4/07	10/11/07
10-216	US/Cal	Manuel Rogers	6	7	8	N1/2 of NE1/4	80	10/4/07	10/11/07
10-216	US/Cal	Manuel Rogers	6	7	8	SW1/4 of NE1/4	40	10/4/07	10/11/07
10-216	US/Cal	Manuel Rogers	6	7	8	N1/2 of SE1/4	40	10/4/07	10/11/07
8-354	Cal	Benj M Hartshorn	6	7	9	NE1/4	160	8/16/81	1/9/87
47-91	Hartshorne, Claytons	Manuel Rogers	6	7	9	NE1/4	160	6/17/90	6/23/90
8-354	Cal	Benj M Hartshorn	6	7	10	NW1/4	160	8/16/81	1/9/87
47-91	Hartshorne, Claytons	Manuel Rogers	6	7	10	NW1/4	160	6/17/90	6/23/90
8-120	US	Herbert A Wood	6	7	17	SW1/4 of SE1/4	40	3/1/78	4/24/85
51-149	DeWitt McKenney	Frank P Pray	6	7	17	SW1/4 of SE1/4	40	9/18/90	2/12/92
49-492	L M McKenney et ux	Frank P Pray	6	7	17	SW1/4 of SE1/4	40	10/2/92	2/12/92
49-494	Herbert A Wood et al	Frank P Pray	6	7	17	SW1/4 of SE1/4	40	10/2/92	2/12/92
51-217	F P & Mabel Pray	Manuel Rogers	6	7	17	SW1/4 of SE1/4	40	2/8/92	3/16/92
10-216	US/Cal	Manuel Rogers	6	7	17	SW1/4 of NW1/4	40	10/4/07	10/11/07
10-216	US/Cal	Manuel Rogers	6	7	17	SW1/4 of SW1/4	40	10/4/07	10/11/07
8-120	US	Herbert A Wood	6	7	20	N1/2 of NE1/4	80	3/1/78	4/24/85
51-149	DeWitt McKenney	Frank P Pray	6	7	20	N1/2 of NE1/4	80	9/18/90	2/12/92
49-492	L M McKenney et ux	Frank P Pray	6	7	20	N1/2 of NE1/4	80	10/2/92	2/12/92
49-494	Herbert A Wood et al	Frank P Pray	6	7	20	N1/2 of NE1/4	80	10/2/92	2/12/92
51-217	F P & Mabel Pray	Manuel Rogers	6	7	20	N1/2 of NE1/4	80	2/8/92	3/16/92
51-583	F R Evora	Manuel Rogers	6	7	20	SE1/4 of NE1/4	40	9/16/92	9/16/92
51-583	F R Evora	Manuel Rogers	6	7	20	E1/2 of SE1/4	80	9/16/92	9/16/92
		Manuel Rogers	6	7	20	W1/2 of SE1/4	80	1895 map	
10-216	US/Cal	Manuel Rogers	6	7	20	NW1/4 of SW1/4	40	10/4/07	10/11/07
		Manuel Rogers			20	SW1/4	160	1895 map	
51-217	F P & Mabel Pray	Manuel Rogers	6	7	21	NE1/4, N1/2 of NW1/4	240	2/8/92	3/16/92
51-149	DeWitt McKenney	Frank P Pray	6	7	21	NE1/4, N1/2 of NW1/4	240	9/18/90	2/12/92

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49-492	L M McKenney et ux	Frank P Pray	6	7	21	NE1/4, N1/2 of NW1/4	240	10/2/92	2/12/92
49-497	Irene A McKenney et al	Frank P Pray	6	7	21	NE1/4, N1/2 of NW1/4	240	10/2/92	2/12/92
51-153	Arthur C McKenney et al	Frank P Pray	6	7	21	NE1/4, N1/2 of NW1/4	240	10/2/92	2/12/92
51-583	F R Evora	Manuel Rogers	6	7	21	SW1/4 of NW1/4	40	9/16/92	9/16/92
47-91	Hartshorne, Claytons	Manuel Rogers	6	7	22	W1/2	320	6/17/90	6/23/90
10-216	US/Cal	Manuel Rogers	6	7	22	NW1/4 of NE1/4	40	10/4/07	10/11/07
8-354	Cal	Benj M Hartshorn	6	7	27	W1/2, SE1/4	480	8/16/81	1/9/87
47-91	Hartshorne, Claytons	Manuel Rogers	6	7	27	W1/2, SE1/4	480	6/17/90	6/23/90
10-216	US/Cal	Manuel Rogers	6	7	27	NW1/4 of NE1/4	40	10/4/07	10/11/07
51-585	J R Bernardo	Manuel Rogers	6	7	28	E1/2 of NW1/4	80	9/15/92	
51-585	J R Bernardo	Manuel Rogers	6	7	28	W1/2 of NE1/4	80	9/15/92	

### Northern Project Area

#### 1. Frederick A. Hyde

<u>Ref</u>	<u>Grantor</u>	<u>Grantee</u>	<u>T S R E Sec Fraction</u>				<u>Acres</u>	<u>Inst Date</u>	<u>Rec Date</u>
10-447	US	SPRR	6	6	11		640	4/20/75	3/18/19
		Frederick A Hyde	6	6	11			1895 map	
81-120	Coleman Brashears	F A Hyde	6	6	12	S1/2 of SW1/4	80	4/13/03	4/13/03
81-120	Coleman Brashears	F A Hyde	6	6	12	SW1/4 of SE1/4	40	4/13/03	4/13/03
10-447	US	SPRR	6	6	13		640	4/20/75	3/18/19
44-483	Caroline Rogers	Frederick A Hyde	6	6	13	E1/2	2847.1	2/28/90	2/28/90
97-364	SP Land Co	Standard Inv Co	6	6	13	W1/2	320	3/26/23	1/26/25
91-500	E W VanDeventer et ux	F A Hyde Inc	6	6	14	SW1/4 of SE1/4	40	9/6/04	9/12/04
91-500	E W VanDeventer et ux	F A Hyde Inc	6	6	14	S1/2 of SW1/4	80	9/6/04	9/12/04
91-500	E W VanDeventer et ux	F A Hyde Inc	6	6	14	NW1/4 of SW1/4	40	9/6/04	9/12/04
97-363	Redmond & Braren	Standard Inv Co	6	6	14	SW1/4 of NE1/4	40	2/5/23	1/26/25
97-363	Redmond & Braren	Standard Inv Co	6	6	14	S1/2 of NW1/4	80	2/5/23	1/26/25
97-363	Redmond & Braren	Standard Inv Co	6	6	14	SE1/4 of SE1/4	40	2/5/23	1/26/25
10-447	US	SPRR	6	6	15		640	4/20/75	3/18/19
75-457	SP Land Co	Standard Inv Co	6	6	15		640	4/26/23	8/21/24

<u>Ref. #</u>	<u>Grantor</u>	<u>Grantee</u>	<u>T S R E Sec Fraction</u>				<u>Acres</u>	<u>Inst Date</u>	<u>Rec Date</u>
97-362	Oluf and Alice Braren	Standard Inv Co	6	6	22	N1/2 of NW1/4	80	2/5/23	1/26/25
10-447	US	SPRR	6	6	23		640	4/20/75	3/18/19
		Frederick A Hyde	6	6	23			1895 map	
10-129	US/Cal	S P Rogers	6	6	24	NW1/4	160	10/19/03	10/30/03
85-50	Ella C Maze	F A Hyde	6	6	24	NW1/4	160	8/6/03	6/10/03
9 64	US	J S Franklin	6	6	24	SW1/4	160	9/18/90	10/29/90
44-481	Caroline Rogers	Frederick A Hyde	6	6	24	W1/2	1120.5	2/28/90	4/4/90
8-287	US	James T Chism	6	6	24	NE1/4	160	4/20/75	9/28/86
8-289	US	David Hays	6	6	24	SE1/4	160	2/1/75	9/28/86
44-483	Caroline Rogers	Frederick A Hyde	6	6	24	E1/2		2/28/90	2/28/90
10-447	US	SPRR	6	6	25		640	4/20/75	3/18/19
296-102	SPRR	F A Hyde	6	6	25	SE1/4	160	8/11/19	9/10/19
77-411	F A Hyde	Standard Inv Co	6	6	25	SE1/4	160	6/13/22	8/21/24
44-483	Caroline Rogers	Frederick A Hyde	6	6	25	N1/2, SW1/4		2/28/90	2/28/90
10 25	US	Alexander Vass	6	6	26	E1/2 of SW1/4	80	5/6/96	6/23/99
10 25	US	Alexander Vass	6	6	26	SE1/4 of NW1/4	40	5/6/96	6/23/99
10 25	US	Alexander Vass	6	6	26	SW1/4 of NE1/4	40	5/6/96	6/23/99
92-492	Ann Cunningham	F A Hyde	6	6	26	W1/2 of SE1/4	80	11/23/02	5/10/03
10-403	US	Marg. M. Fetterman	6	6	26	W1/2 of NW1/4	80	4/16/17	5/28/17
10-403	US	Marg. M. Fetterman	6	6	26	W1/2 of SW1/4	80	4/16/17	5/28/17
10-195	US	Geo Brown	6	6	26	E1/2 of NE1/4	80	10/25/95	9/19/06
10-195	US	Geo Brown	6	6	26	NW1/4 of NE1/4	40	10/25/95	9/19/06
10-195	US	Geo Brown	6	6	26	NE1/4 of NW1/4	40	10/25/95	9/19/06
		Frederick A Hyde	6	6	26	W1/2		1895 map	
10-447	US	SPRR	6	6	27		640	4/20/75	3/18/19
		Frederick A Hyde	6	6	27			1895 map	
97-362	Oluf and Alice Braren	Standard Inv Co	6	6	30	S1/2 of lot 9	40	2/5/23	1/26/25
97-362	Oluf and Alice Braren	Standard Inv Co	6	6	30	SW1/4 of SE1/4	40	2/5/23	1/26/25
45-330	Samuel Driver	Frederick A Hyde	6	6	34	SE1/4	160	12/20/89	1/23/90
40-70	State of Calif	Frederick A Hyde	6	6	34	SE1/4		2/28/90	30/1/90
10-447	US	SPRR	6	6	35		640	4/20/75	3/18/19
44-483	Caroline Rogers	Frederick A Hyde	6	6	35			2/28/90	2/28/90

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44-481	Caroline Rogers	Frederick A Hyde	6	6	36				
10-447	US	SPRR	6	7	7		2/28/90	4/4/90	
44-483	Caroline Rogers	Frederick A Hyde	6	7	7	S1/2 of SE1/4	640	4/20/75	3/18/19
44-483	Caroline Rogers	Frederick A Hyde	6	7	7			2/28/90	2/28/90
44-483	Caroline Rogers	Frederick A Hyde	6	7	7	lots 6-10		2/28/90	2/28/90
97-364	SP Land Co	Standard Inv Co	6	7	7	NE1/4, lots1-5	495.73	3/26/23	1/26/25
97-364	SP Land Co	Standard Inv Co	6	7	7	N1/2 of SE1/4	80	3/26/23	1/26/25
8-420	US	Harmon T Smith	6	7	18	lots 1-2	160	10/1/79	10/22/87
8-494	US	James T Chism	6	7	18	lots 8-9	160	9/10/80	6/6/88
44-483	Caroline Rogers	Frederick A Hyde	6	7	18	1-2, 8-9		2/28/90	2/28/90
9-193	US	U G Sperry	6	7	18	lot 10, S1/2 of SE1/4	160	10/2/91	1/2/92
49-193	Ulyses G Sperry	Frederick A Hyde	6	7	18	lot 10		9/13/90	9/17/90
49-193	Ulyses G Sperry	Frederick A Hyde	6	7	18	S1/2 of SE1/4		9/13/90	9/17/90
68-81	Frank Frago, et ux	F A Hyde	6	7	18	lots 5-7, 18	143.35	2/3/00	2/3/00
10-447	US	SPRR	6	7	19		640	4/20/75	3/18/19
44-483	Caroline Rogers	Frederick A Hyde	6	7	19	lots 2-7		2/28/90	2/28/90
97-364	SP Land Co	Standard Inv Co	6	7	19	E1/2, lots 1, 8-10	640	3/26/23	1/26/25
97-364	SP Land Co	Standard Inv Co	6	7	23		640	3/26/23	1/26/25
10-447	US	SPRR	6	7	29		640	4/20/75	3/18/19
		Frederick A Hyde	6	7	29			1895 map	
10-447	US	SPRR	6	7	31		640	4/20/75	3/18/19
		Frederick A Hyde	6	7	31			1895 map	
53-298	E F Robison	Frederick A Hyde	7	5	36	S1/2 of SW1/4	120	12/20/92	12/24/92
53-298	E F Robison	Frederick A Hyde	7	5	36	SW1/4 of SE1/4		12/20/92	12/24/92
86-578	F A Hyde & Eli F Robisor	F A Hyde & Co	7	5	36	S1/2 of SW1/4	670.43	1/27/04	6/30/04
86-578	F A Hyde & Eli F Robisor	F A Hyde & Co	7	5	36	SW1/4 of SE1/4		1/27/04	6/30/04
8-492	US	Antoni Fraser	7	6	2	NE1/4	160.47	3/1/78	6/8/88
44-481	Caroline Rogers	Frederick A Hyde	7	6	2	NE1/4		2/28/90	4/4/90
86-301	SPRR	F Hyde	7	6	35	W1/2	320	12/23/03	12/31/03
19-524	Eugene Murray	Frederick A Hyde	7	7	16	W1/2		1/13/77	not noted
19-526	Frederick A Hyde	C Hartson	7	7	16			1/13/77	9/15/80
13-3	James Hobson	Frederick A Hyde	7	8	27	W1/2		8/27/74	9/19/74

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79-639	Joseph P Hatch	F A Hyde	8	5	4	SE1/4 of NE1/4	40	6/8/03	6/10/03
79-639	Joseph P Hatch	F A Hyde	8	5	4	E1/2 of SE1/4	80	6/8/03	6/10/03
79-639	Joseph P Hatch	F A Hyde	8	5	4	NW1/4 of SE1/4	40	6/8/03	6/10/03
163-166	SPRR	F A Hyde	8	5	21		640	3/24/89	9/11/05
53-298	E F Robison	Frederick A Hyde	8	6	6	lot 1	150.67	12/20/92	12/24/92
53-298	E F Robison	Frederick A Hyde	8	6	6	SE1/4 of NE1/4		12/20/92	12/24/92
53-298	E F Robison	Frederick A Hyde	8	6	6	E1/2 of SE1/4		12/20/92	12/24/92
86-578	F A Hyde & Eli F Robisor	F A Hyde & Co	8	6	6	lot 1, SE1/4 of NE1/4		1/27/04	6/30/04
53-298	E F Robison	Frederick A Hyde	8	6	8	SW1/4 of NE1/4	160	12/20/92	12/24/92
53-298	E F Robison	Frederick A Hyde	8	6	8	SE1/4 of NW1/4		12/20/92	12/24/92
53-298	E F Robison	Frederick A Hyde	8	6	8	E1/2 of SW1/4		12/20/92	12/24/92
53-298	E F Robison	Frederick A Hyde	8	6	18	E1/2 of NE1/4	160	12/20/92	12/24/92
86-578	F A Hyde & Eli F Robisor	F A Hyde & Co	8	6	8	SW1/4 of NW1/4		1/27/04	6/30/04
86-578	F A Hyde & Eli F Robisor	F A Hyde & Co	8	6	8	SE1/4 of NW1/4		1/27/04	6/30/04
86-578	F A Hyde & Eli F Robisor	F A Hyde & Co	8	6	8	E1/2 of SW1/4		1/27/04	6/30/04
53-298	E F Robison	Frederick A Hyde	8	6	18	E1/2 of SE1/4		12/20/92	12/24/92
86-578	F A Hyde & Eli F Robisor	F A Hyde & Co	8	6	18	E1/2 of NE1/4		1/27/04	6/30/04
86-578	F A Hyde & Eli F Robisor	F A Hyde & Co	8	6	18	E1/2 of SE1/4		1/27/04	6/30/04
68-318	Frank Thiele	F A Hyde	8	6	24	NE1/4	160	1/22/98	4/4/01
53-298	E F Robison	Frederick A Hyde	8	6	30	lot 3	79.76	12/20/92	12/24/92
53-298	E F Robison	Frederick A Hyde	8	6	30	N1/2 lot 5		12/20/92	12/24/92
86-578	F A Hyde & Eli F Robisor	F A Hyde & Co	8	6	30	lot 3, N1/2 lot 5		1/27/04	6/30/04

### Southern Project Area

#### 1. Timothy Paige

<u>Ref.</u>	<u>Grantor</u>	<u>Grantee</u>	<u>T E R E Sec Fraction</u>				<u>Acres</u>	<u>Inst Date</u>	<u>Rec Date</u>
10-447	US	SPRR	7	6	1	frac	689.4	4/20/75	3/18/19
53-137	SPRR	Tim Paige	7	6	1	frac	689.4	3/3/93	3/6/93
9-199	US	James Moore	7	6	2	SE1/4	160	4/13/91	1/23/92
42-104	James Moore	Tim Paige	7	6	2	SE1/4	160	6/14/88	6/14/88

<u>Ref. #</u>	<u>Grantor</u>	<u>Grantee</u>	<u>T S R E Sec</u>			<u>Fraction</u>	<u>Acres</u>	<u>Inst Date</u>	<u>Rec Date</u>
9-258	US	SPRR	7	6	9		640	3/21/92	8/11/92
53-137	SPRR	Tim Paige	7	6	9		640	3/3/93	3/6/93
10-447	US	SPRR	7	6	11		640	4/20/75	3/18/19
49-346	SPRR	Tim Paige	7	6	11		640	10/19/91	10/31/91
9-204	US	John H Weddle	7	6	12	S1/2 of SE1/4	80	10/2/91	1/23/92
9-204	US	John H Weddle	7	6	12	S1/2 of SW1/4	80	10/2/91	1/23/92
44-417	John H. Weddle	Tim Paige	7	6	12	S1/2 of SE1/4		12/17/89	12/21/89
44-417	John H. Weddle	Tim Paige	7	6	12	S1/2 of SW1/4		12/17/89	12/21/89
9-211	US	Chas B Snyder	7	6	12	N1/2 of NE1/4	80	8/13/89	1/23/92
9-211	US	Chas B Snyder	7	6	12	N1/2 of NW1/4	80	8/13/89	1/23/92
38-413	Chas B Snyder	Tim Paige	7	6	12	N1/2 of NE1/4	80	12/29/87	1/3/88
38-413	Chas B Snyder	Tim Paige	7	6	12	N1/2 of NW1/4	80	12/29/87	1/3/88
9-201	Chas B Snyder	Tim Paige	7	6	12	S1/2 of NW1/4	80	10/10/89	1/23/92
9-201	Chas B Snyder	Tim Paige	7	6	12	N1/2 of SW1/4	80	10/10/89	1/23/92
38-413	Chas B Snyder	Tim Paige	7	6	12	S1/2 of NW1/4	80	12/29/87	1/3/88
38-413	Chas B Snyder	Tim Paige	7	6	12	N1/2 of SW1/4	80	12/29/87	1/3/88
9-209	US	John F Snyder	7	6	12	N1/2 of SE1/4	80	8/13/89	1/23/92
9-209	US	John F Snyder	7	6	12	S1/2 of NE1/4	80	8/13/89	1/23/92
38-466	J F Snyder	Tim Paige	7	6	12	N1/2 of SE1/4	160	1/3/88	1/7/88
38-466	J F Snyder	Tim Paige	7	6	12	S1/2 of NE1/4		1/3/88	1/7/88
10-447	US	SPRR	7	6	13		640	4/20/75	3/18/19
53-137	SPRR	Tim Paige	7	6	13		640	3/3/93	3/6/93
9-258	US	SPRR	7	6	15	NW1/4, S1/2	480	3/21/92	8/11/92
10-447	US	SPRR	7	6	15	NE1/4	160	4/20/75	3/18/19
53-137	SPRR	Tim Paige	7	6	15	frac	561.87	3/3/93	3/6/93
10-402	US	Alexander W Hearne	7	6	22	lots 1, 2, 8 & 9	159.13	7/20/16	4/9/17
10-479	US	Walter Lee Isom	7	6	22	lots 3, 6-7	321.43	8/18/19	11/10/19
10-479	US	Walter Lee Isom	7	6	22	lots 10-11, 14-16		8/18/19	11/10/19
11-225	US	Walter Lee Isom	7	6	22	lots 4-5, 12-13	151.39	9/6/23	1/24/28
		Tim Paige	7	6	22			1895 map	
9-258	US	SPRR	7	6	23		713.32	3/21/92	8/11/92
53-137	SPRR	Tim Paige	7	6	23		640	3/3/93	3/6/93

<u>Ref. #</u>	<u>Grantor</u>	<u>Grantee</u>	<u>T</u>	<u>S</u>	<u>R</u>	<u>E</u>	<u>Sec</u>	<u>Fraction</u>	<u>Acres</u>	<u>Inst Date</u>	<u>Rec Date</u>
9-203	US	Jos A Allen	7	6	24			NW1/4	166.93	10/2/91	1/23/92
		Tim. Paige	7	6	24			NW1/4		1895 map	
9-258	US	SPRR	7	6	25				612.19	3/21/92	8/11/92
53-137	SPRR	Tim Paige	7	6	25				640	3/3/93	3/6/93
38-527	Geo M. Miller	Tim Paige	7	7	4			SW1/4	160	23/1/88	2/11/88
44-46	SPRR	Tim Paige	7	7	5			fractional	643.52	3/23/89	3/26/89
9-207	US	Peter Dahl	7	7	6			S1/2 lots 11-13, 15	168.07	2/25/91	1/23/92
42-43	Peter Dahl	Tim Paige	7	7	6			S1/2 lots 11-13, 15	168.07	5/11/88	5/16/88
9-205	US	Wm Cummins	7	7	6			lots 3-6	161.9	11/24/90	1/23/92
42-558	Wm E Cummins	Tim Paige	7	7	6			lots 3-6	161.85	1/5/89	1/28/89
9-208	US	James Petersen	7	7	6			SE1/4	160	2/25/91	1/23/92
47-113	James Petersen	Tim Paige	7	7	6			SE1/4	160	6/7/90	7/8/00
9-214	US	Thos Dragoo	7	7	6			lots 1-2, S1/2 of NE1/4	161.9	2/25/91	1/23/92
52-559	Thos Dragoo	Tim Paige	7	7	6			lots 1-2, S1/2 of NE1/4	161.88	1/25/89	1/28/89
10-447	US	SPRR	7	7	7				992.52	4/20/75	3/18/19
38-572	SPRR	Tim Paige	7	7	7			fractional	992.52	2/5/88	3/3/88
10-447	US	SPRR	7	7	17				640	4/20/75	3/18/19
48-132	SPRR	Tim Paige	7	7	17			N1/2	960	9/2/90	9/5/90
53-362	SPRR	Tim Paige	7	7	17			S1/2	1951.7	3/3/93	3/6/93
10-447	US	SPRR	7	7	19				991.72	4/20/75	3/18/19
53-362	SPRR	Tim Paige	7	7	19			fractional		3/3/93	3/6/93
9-212	US	Jennie Wilson	7	7	20			S1/2 of SE1/4	80	6/3/91	1/23/92
9-212	US	Jennie Wilson	7	7	20			S1/2 of SW1/4	80	6/3/91	1/23/92
42-382	Jennie Wilson	Tim Paige	7	7	20			S1/2 of SE1/4	80	10/30/88	11/5/88
42-382	Jennie Wilson	Tim Paige	7	7	20			S1/2 of SW1/4	80	10/30/88	11/5/88
10-447	US	SPRR	7	7	21				640	4/20/75	3/18/19
53-362	SPRR	Tim Paige	7	7	21					3/3/93	3/6/93
10-447	US	SPRR	7	7	29				640	4/20/75	3/18/19
48-132	SPRR	Tim Paige	7	7	29					9/2/90	9/5/90
9-200	US	Charles E Wilcox	7	7	30			E1/2 of NE1/4	80	12/31/90	1/23/92
9-200	US	Charles E Wilcox	7	7	30			E1/2 of SE1/4	80	12/31/90	1/23/92
42-17	Chas/Liz Wilcox	Tim Paige	7	7	30			E1/2 of NE1/4	160	4/7/88	4/18/88

<u>Ref. #</u>	<u>Grantor</u>	<u>Grantee</u>	<u>T</u>	<u>S</u>	<u>R</u>	<u>E</u>	<u>Sec</u>	<u>Fraction</u>	<u>Acres</u>	<u>Inst Date</u>	<u>Rec Date</u>
42-17	Chas/Liz Wilcox	Tim Paige	7	7	30			E1/2 of SE1/4		4/7/88	4/18/88
9-217	US	Elisha H Robison	7	7	30			lot 3	80	4/13/91	1/23/92
43-12	Elisha H Robinson	Tim Paige	7	7	30			lot 3	80	6/29/88	7/17/88
38-73	Tim Paige	AG & CA Stonesifer	7	8				metes & bounds	1252	10/10/87	10/12/87
38-73	Tim Paige	AG & CA Stonesifer	7	8				metes & bounds	8.11	10/10/87	10/12/87
36-354	A Montgomery	Tim Paige	7	9				metes & bounds	2847	4/11/87	4/16/87
36-354	A Montgomery	Tim Paige	7	9				metes & bounds	20.95	4/11/87	4/16/87

## 2. John W. Sharp

<u>Ref.</u>	<u>Grantor</u>	<u>Grantee</u>	<u>T</u>	<u>S</u>	<u>R</u>	<u>E</u>	<u>Sec</u>	<u>Fraction</u>	<u>Acres</u>	<u>Inst Date</u>	<u>Rec Date</u>
10 39	US/Cal	John W Sharp	7	6	26			NW1/4 of NW1/4	40	3/3/00	4/21/00
9 46	US	John W Sharp	7	6	26			W1/2 of NE1/4	80	6/27/90	8/19/90
9 46	US	John W Sharp	7	6	26			W1/2 of SE1/4	80	6/27/90	8/19/90
47-193	John M Newsom	John W Sharp	7	6	26			SE1/4 of SE1/4	40	8/2/90	8/6/90
9-431	US	John M Newsom	7	6	26			SE1/4 of SE1/4	40	1/18/92	5/13/95
8-396	US	John W Sharp	7	6	26			E1/2 of NW1/4	80	4/28/87	9/7/87
11 61	US	John W Sharp	7	6	26			E1/2 of NE1/4	80	6/16/22	8/5/22
11 61	US	John W Sharp	7	6	26			NE1/4 of SE1/4	40	6/16/22	8/5/22
11 61	US	John W Sharp	7	6	26			SW1/4 of SW1/4	40	6/16/22	8/5/22
11 61	US	John W Sharp	7	6	26			NW1/4	160	6/16/22	8/5/22
9-258	US	SPRR	7	6	27				640	3/21/92	8/11/92
49-471	SPRR	John W Sharp	7	6	27			W1/2 of NE1/4	80	10/28/91	2/1/92
49-471	SPRR	John W Sharp	7	6	27			NW1/4	160	10/28/91	2/1/92
49-471	SPRR	John W Sharp	7	6	27			NW1/4 of SE1/4	40	10/28/91	2/1/92
49-471	SPRR	John W Sharp	7	6	27			NE1/4 of SW1/4	40	10/28/91	2/1/92
49-471	SPRR	John W Sharp	7	6	27			W1/2 of SW1/4	80	10/28/91	2/1/92
9-258	US	SPRR	7	6	35				640	3/21/92	8/11/92
53-131	SPRR	John W Sharp	7	6	35			E1/2	320	6/8/92	8/27/92
10-194	US/Cal	John W Sharp	7	6	36				640	8/19/06	8/26/06
22-400	DJ/Clara Reeves	John W Sharp	7	7	26			NW1/4	160	12/29/81	1/3/82
31-494	Thos/Ang Mitchell	John W Sharp	7	7	26			S1/2	320	2/9/86	2/10/86

<u>Ref. #</u>	<u>Grantor</u>	<u>Grantee</u>	<u>T S R E Sec Fraction</u>	<u>Acres</u>	<u>Inst Date</u>	<u>Rec Date</u>
10-447	US	SPRR	7 7 27	640	4/20/75	3/18/19
31-494	Thos/Ang Mitchell	John W Sharp	7 7 27 N1/2 of E1/2 of SE1/4	40	2/9/86	2/10/86
36-216	SPRR	John W Sharp	7 7 27 E1/2 of NE1/4	80	2/24/87	3/12/87
11 61	US	John W Sharp	7 7 28 N1/2 of NE1/4	80	6/16/22	8/5/22
11 61	US	John W Sharp	7 7 28 N1/2 of NW1/4	80	6/16/22	8/5/22

### **Appendix III.**

Accounting given for the income and expenses related to the partnership of Russell B. Smith and William McVey by Maria L. Smith, executrix of the estate of Russell B. Smith, on November 17, 1877 (Stanislaus County, Probates, #3 [McHenry Museum]).

[Statement 1887

Statement Showing Sale of partnership sheep - the property of the late firm of Smith and McKay - which came into the possession of the Executive.

1876			
May 23	1	Lamb to M Galvin	\$ 1.00
" "	3	Lamb to A McBride	" 3.00
" "	1	Lamb to R B Purvis	" 1.00
" "	1	Lamb to J. C. Brown	" 1.00
June 30	257	Mutton sheep at \$1.00 to H. M. Ames	" 257.00
" "	155	Lamb to same at .75c	" 116.25
July 10	330	Ewes to same at \$1.00	" 330.00
" "	90	Lamb to same at .75c	" 67.50
Aug. 10		Mutton Newhall	" 50
" 12	1	Lamb to -	" 1.00
" 19	1	Lamb to Zachariah	" 1.00
" 24	1	Lamb to -	" 1.00
" 28	3	Lamb to Zachariah	" 3.00
" "	4	Lamb to -	" 4.00
" "	4	Mutton Ewes to J. Meyer	" 6.00
" "	3	Mutton Ewes to M Galvin	" 4.50
" "	1	Mutton Ewe to Other	" 1.50
			<u>\$ 799.25</u>

Page 30

Brought-over

856

\$ 799.25

1876

Aug. 28	21	Bucks to Bush	42.00
" "	2	Bucks to Corwell & Brin	5.00
" 31	1	Lamb to Zachariah	1.00
" "	1	Mutton Ewe to same	1.50
" "	7	Bucks to McLaughlin	24.00
" "	3	Bucks to A. Fairton	7.50
" "	2	Bucks to Doc Hudson	5.00
Sept. 7	2	Lambs to Portuguese	2.00
" 10	500	Ewes to Holt	562.50
" 15	2	Sheep to Zachariah	2.50
" 22	585	Ewes to Smith	1565.00
" 24	360	Ewes to Kithel & Jones at 1.25 per	450.00
Oct. 3	2725	Ewes to J.B. Worng at 1.00	2725.00
" 4	430	Lambs to Dohr at 70c.	301.00
" 12	1	Lamb to J.B. Brown	1.00
" "	13	Bucks to John Cox	31.50
" 13	1	Lamb to J.B. Brown	1.00
" "	3	Ewes to Mowallan	4.50
" "	3	Lambs to Newhall	3.00
" "	6	Ewes to same	9.00
" "	375	Ewes to Mowallan	532.50
			<del>6596.50</del>

Page 31)

Brought down

6539

6596.50

1876

Oct: 13

17 Lamb to Moore - May

17.00

" "

741 Lamb to J. B. King

at 75c.

555.75

7297

7169.25

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[Statement II]

Statement Showing money paid by the Executive in satisfaction of claims held by creditor of the partnership of R. B. Smith and William May at the death of R. B. Smith; and, also, of money paid and expended by the Executive in the care, management and settlement of the property and affairs of the said partnership.

1876 \* August 31 <sup>First National Bank</sup> ~~Bank of America~~  
to note of Smith & May (for check \$10.31) \$ 546.00

\* October 10. Note Bro.  
to same (C. 101) .. 6000.00

\* November 1. Note Bro.  
to same (C. 100) .. 2500.00

1877 \* April 14. Note Bro.  
to same (C. 101) .. 2181.70

————— \$ 11,227.70

1876

May 3 \* Manuel Mendonza.  
(heading sheep) " 27.00

" " \* A Bennett (heading) " 2000  
————— \$ 11,274.70

1876		Brought over.	\$ 11,214.10
May 3	(R)	Robert Curry (heeding) 1865	25.50
" 10		F. Wells (heeding)	3.00
" 11+16	(R)	James Gardner (heeding) 1865	10.00
" + 13		J. R. McDonald, groceries to sheep camp.	1.50
" 18	(R)	E. Thomas (heeding)	18.00
" "		Nails for sheep camp	.50
" 23		Coffee & nails for do.	1.00
" + 27		E. Thomas (work with breaks)	2.50
" "	(R)	A. T. Gear (woods & sh. Cp.) 1865	5.00
" 30		Nails for sh. Cp.	.25
" 31	(R)	D. M. Garner (marking) 1865	1.50
" "	(R)	J. W. Stewart (marking) 1865	1.50
June 1	(R)	B. T. Stewart (marking) 1865	1.50
" "		Nails for sh. Cp.	.25
" 9	(R)	John Murphy (dipping) 1865	2.00
" "	(R)	John Connor do B. (L)	2.00
" 10	(R)	H. Whalton do B. (m)	6.00
" "	(R)	John Williams (heeding) 1865	30.00
" "	(R)	F. Johnson (dipping) B. (6)	6.00
" "	(R)	E. Gillan (dipping) B. (6)	7.50
" "	(R)	J. W. Stewart do B. (9)	8.50
" "	(R)	George Brown do B. (7)	1.00
" "		Rice to sh. Cp.	.50
" 14	(R)	B. T. Stewart (dipping) 1865	2.00
" "		James Cain (marking)	2.50
			\$ 11,435.70

(29255)  
1876

Brought down \$11435.70

June 14	x	J. F. Doukin (Finner for St. Cf.)	1.75
"	"	J. R. Mc Donald, (Groom for St. Cf.)	
"	"	(R) James Grummelt (Dipping)	2.00
"	x 16	(R) James Chisum do V. (St.)	13.75
"	+ 20	Marellus Radona (Heeding) <sub>Broader R<sub>2</sub></sub>	10.00
"	+ 23	Load of wood for St. Cf.	2.00
"	29	(R) James Hall (Dipping) <sub>St. Cf.</sub>	2.00
"	+ 30	J. A. Wilson (Wood for St. Cf.)	1.00

July 1	(R)	J. A. Wilson, Co. Acc't	
		Taxes on sheep of S. & M <sup>os</sup> for 1876 \$144.90 Less reduction by or do of H. C. Seperson " 21.35	123.55
"	3	J. R. Mc Donald, Groom St. Cf.	.50
"	10	Expenses on \$378.27 from Oakland	2.50
"	13	(R) Antonio Martins (Heeding) <sub>Broader Co.</sub>	2.02
"	14	(R) Antonio Martins (Heeding) <sub>Broader Co.</sub>	83.50
"	15	Mc Donald (Groom for St. Cf.)	.50
"	"	(R) Augst Grauber (Heeding) <sub>Broader Co.</sub>	100.00
"	"	Antonio Martins (for St. Cf.)	17.00
"	"	Doukin, Finner (for Carlean)	.50
"	"	Load of food to St. Camp.	3.00
"	"	Mc Donald, (Carlean to St. Cf.)	.30
"	19	(R) Augst Grauber (Heeding) <sub>Broader Co.</sub>	39.50
"	20	L. G. Brauch (for services on application for reduction of tax)	2.50
			<u>\$12066.10</u>



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1876		Prot. down	\$ 12625.24
Oct. 4		J. McDonald, Land & H. Co.	75
" 16		Fred McMillan [building on cont?]	500
" "		Fred McMillan [road work H. Co?]	500
" 23	(R)	H. C. Strobel, [hearing? B. (g. g.)]	5300
Nov. 26		J. McDonald [satisfaction of an acct. for a large sum?]	
Dec. 2	(R)	for supplies to H. camp - 1st payment \$700.00	
" 27	(R)	2d payment " 20000 "	90000
1877		Charges for certificates & stuff.	50
Jan. 22	(R)	James Hogan [hearing? B. (c.)]	40.00
Feb. 23	(R)	John Rodgers, Sheriff Collector [same for 1876-7] on sheep I	2372
Mar. 20	(R)	Edward Cole [hearing? B. (k. k.)]	80.00
1876			
Sep. 13	(R)	J. McDonald, for gas, oil, & supplies for cow B. (L. L.) at sheep I.	57.38
	(R)	Isaburo Florentia [hearing? B. (m. m.)]	52.00
May 29	(R)	Frank Fisher [hearing? B. (k. n.)]	10.50
June 1	(R)	Thomas Bradley [hearing? B. (o. o.)]	74.00
July 2	(R)	J. F. Doukin [hearing? B. (j. j.)] + supplies to H. camp - balance on acct.	8.18
August 5		O'Connell & Co., as assignees of the claims of G. L. and others, for hearing & other work done with sheep - the said claims being a list	336.10
			\$ 14,271.48

See Memoirs of J. F. Doukin on page 98

Whole amt of money received  
from paid for account  
of the partnership \$ 1427.48

Whole amt of money re-  
ceived for account  
of partnership prop-  
erty received of every  
description " 7169.25

Am't of money paid \$ 7102.25  
and expended by the  
Executive of partnership  
ship account in ac-  
cess of partnership  
amt.

**APPENDIX C: BACKGROUND TRAFFIC REPORT**

**SECTION 1**

ADMINISTRATIVE DRAFT  
TRAFFIX ASSESSMENT  
for the

**DIABLO GRANDE  
DRAFT SPECIFIC PLAN**

Stanislaus County

November 1991

**Dowling  
Associates**

Transportation Engineering • Planning • Research • Education

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# Dowling Associates

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Transportation Engineering • Planning • Research • Education

November 21, 1991

Mr. Steve Erickson  
Stanislaus County  
Department of Public Works  
1100 H Street

SUBJECT: Administrative Draft - Traffic Assessment - Diablo Grande

900040.L3

Dear Mr. Erickson:

Please find attached an administrative draft of the traffic assessment for Diablo Grande. The technical appendices are available; however, they have not been included in this transmittal.

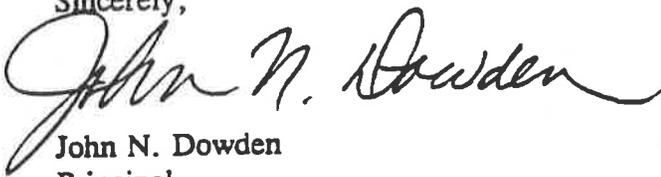
I took the liberty to send a copy of the report to both Bob Graham and Richard Grasseti. The purpose is to expedite the review process and provide an opportunity for LSA to input the draft into the EIR.

I am sorry there was a delay in getting this draft to you; however, I feel that most of the issues have been addressed and that the final report can be developed without any substantial increase in technical work.

Please review the report and submit to me a single unified set of comments, questions, changes or amendments you feel are appropriate.

I am available for question. Please do not hesitate to call if you require additional information.

Sincerely,



John N. Dowden  
Principal

cc:

Mr. Bob Graham - Diablo Grande  
Mr. Richard Grasseti

**ADMINISTRATIVE DRAFT  
TRAFFIX ASSESSMENT  
for the**

**DIABLO GRANDE  
DRAFT SPECIFIC PLAN**

**Stanislaus County**

**Conducted By  
Dowling Associates**

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**November 1991**

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## **INTRODUCTION**

Dowling Associates under contract with the County of Stanislaus conducted this assessment of the traffic impacts associated with the development of the December 1990 draft Diablo Grande Specific Plan. The scope of work was reviewed and approved by the County of Stanislaus staff.

The study incorporates extensive amounts of data from the Lakeborough DEIR and the Transportation Element of the Draft General Plan for the City of Patterson. Consideration was given to using the Stanislaus Area Association of Governments travel demand model for the cumulative analysis; however, the preliminary results from the model analysis were determined, by consultant and County staff, to be un-reasonable. Therefore, an alternative approach was developed.

## **SUMMARY**

The following summary highlights the impacts and recommended mitigation measures presented in this report.

### **Project Impacts**

- The project at full build out will generate 53,000 daily vehicle trips of which about 3,600 will occur in the AM peak hour and 5,200 in the PM peak hour. Of this traffic, about 24,000 daily and 1,580 AM and 2,400 PM peak hour trips will occur off-site.
- Primary access to the project will be along Oak Flat Road; however, additional access will be needed via Orestimba Road and Crow Creek Road (via Lakeborough). Further, a frontage road between Oak Flat Road and Del Puerto Canyon Road is needed.

**Existing Plus Project Mitigation Measures** - The project when added to existing traffic could produce the following roadway requirements.

- The upgrade to County standards of Oak Flat Road and Ward Avenue between Oak Flat Road and Sperry Road. The widening of Ward Avenue south to Fink Road does not appear needed.
- Traffic signals will be needed at the Sperry Road/I-5 southbound off-ramp and Ward Avenue/Sperry Road intersections. In addition, signals will be required along Ward Avenue at Marshall and Oak Flat Roads. As part of any signalization, additional turning lanes are also required. (See Table 14).

**Cumulative Without Lakeborough Plus Project Mitigation Measures - Under the cumulative without Lakeborough project option, the following roadway improvements will be required when the project is fully developed.**

- **Additional roadway capacity along I-5 between Stuhr Road and Sperry Road. North and south of these locations, the project will also contribute to daily traffic capacity needs.**
- **Roadway widening along Sperry Road between I-5 and Ward Avenue.**
- **Roadway widening along Ward Avenue from Sperry Road to Oak Flat Road.**
- **Roadway widening along Crows Landing Road north of West Main near Modesto**
- **Roadway widening along Crows Landing Road north of Grayson near Modesto.**
- **While the cumulative (without Lakeborough) condition requires traffic signals at most of the analysis intersections near the site, additional signalization will be needed at Ward Avenue and Oak Flat Road when the project is fully developed. Further, additional turning movement lanes will be needed at I-5 southbound and Sperry Road, Sperry Road at Ward Avenue, Ward Avenue at Marshall and Oak Flat Roads and within the new interchange located at Ward Avenue and I-5. (See Table 15).**

**Cumulative With Lakeborough Plus Project Mitigation Measures - Under the cumulative with Lakeborough project option, the following roadway improvements will be required when the project is fully developed.**

- **Roadway widening along Sperry Road between I-5 and Ward Avenue.**
- **Roadway widening along Ward Avenue from Sperry Road to Oak Flat Road.**
- **While the cumulative (with Lakeborough) condition requires traffic signals at all of the analysis intersections near the site, additional turning movement lanes will be needed at I-5 southbound and Sperry Road, Sperry Road and Ward Avenue, Ward Avenue at Marshall and Oak Flat Roads and within the new interchange located at Ward Avenue and I-5 when the project is full developed.**

#### **On-Site Mitigation Measures**

- **Oak Flat Road will need to be widened to four-lanes at about 75 percent build out of Phase 1.**

- **Oak Flat Road** within the site can be four-lanes as shown on the Specific Plan; however, the following traffic control measures should be used.
  - Stop sign controls at all major intersections should be provided on all approaches.
  - Driveway access and egress should be restricted for a distance of at least 100 feet from the curb return tangents at all intersections.
  - All major intersections at the Town Center and Shopping areas should provide for adequate exit storage lane capacity. (Parking lot circulation patterns should be designed to restrict access from parking lot traffic lanes to the exiting street segments to provide any required vehicle storage).
- Emergency vehicle access should be provided north of Phase 1 to Del Puerto Canyon Road.
- All major collector streets should provide capacity for center two-way left turn lanes and left turn storage lanes at intersection approaches.
- Residential, commercial, office and recreational parking demands should be met off-street with no parking provided along major collector roadways. Parking along minor collectors fronting on residential property can be allowed.
- Consideration should be given to restricting direct driveway access along all major arterial, major collector and minor collector roadways. Back-lot treatments if feasible should be encouraged.

## **SETTING**

The Diablo Grande project will be located in the southwest corner of Stanislaus County approximately 9 miles west of Interstate 5 (I-5) on Oak Flat Road. Oak Flat Road intersects Ward Road to the east of I-5. No freeway interchange with I-5 is provided at Oak Flat Road. Rather, Ward Avenue, to the north, accesses I-5 at the Sperry Ave/I-5 interchange west of the City of Patterson and to the south at the Fink Road/I-5 interchange west of the community of Crows Landing.

### **Existing Street System**

**Oak Flat Road:** Oak Flat Road is a two lane rural road. At the eastern terminus, Oak Flat Road intersects Ward Avenue. Stop sign control is provided on the eastbound approach of Oak Flat Road. Oak Flat Road is not developed to county standard. Rather, it is a paved facility with no developed

shoulders or pavement edge. Power polls are located along both sides of Oak Flat Road. In general, there is very limited development along Oak Flat Road. Most of the land is in agricultural use. Just east of I-5, Oak Flat Road crosses the California Viaduct on a two lane bridge. At I-5, Oak Flat Road crosses under the freeway. The current bridge structure does not provide adequate room for roadway widening. The current roadway appears to be able to accommodate three travel lanes. To the west of I-5, Oak Flat Road narrows to about 20 feet and is un-paved. Oak Flat Road carries very low levels of daily and peak hour traffic.

**Ward Avenue:** Ward Avenue is a north-south two-lane rural road. The road has a center yellow stripe with no developed shoulders or roadway edge. However, at the northern end of Ward near Sperry Avenue, Ward Avenue widens to provide a four lane county standard roadway configuration. Ward Avenue intersects Sperry Road to the north and Fink Road to the south. Ward Avenue accommodates 400 daily trips to the south of Oak Flat Road and 700 daily trips to the north. Peak hour traffic approaches about 50 trips.

**Sperry Road:** Sperry Road is a two lane east-west rural road that connects I-5 to the west with the City of Patterson and Highway 33 to the east. Highway 33 is a north-south highway about 3 miles to the east of the I-5. The I-5/Sperry Road interchange is a diamond interchange with Sperry Road passing under I-5. Stop sign controls are provided at the terminus of the off-ramps from the freeway. Sperry Road carries about 2,800 daily and 260 peak hour trips near I-5.

**Fink Road:** Fink Road is a two-lane east-west rural road that connects I-5 to the west of the community of Crows Landing and Highway 33 to the east. The I-5/Fink Road interchange is a diamond interchange with Fink Road passing under I-5. Stop sign controls are provided at the terminus of the off-ramps from the freeway. Fink Road carries about 1,440 daily and 120 peak hour trips near I-5.

**I-5 Freeway:** North-south highway access to the project is provide by I-5. Near the project, I-5 has two lanes in each direction separated by a median approximately 70 feet wide. The median in this area would have room enough for two more lanes in each direction. Between Sperry Road and Fink Road, I-5 carries about 21,200 daily and 3,000 peak hour trips.

**Highway 33:** To the east of I-5 regional access is provided by Route 33. Route 33 connects the communities of Newman at the southwestern end of the county to Grayson at the northwestern end of the county. In the vicinity of the project Route 33 has one lane in both the north and south direction, except in Patterson where Route 33 widens to two directional lanes.

Destinations for residents of the Diablo Grande development might include Modesto, or Turlock. Or via southbound Interstate 5 residents might travel to Los Banos or northbound on I-5 residents might travel to Tracy, Pleasanton or San Ramon.

To access Modesto residents might use Fink Rd. to Crows Landing Rd., Marshall Rd to Crows Landing Rd., or, Sperry Avenue through Patterson to Modesto.

In a similar manner Turlock can be accessed by using J17, an east/west route which intersects Crows Landing Rd., and can be accessed from Sperry Avenue.

## **EXISTING CONDITIONS**

The land along Oak Flat Road and adjacent to the other rural streets which access the site is generally undeveloped. Therefore, the existing traffic levels of service are very good. All of the freeway interchanges operate at high levels of service. The major interchanges impacted by this project are at I-5 and Sperry Road and Fink Road. While the project will generate traffic at the Stuhr Road/I-5 interchange, the impacts will be minimal. The existing level of service, by observation, within the interchange is "A". This condition should remain unchanged after the project is constructed.

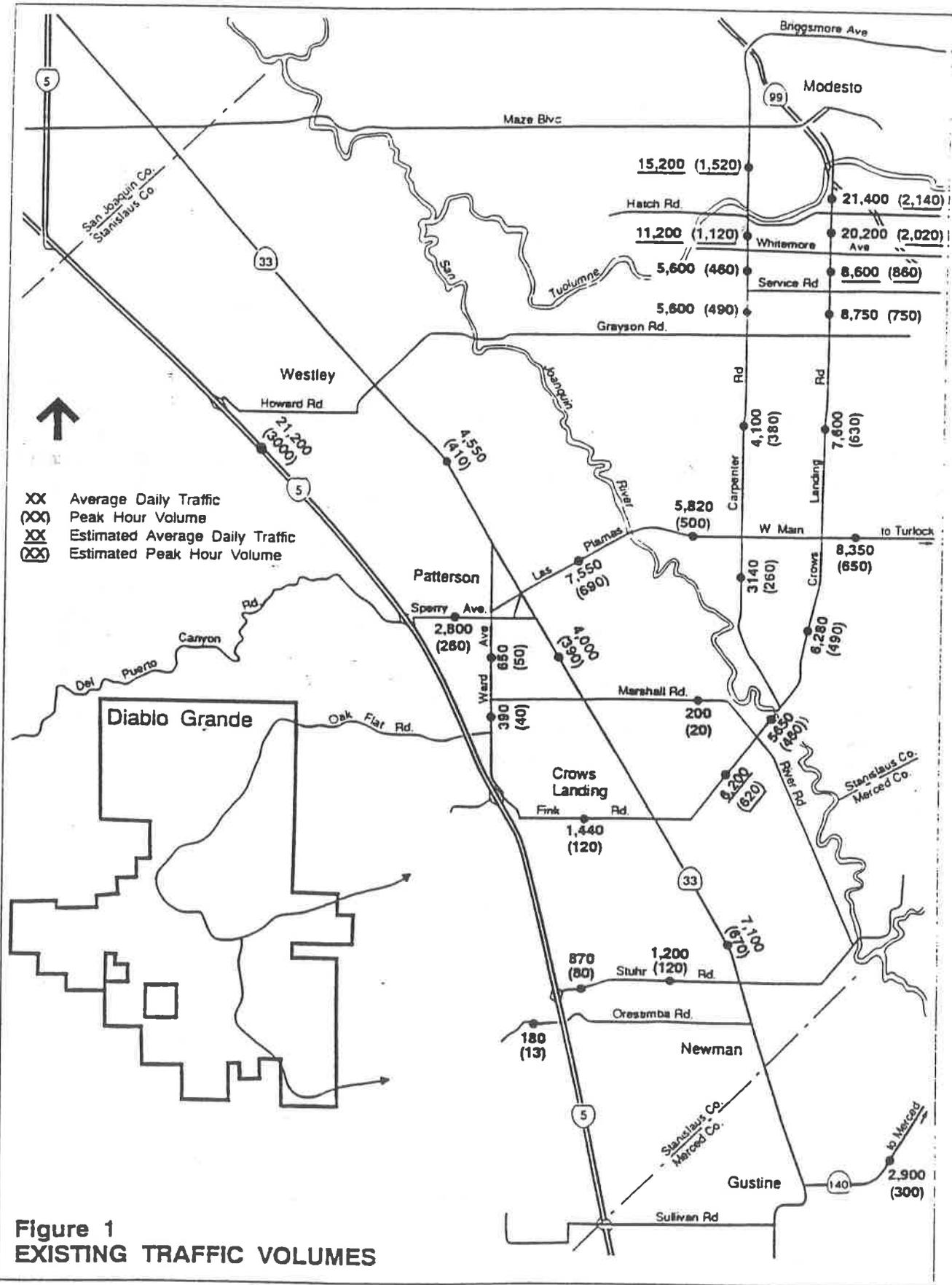
Figure 1 shows the existing average daily and peak hour traffic levels on I-5, Highway 33 and the other roadways serving the site. These data were provided by SAAG, Stanislaus County, and the Caltrans 1989 Traffic Volumes on California State Highways.

Peak hour traffic turn movement counts were not conducted for any of the freeway interchange or other local intersections. Limited data is available for PM peak hour conditions at the Sperry Road/I-5 interchange. No data is available at I-5 and Fink Road or Stuhr Roads. As these intersections serve rural areas, the existing traffic volumes at these locations are estimated to be very low.

Field observations of peak hour conditions confirm that all of the analysis intersections, which are listed below, operate at level of service (LOS) "A" or better during the AM and PM peak hours. The following intersections are analyzed throughout this report.

- I-5 SB ramps at Sperry Road
- I-5 NB ramps at Sperry Road
- Sperry Road at Ward Avenue
- Ward Avenue at Marshall Road
- Ward Avenue at Oak Flat Road
- I-5 SB ramps at Fink Road
- I-5 NB ramps at Fink Road
  
- I-5 SB ramps at the proposed Ward Avenue interchange
- I-5 NB ramps at the proposed Ward Avenue interchange

The two intersections at I-5 and Ward Avenue were proposed as part of the Lakeborough DEIR traffic assessment. The Diablo Grande Specific Plan project description assumes that the Lakeborough traffic mitigation measures are in place at full build out of the Diablo Grande project.



**Figure 1**  
**EXISTING TRAFFIC VOLUMES**

The traffic assessment evaluates a number of scenarios which assume both the existing and proposed street system configurations near the site.

## **PROJECT IMPACTS**

This section discusses the project impacts of the proposed Diablo Grande project. The project includes 5,000 residential units plus various support shopping, commercial and recreational uses. The project also provides for a resort complex which has a 240 room hotel facility with assorted recreational uses such as golf courses, spas, health center and other resort amenities.

The traffic impact analysis evaluated the trip generation potential for Phase 1 and full build out of the project. Phases 2 and 3 were not evaluated separately. For the Phase 1 analysis, project access is provided only along Oak Flat Road. For the full build out option, access is provided along Oak Flat Road, through the Lakeborough project to the proposed interchange at Ward Avenue and I-5, and to I-5 at Stuhr Road via Orestimba Road.

### **Trip Generation**

The trip generation rates applied to the project were developed and approved by the County using three sources: 1) the Institute of Traffic Engineers (ITE) Fifth Edition; 2) the City of San Diego; and 3) Dowling Associates. The rates are shown in Table 1. The resultant average daily and AM and PM peak hour traffic volumes generated by the project are also detailed in Table 1. The project is estimated to generate about 53,000 daily trips and 3,600 AM and 5,200 PM peak hour trips. Of these trips, a portion will stay on-site and travel between the residential and non-residential uses. The remaining traffic will travel to and from off-site destinations.

Table 1 - Project Trip Rates and Total Generation

Land Uses	Units	Quant.	Daily	AM Pk Hr			PM Pk Hr		
				In	Out	Total	In	Out	Total
Single Family	du	2,123.00	9.55	0.19	0.55	0.74	0.65	0.35	1.00
Attached Single Family	du	637.00	5.86	0.07	0.37	0.44	0.36	0.19	0.55
Multiple Family	du	500.00	6.47	0.09	0.42	0.51	0.43	0.20	0.63
Seasonal/Retirement SF/ASF	du	1,190.00	3.16	0.11	0.05	0.16	0.11	0.15	0.26
Seasonal/Retirement MF	du	550.00	3.16	0.11	0.05	0.16	0.11	0.15	0.26
Shopping Center/Town Ctr	kfsf	122.00	28.27	0.32	0.32	0.64	1.31	1.31	2.62
Office	kfsf	52.00	16.31	1.92	0.29	2.21	0.35	1.86	2.21
Research Campus	rooms	226.00	8.00	1.15	0.13	1.28	0.11	1.01	1.12
Hotel	kfsf	240.00	10.00	0.36	0.24	0.60	0.32	0.48	0.80
Restaurants	kfsf	10.00	96.51	0.86	0.08	0.94	5.36	2.30	7.66
Public Services	kfsf	40.00	0.79	0.41	0.07	0.48	0.06	0.34	0.40
Shopping Center/Town Ctr	kfsf	76.23	28.27	0.32	0.32	0.64	1.31	1.31	2.62
Golf Course	acres	899.00	8.00	0.38	0.10	0.48	0.22	0.50	0.72
Equestrian	acres	24.00	5.00	0.10	0.10	0.20	0.20	0.20	0.40
Parks	acres	242.00	5.00	0.10	0.10	0.20	0.20	0.20	0.40

Land Uses	Units	Quant.	Daily	AM Pk Hr			PM Pk Hr			
				In	Out	Total	In	Out	Total	
Single Family	du	2,123.00	20,275	403	1,168	1,571	1,380	743	2,123	
Attached Single Family	du	637.00	3,733	45	236	281	229	121	350	
Multiple Family	du	500.00	3,235	45	210	255	215	100	315	
Seasonal/Retirement SF/ASF	du	1,190.00	3,760	131	60	191	131	179	310	
Seasonal/Retirement MF	du	550.00	1,738	61	28	89	61	83	144	
Shopping Center/Town Ctr	kfsf	122.00	3,449	39	40	79	160	160	320	
Office	kfsf	52.00	848	100	15	115	18	97	115	
Research Campus	kfsf	226.00	1,808	260	29	289	25	228	253	
Hotel	rooms	240.00	2,400	86	58	144	77	115	192	
Restaurants	kfsf	10.00	965	9	1	10	54	23	77	
Public Services	kfsf	40.00	32	16	3	19	2	14	16	
Shopping Center/Town Ctr	kfsf	76.23	2,155	24	25	49	100	100	200	
Golf Course	acres	899.00	7,192	342	90	432	198	450	648	
Equestrian	acres	24.00	120	2	2	4	5	5	10	
Parks	acres	242.00	1,210	24	24	48	48	48	96	
<b>TOTALS</b>				<b>52,920</b>	<b>1,587</b>	<b>1,989</b>	<b>3,576</b>	<b>2,703</b>	<b>2,466</b>	<b>5,169</b>

du = dwelling units  
kfsf = 1,000 square feet

Figure 2 details the average daily traffic levels generated by the project on the surrounding street system.

**ERA Housing Mix Assumptions**

Table 2 summarizes the housing mix assumptions developed by ERA. These values were used to allocate the housing mix in the trip generation spreadsheet discussed below.

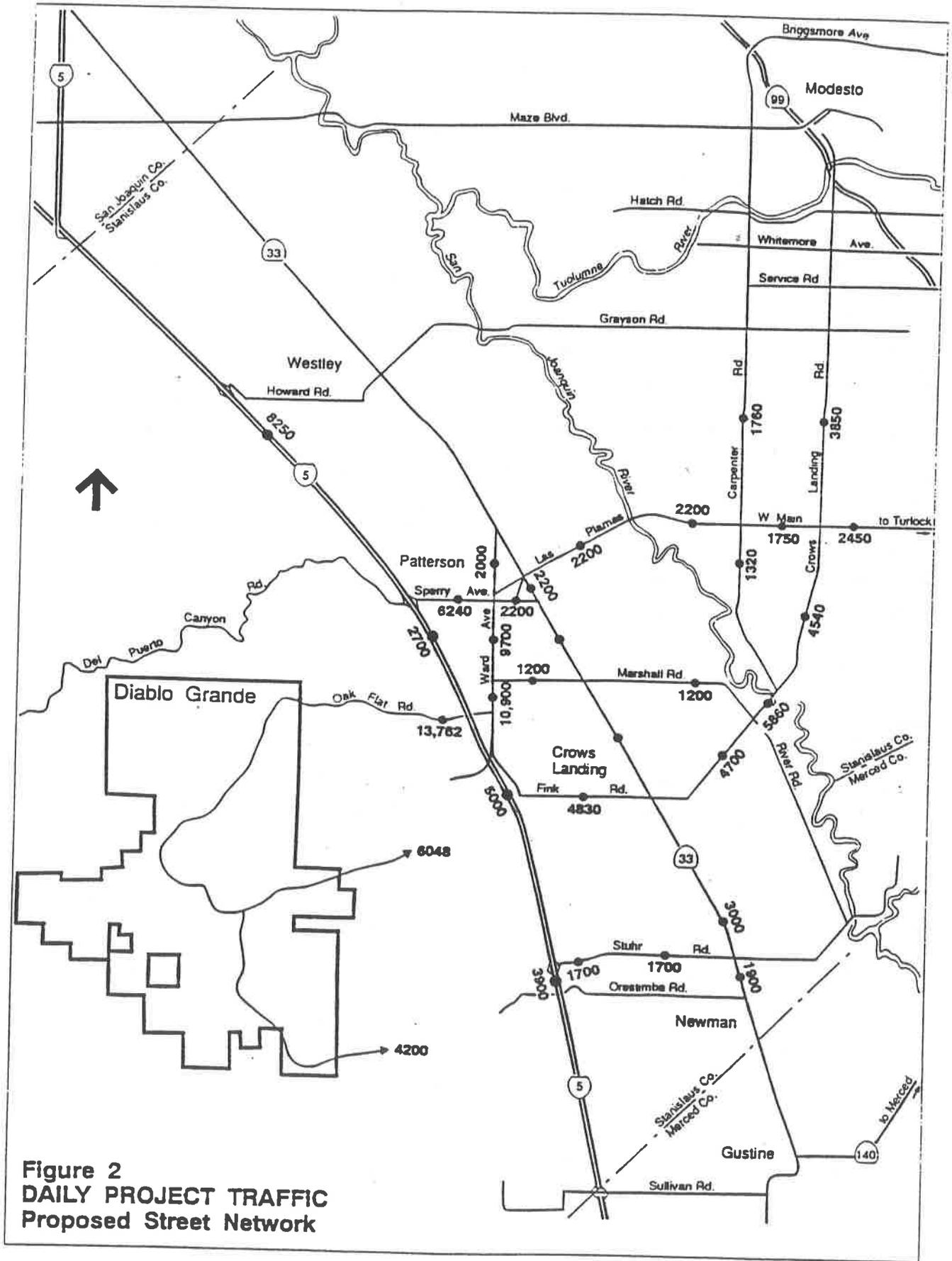
**Table 2 - Product Mix Percent By Phase**

Product Type	Phase 1	Phase 2	Phase 3	Phase 4	Total
Single Family Detached					
Permanent	70.0%	70.0%	70.0%	80.0%	71.9%
Retirement	20.0%	20.0%	30.0%	20.0%	22.6%
Seasonal	10.0%	10.0%	0.0%	0.0%	5.5%
Single Family Attached					
Permanent	50.0%	60.0%	70.0%	80.0%	55.6%
Retirement	35.0%	40.0%	30.0%	20.0%	32.8%
Seasonal	15.0%	0.0%	0.0%	0.0%	11.6%
Multiple Family					
Permanent	30.0%	40.0%	50.0%	50.0%	44.0%
Retirement	30.0%	50.0%	50.0%	50.0%	44.0%
Seasonal	40.0%	10.0%	0.0%	0.0%	12.0%

**On-Site and Off-site Traffic Allocation**

A spreadsheet model was developed to calculate the on and off-site trip generation for the project area. The model allocates land uses and intensities to each of the project development areas, i.e. Oak Flat and Copper Mountain. The trip generation rates noted in Table 1 were applied to calculate Daily, AM peak hour and PM peak hour traffic levels. The model assumes that all of the residential uses, except the hotel, produce traffic; while all of the recreational, resort, shopping center, town center, hotel and other non-residential development attract traffic. The model uses an input value for the percent of off-site commute housing stock to evaluate the balance between off-site and on-site traffic. Once the off-site (inbound and outbound) traffic levels have been calculated, the model estimates the required levels of off-site (inbound and outbound) traffic to and from the non-residential areas to produce a balance between total residential and non-residential traffic generation.

The input value for the percent of off-site commute housing stock is 57.34%. This value was determined by the analysis shown in Table 3. The basic adjustments to calculate off-site trip



**Figure 2**  
**DAILY PROJECT TRAFFIC**  
**Proposed Street Network**

generation values include: 1) total housing minus retirement and seasonal; 2) the result of #1 is factored by the on-site jobs and office-home percentages which are subtracted.

**Table 3 - Off-Site Commute Housing Stock Estimate**

Development Area	SF	ASF	MF	TOTAL	
Oak Flat	620	1040	540	2200	
Copper Mtn	400			400	
Indian Rocks	400			400	
Crow Creek	570	200	330	1100	
Orestimba	420	180	300	900	
<b>Totals</b>	<b>2410</b>	<b>1420</b>	<b>1170</b>	<b>5000</b>	
Permanent	71.90%	55.60%	44.00%		
Retirement	22.60%	32.80%	44.00%		
Seasonal	5.50%	11.60%	12.00%		
<b>Totals</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>		
Adjustments					
On-site Job (Of Net)	5.00%	10.00%	15.00%		
Office home (Of Net)	15.00%	10.00%	5.00%		
Starting total	2411	1421	1170	5002	
Permanent	+ 1733	790	515	3038	60.74%
Retirement	- 545	466	515	1526	
Seasonal	- 133	165	140	438	
<b>Net Total</b>	<b>1733</b>	<b>790</b>	<b>515</b>	<b>3038</b>	
Adjustments					
On-site Job	- 87	79	77		
Office home	- 260	79	26		
<b>Total Off-site</b>	<b>= 1519</b>	<b>797</b>	<b>552</b>	<b>2868</b>	<b>57.34%</b>

**Trip Generation By Phase**

Trip generation estimates were developed for each phase of the project. The traffic generated by each phase was allocated to on-site and off-site origins and destinations. Once the total traffic volumes were determined, the off-site traffic components for residential and non-residential traffic were allocated to specific access routes. The appendix of this report includes the trip generation mode runs for each development phase. Table 4 details the trip generation values.

**Table 4 - Trip Generation**

Development Condition	Average Daily	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
<b>Total Traffic Generation Values</b>							
Phase 1	21,794	635	830	1,465	1,110	974	2,084
Phase 2	32,687	1,003	1,218	2,221	1,645	1,515	3,163
Phase 3	44,081	1,326	1,634	2,960	2,233	2,052	4,285
Phase 4	52,920	1,587	1,988	3,575	2,701	2,467	5,168
<b>Off-Site Traffic Generation Values</b>							
Phase 1	9,410	210	405	615	532	409	941
Phase 2	14,850	385	600	985	805	680	1,485
Phase 3	19,810	493	801	1,294	1,098	883	1,981
Phase 4	24,010	587	988	1,575	1,343	1,058	2,401
<b>Off-Site Traffic Generation Increment by Phase</b>							
Phase 1	9,410	210	405	615	532	409	941
Phase 2	5,440	175	195	370	273	271	544
Phase 3	4,960	108	201	309	293	203	496
Phase 4	4,200	94	187	281	245	175	420
<b>Allocation to Access Routes</b>							
Oak Flat Road	13,762	350	561	911	750	626	1,376
Crow Creek via Lakeborough	6,048	143	240	383	348	257	605
Stuhr Road via Orestimba Road	4,200	94	187	281	245	175	420

### Peak Hour Off-Site Traffic Assumptions

Table 5 details the off-site trip allocations for Phase 1 and full build-out of the project. The traffic volumes for Phase 1 were assigned exclusively to Oak Flat Road. For the full build out scenario, the same allocation used to assign daily traffic to each access route was used.

**Table 5 - Off-Site Peak Hour Traffic Generation**

Development Condition	AM Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total
<b>Phase 1</b>						
Residential Traffic	167	405	572	480	298	778
Non-residential Traffic	43	0	43	52	111	163
Total Traffic	210	405	615	532	409	941
<b>Full Build Out</b>						
Residential Traffic	398	988	1,386	1,171	713	1,884
Non-residential Traffic	189	0	189	172	345	517
Total Traffic	587	988	1,575	1,343	1,058	2,404

### TRIP DISTRIBUTION AND CUMULATIVE TRAFFIC

#### Trip Distribution Assumptions

Dowling Associates and County staff reviewed the Lakeborough off-site trip distribution factors for residential and non-residential traffic. The various trip distribution values were adjusted to reflect access and egress from the Diablo Grande project. The following trip distribution values were applied for the daily and peak hour traffic analysis.

Off-site residential based trip distribution (vehicle trips originating from residential development within Diablo Grande)

- North on I-5 = 75%
- South on I-5 = 5%
- East to Newman = 2%
- North along Ward to Patterson = 3%
- East to W. Main and Turlock = 5%
- East to Carpenter Road into Modesto = 2.5%
- East to Crows Landing Road into Modesto = 7.5%

Off-site non-residential based trip distribution (vehicle trips generated by non-residential development within Diablo Grande)

- North on I-5 = 20%
- South on I-5 = 20%
- East to Newman = 15%
- North along Ward to Patterson = 5%
- East to W. Main and Turlock = 10%
- East to Carpenter Road into Modesto = 6%
- East to Crows Landing Road into Modesto = 19%

### **Cumulative Traffic Forecasts**

Dowling Associates attempted to use the SAAG model for the cumulative traffic analysis. Dowling Associates added the Diablo Grande project to the SAAG model and reran the 2010 assignment. Nearly all of the traffic was assigned to the roadways between the site and Modesto. No substantial amount of traffic was assigned along I-5 or towards the south-eastern portions of the County.

At the present time, the SAAG model is being calibrated to 1990 conditions. Further, the 2010 projections do not include the recent changes to the Patterson General Plan. Dowling Associates reviewed the cumulative traffic analysis conducted for the Lakeborough development. For that EIR, TJKM used the SAAG model, updated it for all of the projects not included in the 2010 land use, and refined the estimate of through traffic along the I-5 corridor. The Lakeborough EIR included the traffic generated by the following projects:

- 2010 build out of the County General Plan and its incorporated cities.
- Grayson Park
- Mapes Ranch
- Merced County projections for I-5.
- San Joaquin County projections for I-5.

To produce a more realistic forecast for off-site daily and peak hour traffic, Dowling Associates, with County approval, used the following process to estimate the cumulative traffic conditions.

- The 2010 daily and peak hour traffic forecasts provided in the Lakeborough EIR for the "with and without" Lakeborough project condition were used as the basic cumulative traffic projections for the study area streets.
- The growth in daily traffic projected for the build out of Patterson was added to the Lakeborough EIR projections to evaluate basic roadway travel lane requirements.

- The daily traffic from the Diablo Grande trip generation analysis was added to the above projections to produce the 2010 with project condition.
- For the peak hour analysis, the traffic projections from the Lakeborough EIR were supplemented with peak hour adjustments of the Patterson General Plan daily traffic projections. While no peak hour traffic assessment was included in the Patterson General Plan analysis, Dowling Associates applied a 10 percent peak hour and 67/33 and 33/67 percent directional split respectively to estimate the AM and PM peak hour traffic volumes for build out of the Patterson General Plan.
- Peak hour traffic volumes from the project were added to the above data to produce the existing plus project and cumulative plus project conditions. For the cumulative analysis, two options were considered: 1) a cumulative without Lakeborough; and 2) a cumulative with Lakeborough. For the first, the development of the Lakeborough project was added to the cumulative plus project conditions for full build out. For the second, the Lakeborough development was included in the cumulative and the Diablo Grande project added to estimate full build out.

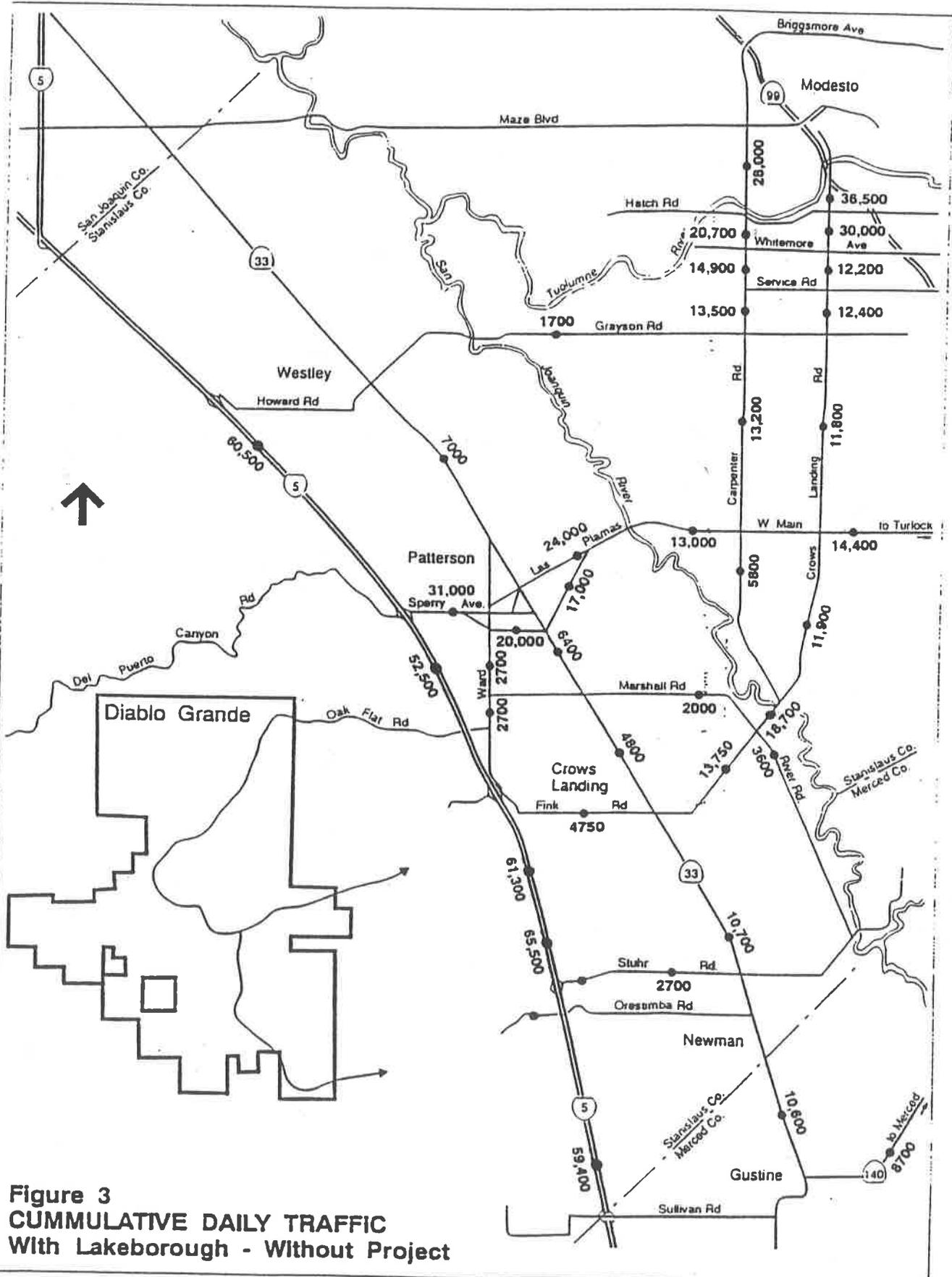
Figures 3 and 4 detail the average daily traffic volumes assumed for the cumulative traffic conditions. As noted, two options were investigated: 1) cumulative without Lakeborough; 2) cumulative with Lakeborough.

## **TRAFFIC IMPACTS AND MITIGATION MEASURES**

The traffic generated by the project was added to the surrounding street system to determine the off-site impacts. Two levels of impact were addressed. These include: 1) changes in average daily traffic volumes and the resultant levels of service produced; and 2) intersection levels of service at selected intersections near the site.

### **Daily Traffic Impacts and Lane Requirements**

The daily capacity of streets serving the project were used to determine the number of travel lines for each roadway segment. The capacities were extracted from the City of Patterson General Plan. They were reviewed and found to compare to the Highway Capacity Manual and Caltrans standards. Table 6 details the capacities at level of service "C", "D" and "E" for freeways, expressways and City streets.



**Figure 3**  
**CUMMULATIVE DAILY TRAFFIC**  
**With Lakeborough - Without Project**



**Table 6 - Roadway Capacities by Level of Service  
(Average Daily Traffic Volumes)**

Roadway Type	Peak Hour Level of Service		
	"C"	"D"	"E"
<b>City and Rural Street</b>			
Two-lane	12,000	13,000	15,000
Four-lane	24,000	27,000	30,000
Six-lane	36,000	40,000	45,000
<b>Expressways</b>			
Two-lane	16,000	18,000	20,000
Four-lane	32,000	36,000	40,000
Six-lane	48,000	54,000	60,000
<b>Freeways</b>			
Two-lane	34,000	38,000	40,000
Four-lane	68,000	76,000	80,000
Six-lane	102,000	114,000	120,000

Table 7 details the average daily traffic volumes for various roadway segments affected by the project. The table shows six development scenarios. These include: existing conditions, existing plus project, cumulative without Lakeborough (with and without project), and cumulative with Lakeborough (with and without project). The table reflects the roadway requirements for level of service "C".

The Lakeborough EIR suggests that a portion of the cumulative traffic will include trips generated by Lakeborough. Therefore, some of the roadways show no increase in traffic between the "with and without" Lakeborough development conditions. For the Diablo Grande project, the total increment of project traffic is added to produce a worse case projection. It should be noted however that a portion of the cumulative traffic growth in Patterson and within the I-5 corridor will be associated with the development of Diablo Grande. Therefore, the traffic projections for the project plus cumulative conditions could be overstated.

### Existing Plus Project

Under the existing plus project condition all of the off-site roadways can be maintained without major street widening. Some intersection improvements are required. These are detailed below under the peak hour impacts section.

### Cumulative Without Lakeborough

Along I-5 near the project, the freeway must be widened from 4 to 6 lanes. While it is possible that a portion of the cumulative traffic would include traffic from Diablo Grande, the project traffic was added to the projected cumulative traffic to produce a worse case scenario.

Sperry Road and Las Plamas Roads near Patterson require 2 additional lanes due to the project. Again, the traffic projections for Sperry and Las Plamas Roads in Patterson were taken from the City of Patterson General Plan. As the Diablo Grande project was not included in the cumulative traffic projections, the project was added to the cumulative. It should be noted, however, that if Diablo Grande is approved some of the traffic projected in Patterson would travel to and from Diablo Grande. Thus, the cumulative assessment shown in this EIR is conservative.

The remaining streets can be maintained with the number of lanes required for the cumulative condition without project condition. The project does not produce a demand for more travel lanes.

### Cumulative With Lakeborough

Along I-5, there is a demand for 6 lanes with and without the project. Within Patterson, the project creates the need for two additional travel lanes. Please note the comments regarding the worse case cumulative traffic projections assumed in this EIR. Ward Avenue south of Oak Flat Road requires two additional lanes due to the project. The remaining roadways can be maintained with the number of lanes required under the cumulative plus Lakeborough project traffic condition.

**Table 7 - Travel Lane Requirements - Selected Roadways**

Development Scenarios	Average Daily Traffic	Required Number of Travel Lanes
<b>I-5 North of Sperry Road</b>		
Existing	21,200	2
Existing Plus Project	29,450	2
Cumulative No Lakeborough No Project	60,500	4
Cumulative No Lakeborough With Project	68,750	6
Cumulative With Lakeborough No Project	68,600	6
Cumulative With Lakeborough With Project	76,850	6
<b>I-5 North of Stuhr Road</b>		
Existing	21,200	2
Existing Plus Project	26,200	2
Cumulative No Lakeborough No Project	65,500	4
Cumulative No Lakeborough With Project	70,500	6
Cumulative With Lakeborough No Project	70,600	6
Cumulative With Lakeborough With Project	75,600	6
<b>Sperry Road East of I-5</b>		
Existing	2,800	2
Existing Plus Project	9,040	2
Cumulative No Lakeborough No Project	31,000	6
Cumulative No Lakeborough With Project	37,240	8 <sup>1</sup>
Cumulative With Lakeborough No Project	31,000	6
Cumulative With Lakeborough With Project	37,240	8 <sup>1</sup>
<b>Las Plamas Road East of Highway 33</b>		
Existing	7,550	2
Existing Plus Project	9,750	2
Cumulative No Lakeborough No Project	24,000	4
Cumulative No Lakeborough With Project	26,200	4
Cumulative With Lakeborough No Project	24,000	4
Cumulative With Lakeborough With Project	26,200	4

<sup>1</sup> Traffic volumes are conservative by assuming that none of the Diablo Grande traffic is included in the cumulative traffic projections.

**Table 7 - Travel Lane Requirements - Selected Roadways Continued**

Development Scenarios	Average Daily Traffic	Required Number of Travel Lanes
<b>Ward Avenue South of Sperry Road</b>		
Existing	650	2
Existing Plus Project	10,350	2
Cumulative No Lakeborough No Project	2,700	2
Cumulative No Lakeborough With Project	12,400	4
Cumulative With Lakeborough No Project	8,800	2
Cumulative With Lakeborough With Project	18,500	4
<b>Ward Avenue South of Oak Flat Road</b>		
Existing	390	2
Existing Plus Project	8,290	2
Cumulative No Lakeborough No Project	2,700	2
Cumulative No Lakeborough With Project	10,900	2
Cumulative With Lakeborough No Project	8,800	2
Cumulative With Lakeborough With Project	16,700	4
<b>Marshall Road East of Ward Avenue</b>		
Existing	200	2
Existing Plus Project	1,400	2
Cumulative No Lakeborough No Project	2,000	2
Cumulative No Lakeborough With Project	3,200	2
Cumulative With Lakeborough No Project	2,000	2
Cumulative With Lakeborough With Project	3,200	2
<b>Fink Road East of Ward Avenue</b>		
Existing	1,440	2
Existing Plus Project	6,270	2
Cumulative No Lakeborough No Project	4,750	2
Cumulative No Lakeborough With Project	9,580	2
Cumulative With Lakeborough No Project	16,200	4
Cumulative With Lakeborough With Project	21,030	4

**Table 7 - Travel Lane Requirements - Selected Roadways Continued**

<b>Development Scenarios</b>	<b>Average Daily Traffic</b>	<b>Required Number of Travel Lanes</b>
<b>Stuhr Road East of I-5</b>		
Existing	870	2
Existing Plus Project	2,570	2
Cumulative No Lakeborough No Project	2,700	2
Cumulative No Lakeborough With Project	4,400	2
Cumulative With Lakeborough No Project	9,700	2
Cumulative With Lakeborough With Project	11,400	2
<b>West Main West of Carpenter</b>		
Existing	5,820	2
Existing Plus Project	8,020	2
Cumulative No Lakeborough No Project	13,000	4
Cumulative No Lakeborough With Project	15,200	4
Cumulative With Lakeborough No Project	13,000	4
Cumulative With Lakeborough With Project	15,200	4
<b>Crows Landing Road East of Highway 33</b>		
Existing	6,200	2
Existing Plus Project	10,900	2
Cumulative No Lakeborough No Project	13,750	4
Cumulative No Lakeborough With Project	18,450	4
Cumulative With Lakeborough No Project	25,250	6
Cumulative With Lakeborough With Project	29,950	6
<b>Highway 33outh of Crows Landing Road</b>		
Existing	7,100	2
Existing Plus Project	10,100	2
Cumulative No Lakeborough No Project	10,700	2
Cumulative No Lakeborough With Project	13,700	2
Cumulative With Lakeborough No Project	10,700	2
Cumulative With Lakeborough With Project	13,700	2

**Table 7 - Travel Lane Requirements - Selected Roadways Continued**

Development Scenarios	Average Daily Traffic	Required Number of Travel Lanes
<b>Highway 33 South of Newman</b>		
Existing	7,100	2
Existing Plus Project	7,100	2
Cumulative No Lakeborough No Project	10,600	2
Cumulative No Lakeborough With Project	10,600	2
Cumulative With Lakeborough No Project	14,100	2
Cumulative With Lakeborough With Project	14,100	2
<b>Crows Landing Road North of Marshall Road</b>		
Existing	5,650	2
Existing Plus Project	11,510	2
Cumulative No Lakeborough No Project	18,700	4
Cumulative No Lakeborough With Project	24,560	4
Cumulative With Lakeborough No Project	30,200	6
Cumulative With Lakeborough With Project	36,060	6
<b>Crows Landing Road North of West Main</b>		
Existing	7,600	2
Existing Plus Project	11,450	2
Cumulative No Lakeborough No Project	11,800	2
Cumulative No Lakeborough With Project	15,650	4
Cumulative With Lakeborough No Project	18,100	4
Cumulative With Lakeborough With Project	21,950	4
<b>Crows Landing Road North of Grayson Road</b>		
Existing	8,750	2
Existing Plus Project	12,600	2
Cumulative No Lakeborough No Project	12,400	2
Cumulative No Lakeborough With Project	16,250	4
Cumulative With Lakeborough No Project	18,400	4
Cumulative With Lakeborough With Project	22,250	4

**Table 7 - Travel Lane Requirements - Selected Roadways Continued**

<b>Development Scenarios</b>	<b>Average Daily Traffic</b>	<b>Required Number of Travel Lanes</b>
<b>Carpenter Road North of Crows Landing Road</b>		
Existing	3,140	2
Existing Plus Project	4,460	2
Cumulative No Lakeborough No Project	5,800	2
Cumulative No Lakeborough With Project	7,120	2
Cumulative With Lakeborough No Project	7,900	2
Cumulative With Lakeborough With Project	9,220	2
<b>Carpenter Road North of West Main</b>		
Existing	4,100	2
Existing Plus Project	5,860	2
Cumulative No Lakeborough No Project	13,200	4
Cumulative No Lakeborough With Project	14,950	4
Cumulative With Lakeborough No Project	15,300	4
Cumulative With Lakeborough With Project	17,060	4
<b>Carpenter Road North of Grayson Road</b>		
Existing	5,600	2
Existing Plus Project	7,360	2
Cumulative No Lakeborough No Project	13,500	4
Cumulative No Lakeborough With Project	15,260	4
Cumulative With Lakeborough No Project	17,000	4
Cumulative With Lakeborough With Project	18,760	4

### **Peak Hour Analysis Methodology**

The technical analysis in this report employees the Transportation Research Board, Circular 212 "Planning" method to calculate intersection levels of service (LOS). The Circular 212 method rates the performance of intersections under different development conditions. The new Highway Capacity Method also provides a "planning" methodology for intersection level of service. However, the method calculates level of service in terms of over, near and under capacity rather than the familiar "A" to "F" designations used in the Circular 212 method. To more fully understand the changes in level of service and to address the current County policy of level of service "C" or better for acceptable intersection performance the Circular 212 method was employed.

Peak traffic flows at intersections are regarded as the most important focus in analysis of traffic conditions and the development of adequate traffic management programs. Intersection performance is characterized in terms of "level of service". For signalized intersections, levels of service (LOS) range from "A" to "F", with LOS "A" representing free flow with little or no delay and LOS "F" representing jammed conditions. Generally, levels of service "A" through "C" indicate acceptable conditions at signalized intersections, and level of service "D" is usually considered the lowest acceptable LOS on urban streets.

Table 8 describes the various LOS categories for signalized intersections. At un-signalized intersections, similar level of service grades are assigned, but are calculated and interpreted differently. Levels of service are assigned to individual turning movements. Consequently, it is possible to have one movement operating at level "F", with a heavier main street movement operating at LOS "A", and the intersection as a whole functioning comparatively well. Table 9 describes the level of service criteria for un-signalized intersections.

**Table 8 - Level of Service Definitions  
Signalized Intersections**

Level of Service	Vehicle Delay (seconds)	Volume to Capacity Ratio	Description
A	$\leq 5.00$	0.00 - 0.59	<b>Free Flow/Insignificant Delays:</b> No approach phase is fully utilized by traffic and no vehicle waits longer than one red indication.
B	5.1 - 15.0	0.60 - 0.69	<b>Stable Operation/Minimal Delays:</b> An occasional approach phase is fully utilized. Many drivers begin to feel somewhat restricted within platoons of vehicles.
C	15.1 - 25.0	0.70 - 0.79	<b>Stable Operation/Acceptable Delays:</b> Major approach phases fully utilized. Most drivers feel somewhat restricted.
D	25.1 - 40.0	0.80 - 0.89	<b>Approaching Unstable/Tolerable Delays:</b> Drivers may have to wait through more than one red signal indication. Queues may develop but dissipate rapidly, without excessive delays.
E	40.1 - 60.0	0.90 - 0.99	<b>Unstable Operation/Significant Delays:</b> Volumes at or near capacity. Vehicles may wait through several signal cycles. Long queues form upstream from intersection.
F	$\geq 60$	N/A	<b>Forced Flow/Excessive Delays:</b> Represents jammed conditions. Intersection operates below capacity with low volumes. Queues may block upstream intersections.

**Source:** Highway Capacity Manual, Transportation Research Board, Special Report No. 209, Washington D.C., 1985.

**Table 9 - Level of Service Interpretation  
Un-signalized Intersections**

Level Service	Expected Delay	Reserve Capacity (Vehicles/Hour)
A	Little or no delay	≥ 400
B	Short traffic delays	300 - 399
C	Average traffic delays	200 - 299
D	Long traffic delays	100 - 199
E	Very long traffic delays	0 - 99
F	Extreme delays potentially affecting other traffic movements in the intersection	≤ 0

**Source:** Highway Capacity Manual, Transportation Research Board, Special Report No. 209, Washington D.C., 1985.

### **Peak Hour Traffic Impacts**

The following development conditions were evaluated for the AM and PM peak hours. The Phase 1 development levels for Diablo Grande were evaluated only under the existing plus project condition.

- Existing Conditions
- Existing Plus Phase 1
- Existing Plus Total Project
- Cumulative Without Lakeborough Plus Total Project
- Cumulative With Lakeborough Plus Total Project

For the existing plus project options, the existing street system was used. All traffic from Diablo Grande was assumed to use Oak Flat Road. No provision for secondary access to the site was assumed. For the cumulative conditions, the proposed interchange recommended in the Lakeborough EIR at I-5 and Ward Avenue was assumed. Further, the recommended turning lanes suggested in the Lakeborough EIR were also used. Tables 10 and 11 detail the peak hour levels of service under each development condition.

**Table 10 - Traffic Impacts - Existing Street System  
Peak Hour Levels of Service**

<b>Development Scenario Peak Hour</b>	<b>I-5 SB at Sperry Rd.</b>	<b>I-5 NB at Sperry Rd.</b>	<b>Sperry Rd. at Ward</b>	<b>Ward Ave. Marshall</b>	<b>Ward Ave. Oak Flat</b>	<b>I-5 SB at Fink Road</b>	<b>I-5 NB at Fink Road</b>
<b>Existing Street System Existing 1991 Traffic Levels</b>							
AM Peak - No Project	A	A	A	A	A	A	A
AM Peak - Phase 1 Project	A	A	D	A	C	A	A
PM Peak - No Project	A	A	A	A	A	A	A
PM Peak - Phase 1 Project	B	A	E	C	E	A	A
AM Peak - Total Project	A	A	F	E	F	A	A
PM Peak - Total Project	C	C	F	F	F	A	A

**Table 11 - Traffic Impacts - Existing Street System  
Peak Hour Levels of Service**

Development Scenario Peak Hour	I-5 SB at Sperry Rd.	I-5 NB at Sperry Rd.	Sperry Rd. at Ward	Ward Ave. Marshall	Ward Ave. Oak Flat	I-5 SB at <sup>1</sup> Ward Avenue	I-5 NB at <sup>1</sup> Ward Avenue
<b>Proposed Lakeborough Street System Cumulative Development Without Lakeborough Project</b>							
AM Peak - No Project	F	F	F	C	C	A	A
AM Peak - With Total Project	F	F	F	E	F	A	A
PM Peak - No Project	F	F	F	D	C	A	A
PM Peak - With Total Project	F	F	F	F	F	A	E
<b>Proposed Lakeborough Street System Cumulative Development With Lakeborough Project</b>							
AM Peak - No Project	F	F	F	D	D	B	C
AM Peak - With Total Project	F	F	F	F	F	B	C
PM Peak - No Project	F	F	F	D	D	C	C
PM Peak - With Total Project	F	F	F	F	F	C	F

<sup>1</sup> The Lakeborough EIR proposed a new interchange on I-5 to replace the existing interchange at Fink Road.

Existing Plus Phase 1

The traffic generated by Phase 1 of the project was added to the surrounding street system. Two intersections, Sperry Road and Ward Avenue and Ward Avenue and Oak Flat Road operate at unacceptable levels. These intersections operate at level of service "E" during the PM peak hour. All of the other intersections operate at level of service "B" or better except for Ward Avenue at Marshall Road which operates at level of service "C".

Existing Plus Total Project

When the entire Diablo Grande project traffic is added to the existing street system, three intersections operate at LOS "F". These are: Sperry Road at Ward Avenue; Ward Avenue at Marshall Road and Ward Avenue at Oak Flat Road. Two intersections, I-5 southbound at Sperry Road and I-5 northbound at Sperry Road, operate at LOS "C". The I-5 interchange at Fink Road operates at LOS "A" under all development conditions. This is because the majority of the project traffic is either travelling north on I-5 or destined for areas other than south on I-5.

Cumulative Without Lakeborough Plus Total Project

For all of the cumulative assessment, the recommended mitigation measures suggested in the Lakeborough EIR were assumed constructed. Of these improvements, the only ones that effect Diablo Grande are those associated with the new freeway interchange at Ward Avenue and I-5.

When the cumulative traffic, without Lakeborough, is added to the existing condition, all of the intersections along Sperry Road operate at LOS "F". The Ward Avenue and Marshall Road intersection operates at LOS "D" while the Oak Flat Road and Ward Avenue intersection operates at LOS "C". The remaining intersections operate at LOS "B" or better.

When the project is added, with the exception of the new interchange at Ward Avenue and I-5, all intersections operate at LOS "F". Within the Ward Avenue/I-5 interchange, the southbound off-ramp intersection operates at LOS "A"; however, the northbound off-ramp intersection operates at LOS "E".

Cumulative With Lakeborough Plus Total Project

The addition of the cumulative traffic which includes the Lakeborough project produces LOS "F" conditions along the Sperry Road corridor between I-5 and Ward Avenue. Ward Avenue at Marshall and Oak Flat Roads operate at LOS "D". The new interchange at Ward Avenue and I-5 operates at LOS "C".

When the project is added, the intersections along Ward Avenue at Marshall and Oak Flat Roads operate at LOS "F". Within the new interchange at Ward Avenue and I-5, the northbound off-ramp intersection operates at LOS "F".

### Capacity of Access Roadways

The project includes three access routes. These are: Oak Flat Road to Ward Avenue, access through the Lakeborough development along Crow Creek, and Orestimba Road to I-5. The allocation of peak hour and daily traffic to each of these access routes was based upon professional judgement and the location of the land uses on the site.

As the Diablo Grande project develops, traffic flows will vary substantially between access routes. To address the impacts of the project on each access route, the peak hour capacity of the access routes were determined. The projected levels of traffic for the project was then evaluated relative to these capacities to determine impacts.

The Highway Capacity Manual was used to establish the allowable roadway volumes for each facility. Table 12 details the service flow rates for each type of facility.

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**Table 12 - Roadway Service Volumes at Level of Service "C"**

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#### 2 Lane Rural Highway

Service Volume (two-way hourly volume) = 2,800 (ideal capacity) x .28 (rolling terrain) x .94 (peak hour directional split of traffic x 1.0 (width) x 1.0 (population factor) x .92 (heavy vehicle, 1% truck, 1% RV, 1% bus) = 678 use 700 vehicles per hour two-way.

#### 4 Lane Rural Highway

Service Volume (one-way hourly volume) = 1,150 (maximum flow rate for LOS 'C') x 2 (number of travel lanes) x .95 (rural environmental) x 1.0 (width) x 1.0 (population factor) x .93 (heavy vehicle 1% truck, 1% RV, 1% bus) = 2,032 use 2,050 vehicles per hour per direction (one-way).

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The traffic generated by the Phase 1 and total project development conditions was assigned to the appropriate access roadway. The resultant AM and PM directional and total traffic volumes were compared to the capacities noted above. Table 13 details the results of the analysis. The Phase 1 and total project traffic volumes are shown together with the two-lane and four-lane capacity values. The table notes when the level of service is "C" or worse. For those conditions, the higher roadway standard would be required to maintain acceptable levels of service. For example, about 75 percent of Phase 1 can be constructed before Oak Flat Road must be widened to four lanes. The access

routes through Lakeborough and to I-5 via Orestimba Road can be maintained at two-lanes throughout the total development of the site.

**Table 13 - Access Roadway Impacts**

Development Condition	AM Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total
<b>Phase 1 Development</b>						
<b>Oak Flat Road</b>						
Hourly Volume	210	405	615	532	409	941
Two Lane Capacity			700			700
LOS "C" or worse			No			Yes
Four Lane Capacity	2,050	2,050		2,050	2,050	
LOS "C" or worse	No	No		No	No	
<b>Total Project</b>						
<b>Oak Flat Road</b>						
Hourly Volume	350	561	911	750	626	1,376
Two Lane Capacity			700			700
LOS "C" or worse			Yes			Yes
Four Lane Capacity	2,050	2,050		2,050	2,050	
LOS "C" or worse	No	No		No	No	
<b>Crow Creek Access</b>						
Hourly Volume	143	240	383	348	257	605
Two Lane Capacity			700			700
LOS "C" or worse			No			No
<b>Orestimba Access</b>						
Hourly Volume	94	187	281	245	175	420
Two Lane Capacity			700			700
LOS "C" or worse			No			No

### **Peak Hour Mitigation Measures**

The County of Stanislaus has established a level of service policy of "C" for all traffic mitigation. Therefore, LOS "C" was used as the criteria in developing turn movement and signalization mitigation measures for the intersections evaluated in this report. Tables 14, 15 and 16 detail the recommended mitigation measures for each development scenario. The resultant LOS is also noted.

#### Existing Plus Project

Table 14 details the mitigation measures needed to maintain level of service "C" or better when the project is added to the existing street system operating under existing AM and PM peak hour conditions.

No mitigation measures are needed to maintain LOS "C" or better conditions for the existing condition. When Phase 1 of the project is added, traffic signals are needed at Sperry Road and Ward Avenue and Oak Flat Road and Ward Avenue. No additional turn lanes are needed.

When the full project is added to the existing condition, traffic signals are needed at the I-5 southbound off-ramp intersection at Sperry Road and at Ward Avenue and Marshall Road. Further, additional turn lanes are needed at Ward Avenue and Sperry, Marshall and Oak Flat Roads.

#### Cumulative Without Lakeborough Plus Project

The traffic added to the surrounding street system for the cumulative scenario without Lakeborough is substantial. Most of the growth is due to the build out of the Patterson General Plan. To maintain LOS "C" or better conditions, traffic signals are needed at all intersections except Ward Avenue and Oak Flat Road. Further, additional turn lanes are needed at each intersection that is signalized. Table 15 details the improvement at each location. Additional turn lanes are needed at all intersections along Sperry Road. Also, improvements are required at Ward Avenue and Marshall Road.

When the project is added, additional turn lanes are needed at all intersections except I-5 northbound at Sperry Road and I-5 southbound and Ward Avenue. The turn lanes noted for the intersections at I-5 and Ward Avenue are those recommended in the Lakeborough EIR.

These improvements do not fully mitigate the impacts. A new frontage road is needed which connects Del Puerto Canyon Road and Oak Flat Road if acceptable levels of service are to be maintained. Without the frontage road, major changes to the I-5/Sperry Road interchange are needed. In addition, major improvements, along Sperry Road, at most intersections are needed. Instead of constructing these major improvements, a frontage road to the west of I-5 is recommended.

Cumulative With Lakeborough Plus Project

To maintain LOS "C" or better, traffic signals are required at all of the analysis intersections. Further, additional turn lanes are needed at each intersection. Table 16 details the improvement at each location.

When the project is added to the cumulative, additional turn lanes are needed at Sperry Road and Ward Avenue and Ward Avenue and Marshall and Oak Flat Roads. These improvements do not fully mitigate the impacts. A new frontage road is needed which connects Del Puerto Canyon Road and Oak Flat Road if acceptable levels of service are to be maintained. Without the frontage road, major changes to the I-5/Sperry Road interchange are needed. In addition, major improvements, along Sperry Road, at most intersections are needed. Instead of constructing these major improvements, a frontage road to the west of I-5 is recommended.

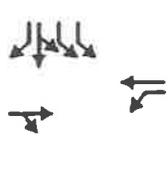
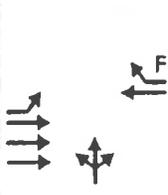
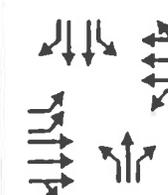
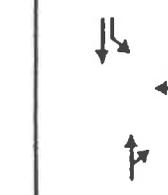
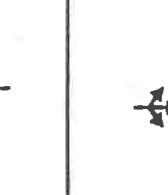
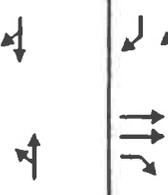
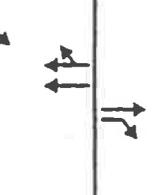
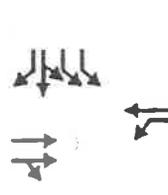
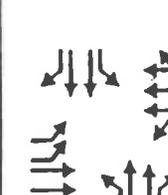
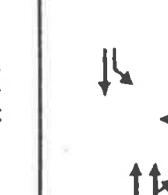
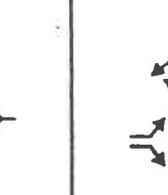
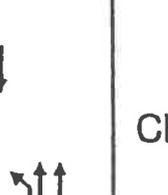
The Patterson Southern Bypass Expressway

The Patterson General Plan recommends the construction of a new southern bypass expressway. The General Plan did not provide peak hour traffic projections for the new facility. Further, the exact location of the road is subject to further study. For the Diablo Grande traffic assessment, all of the cumulative traffic generated at I-5 and Sperry Road was assumed to use the Sperry Road/Ward Avenue intersection. If the bypass is constructed, some of the Diablo Grande traffic which has been assigned to this intersection would be diverted to the expressway. This would reduce the project impacts at Sperry Road and Ward Avenue and therefore produce different turning volumes and resultant turn lane requirements.

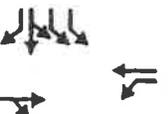
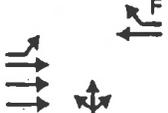
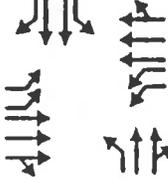
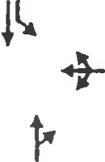
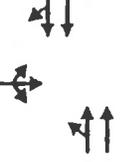
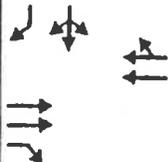
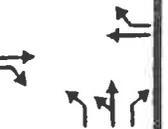
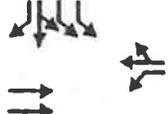
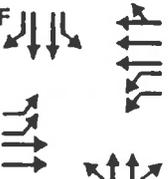
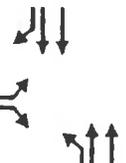
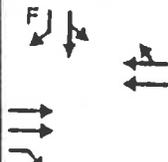
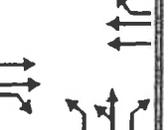
**Table 14 Recommended Mitigation Measures - Existing Plus Project  
Assuming Existing Street System**

Development Scenario	I-5 SB at Sperry Rd.	I-5 NB at Sperry Rd.	Sperry Rd. at Ward Ave.	Ward Ave. at Marshall Rd.	Ward Ave. at Oak Flat Rd.	I-5 SB at Fink Rd.	I-5 NB at Fink Rd.
Existing Condition							
Existing Plus Phase 1 Project	No Change	No Change	Signal C (0.77)	No Change	Signal C (0.72)	No Change	No Change
Existing Plus Total Project	Signal C (0.78)	No Change	 C (0.76)	Signal  C (0.72)	Signal  A (0.47)	No Change	No Change

**Table 15 Recommended Mitigation Measures - Cumulative Without Lakeborough Plus Project**  
 Assuming Existing Street System With Proposed Lakeborough I-5 Interchanges

Development Scenario	I-5 SB at Sperry Rd.	I-5 NB at Sperry Rd.	Sperry Rd. at Ward Ave.	Ward Ave. at Marshall Rd.	Ward Ave. at Oak Flat Rd.	I-5 SB at Ward Rd.	I-5 NB at Ward Rd.
Existing Plus Cumulative Without Lakeborough No Project	Signal  B (0.65)	Signal  C (0.70)	Signal  C (0.75)	Signal  A (0.57)	C  C	Signal  A (0.25)	Signal  A (0.57)
Existing Plus Cumulative Without Lakeborough With Project  <div style="border: 1px solid black; padding: 5px; width: fit-content;">                     Construct Frontage Road Between Oak Flat and Del Puerto Canyon Roads.                 </div>	Signal  C (0.78)	No Change  C (0.77)	Signal  C (0.75)	Signal  B (0.60)	Signal  A (0.59)	No Change  A (0.33)	Signal  C (0.72)

**Table 16 Recommended Mitigation Measures - Cumulative With Lakeborough Plus Project**  
 Assuming Existing Street System With Proposed Lakeborough I-5 Interchanges

Development Scenario	I-5 SB at Sperry Rd.	I-5 NB at Sperry Rd.	Sperry Rd. at Ward Ave.	Ward Ave. at Marshall Rd.	Ward Ave. at Oak Flat Rd.	I-5 SB at Ward Rd.	I-5 NB at Ward Rd.
Existing Plus Cumulative With Lakeborough No Project	Signal  B (0.65)	Signal  C (0.70)	Signal  C (0.75)	Signal  B (0.67)	Signal  A (0.34)	Signal  C (0.76)	Signal  C (0.74)
Existing Plus Cumulative With Lakeborough With Project  <div style="border: 1px solid black; padding: 2px; width: fit-content;">                     Construct Frontage Road Between Oak Flat and Del Puerto Canyon Roads.                 </div>	Signal  C (0.78)	No Change	Signal  C (0.78)	Signal  C (0.77)	Signal  B (0.64)	Signal  B (0.65)	Signal  C (0.72)

### **On-Site Mitigation Measures**

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 will need to be widened to four-lanes at 75 percent build out of Phase 1.
- Oak Flat Road within the site can be four-lanes as shown on the Specific Plan; however, the following traffic control measures should be used.
  - Stop sign controls at all major intersections should be provided on all approaches.
  - Driveway access and egress should be restricted for a distance of at least 100 feet from the curb return tangents at all intersections.
  - All major intersections at the Town Center and Shopping areas should provide for adequate exit storage lane capacity. (Parking lot circulation should be designed to restrict access from parking lot traffic lanes to the exiting street segments to provide any required vehicle storage.)
- Emergency vehicle access should be provided north of Phase 1 to Del Puerto Canyon Road.
- 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 should provide capacity for center two-way left turn lanes and left turn storage lanes at intersection approaches.
- Residential and recreational parking demand should be met off-street with no parking provided along major collector roadways. Parking along minor collectors fronting on residential property can be allowed.
- Consideration should be given to restricting direct driveway access to all major arterial, major collector and minor collector roadways. Back-lot treatments if feasible should be encouraged.

## **Alternatives to the Project**

Four alternatives were considered. These included:

- The No Project alternative
- The General Plan alternative
- The Mitigated Project alternative
- The Off-site alternative

Of these alternatives, the General Plan and Off-site options are discussed below. The General Plan options would provide for 368 residential units. This alternative would generate about 3,500 daily and 270 AM and 370 PM peak hour trips. The traffic impacts along Oak Flat Road generated by this option would be substantially lower than the mitigated project. Oak Flat Road, while upgraded to County standards, could be maintained as a two lane facility. Traffic signals may be needed at Ward Avenue and Oak Flat and Sperry Roads. Without the Lakeborough recommended interchange, the existing interchange, at Fink Road, could serve the General Plan configuration. Signalization may be warranted under cumulative conditions within the I-5/Fink Road interchange.

The Off-site alternative, located on the Simon-Newman Ranch, is expected to produce the same land use plan as the mitigated project. Therefore, the daily and peak hour trip generation will most likely be similar. The access for the project would be via Peter Miller and Sullivan Roads. Peter Miller Road would be a minor access as it does not connect with I-5 but does provide access to Eastin Road to the east of I-5. Sullivan Road would provide the major access as it intersects with I-5. Sparks Road would need to be relocated to the west of its current alignment to accommodate intersection spacing, expanded roadway capacity and intersection turn movement lane improvements within the Sullivan Road interchange. Major traffic impacts will occur along Sullivan and Eastin Roads. Additional impacts would be expected along State Route 140 (Sullivan Road east of I-5), within the community of Gustine and along State Route 33 between Gustine and Crows Landing. Secondary access will be required at Orestimba Road unless Sullivan Road to the west of I-5 can be constructed as a four-lane arterial. Given the configuration of the Simon-Newman Ranch secondary access will most likely be required for police, fire and emergency access to the site.

## **Technical Appendices**

Technical appendices for trip generation calculations, intersection level of service analysis and inputs to the air quality and noise impact analysis can be found in the technical appendix to this report. The County of Stanislaus should be contacted for copies of the appendices.

**SECTION 2**

**SUPPLEMENTAL  
TRAFFIX ASSESSMENT  
for the**

**DIABLO GRANDE  
SPECIFIC PLAN**

**Stanislaus County**

**Conducted By  
Dowling Associates**

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**April 6, 1992**

At the request of Stanislaus County, Dowling Associates is pleased to present the traffic supplement to our draft traffic assessment for the Diablo Grande Specific Plan EIR.

### **Purpose of this supplement**

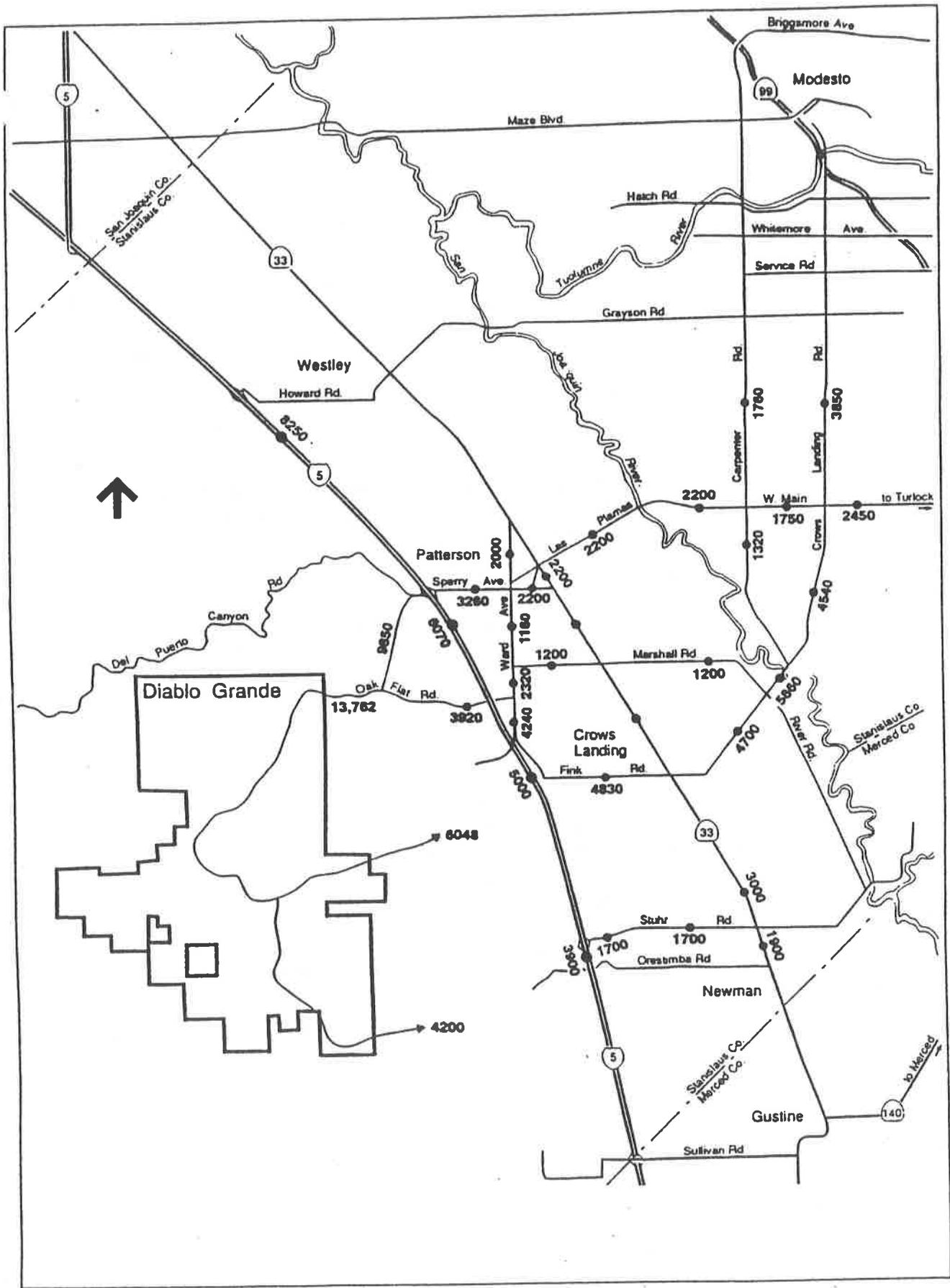
This supplement provides an assessment of the traffic impacts associated with the revised project definition. Specifically, the project definition now provides for a new main access roadway between Oak Flat Road and Del Puerto Canyon Road to the west of the I-5/Sperry Road interchange. Access would still be maintained along Oak Flat Road for travel to other areas in the region. The major traffic movements to north I-5 and Patterson, however, were assumed to use the new frontage road.

This report does not include a complete revision of the former draft traffic study. Rather, the analysis only focuses upon the following intersections:

- I-5 SB at Sperry Road
- I-5 NB at Sperry Road
- Sperry Road at Ward Avenue
- Ward Avenue at Marshall Road
- Ward Avenue at Oak Flat Road

### **Additional analysis**

The lane requirements, recommended in our former draft traffic study, on selected rural highway segments near the project were changed due to a change in the street classification requested by the staff. The basis change reflects a change in the assumptions for the average daily capacity of two-lane rural highways. Specifically, 7,000 vehicles per day rather than 12,000 vehicles per day for rural highway segments was used. The initial draft traffic study applied the urban 12,000 vpd capacity to all of the rural highways serving the site.



Transportation/Circulation	Addition of project traffic would result in unacceptable peak hour levels of service at the following locations: (SM)	
	I-5 SB/Sperry Road	This intersection should be signalized when warranted. Improvements should be made to the southbound approach to provide a shared through-left turn lane, and a right turn lane.
	I-5 NB/Sperry Road	This intersection should be signalized when warranted.
	Addition of project traffic would result in unacceptable peak hour levels of service along the New Main Entrance Road.	New Main Entrance Road should be constructed to 4 lanes.
	Addition of project traffic would result in unacceptable peak hour levels of service along Oak Flat Road west of the New Main Entrance Road	Oak Flat Road west of the New Main Entrance Road should be constructed to 4 lanes.
	Addition of project traffic and cumulative development (including Lakeborough) would result in unacceptable peak hour levels of service at the following locations: (SM)	
	I-5 SB/Sperry Road	The eastbound approach should be improved to provide an additional through lane.
	Addition of project traffic and cumulative development (without Lakeborough) would result in unacceptable peak hour levels of service at the following locations: (SM)	

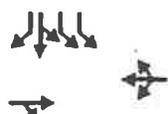
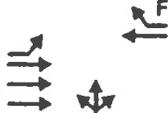
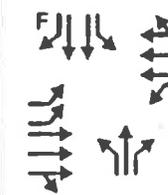
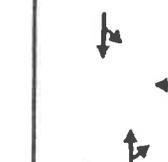
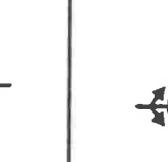
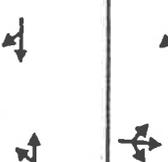
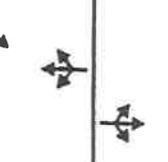
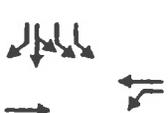
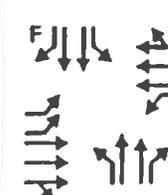
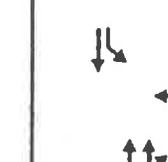
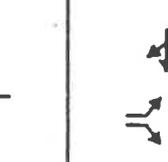
	<b>I-5 SB/Sperry Road</b>	<b>The eastbound and westbound approaches should be improved to provide an additional through lane.</b>
	<b>Sperry Road at Ward Avenue</b>	<b>The northbound approach should be improved to provide an additional through lane.</b>
	<b>Ward Avenue at Marshall Road</b>	<b>The northbound approach should be improved to provide an additional through lane. The southbound approach should be improved to provide a left turn lane.</b>
	<b>Ward Avenue and Oak Flat Road</b>	<b>This intersection should be signalized when warranted. In addition, the northbound and southbound approaches should be improved to provide an additional through lane. Finally, the eastbound approach should be improved to provide a left and right lane.</b>
	<b>I-5 SB at Ward Avenue (or Fink Road if a new interchange is not constructed for cumulative traffic mitigation)</b>	<b>This intersection should be signalized when warranted.</b>
	<b>I-5 NB at Ward Avenue (or Fink Road if a new interchange is not constructed for cumulative traffic mitigation)</b>	<b>This intersection should be signalized when warranted.</b>

The remaining sections of the summary table from the former draft are fine. Changes by LSA may be needed; however, Dowling Associates does not have any modifications. X

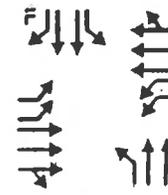
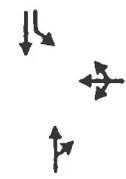
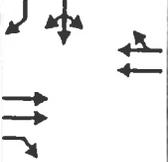
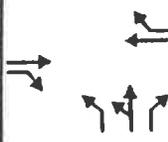
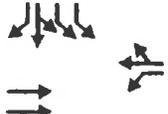
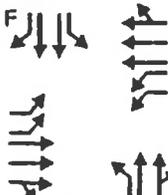
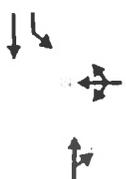
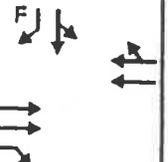
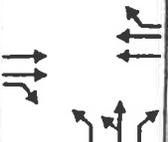
**Table 14 Recommended Mitigation Measures - Existing Plus Project  
Assuming Existing Street System**

Development Scenario	I-5 SB at Sperry Rd.	I-5 NB at Sperry Rd.	Sperry Rd. at Ward Ave.	Ward Ave. at Marshall Rd.	Ward Ave. at Oak Flat Rd.	I-5 SB at Fink Rd.	I-5 NB at Fink Rd.
Existing Condition							
Existing Plus Phase 1 Project	Signal  B (0.67)	No Change	No Change	No Change	No Change	No Change	No Change
Existing Plus Total Project	Signal  C (0.76)	Signal A (0.54)	No Change C	No Change C (0.72)	No Change A (0.47)	No Change	No Change

**Table 15 Recommended Mitigation Measures - Cumulative Without Lakeborough Plus Project**  
 Assuming Existing Street System With Proposed Lakeborough I-5 Interchanges

Development Scenario	I-5 SB at Sperry Rd.	I-5 NB at Sperry Rd.	Sperry Rd. at Ward Ave.	Ward Ave. at Marshall Rd.	Ward Ave. at Oak Flat Rd.	I-5 SB at Ward Rd.	I-5 NB at Ward Rd.
Existing Plus Cumulative Without Lakeborough No Project	Signal  C (0.74)	Signal  C (0.70)	Signal  C (0.75)	Signal  B (0,68)	Signal  C	Signal  A	Signal  B
Existing Plus Cumulative Without Lakeborough With Project	Signal  C (0.78)	No Change	Signal  C (0.75)	Signal  B (0.60)	Signal  A (0.59)	Signal  A (0.57)	Signal  C (0.70)

**Table 16 Recommended Mitigation Measures - Cumulative With Lakeborough Plus Project**  
 Assuming Existing Street System With Proposed Lakeborough I-5 Interchanges

Development Scenario	I-5 SB at Sperry Rd.	I-5 NB at Sperry Rd.	Sperry Rd. at Ward Ave.	Ward Ave. at Marshall Rd.	Ward Ave. at Oak Flat Rd.	I-5 SB at Ward Rd.	I-5 NB at Ward Rd.
Existing Plus Cumulative With Lakeborough No Project	Signal  B (0.65)	Signal  C (0.70)	Signal  C (0.75)	Signal  B (0.66)	Signal  B (0.66)	Signal  C (0.76)	Signal  C (0.76)
Existing Plus Cumulative With Lakeborough With Project	Signal  C (0.78)	Signal  C (0.78)	Signal  C (0.79)	Signal  B (0.68)	Signal  C (0.75)	Signal  B (0.60)	Signal  C (0.79)

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DIABLO GRANDE MASTER PLAN EIR  
Total Project Build out Condition  
Cumulative With Lakeborough - ext\_lb.geo

Link Volume Report

Volume Type	NB Link			SB Link			EB Link			WB Link			Total Volume
	In	Out	Total										
<b>#3</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	4924	4924	9849	0	0	0	0	0	0	4924	4924	9849	19697
Total	4924	4924	9849	0	0	0	0	0	0	4924	4924	9849	19697
<b>#4 Ward Avenue at Sperry Road</b>													
Base	980	780	1760	775	1150	1925	1600	800	2400	745	1370	2115	8200
Added	581	581	1162	982	982	1964	1628	1628	3256	1227	1227	2454	8836
Total	1561	1361	2922	1757	2132	3889	3228	2428	5656	1972	2597	4569	17036
<b>#5 Speery Road at Hwy 33</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	1227	1227	2454	1227	1227	2454	0	0	0	4908
Total	0	0	0	1227	1227	2454	1227	1227	2454	0	0	0	4908
<b>#7</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	2180	2180	4359	1922	1922	3844	965	965	1929	1222	1222	2444	12577
Total	2180	2180	4359	1922	1922	3844	965	965	1929	1222	1222	2444	12577
<b>#8 Ward Avenue at Marshall Road</b>													
Base	970	790	1760	790	970	1760	0	0	0	20	20	40	3560
Added	1178	1178	2357	581	581	1162	0	0	0	597	597	1195	4714
Total	2148	1968	4117	1371	1551	2922	0	0	0	617	617	1235	8274
<b>#9 Ward Avenue at Oak Flat Road</b>													
Base	961	790	1751	790	970	1760	20	11	31	0	0	0	3542
Added	2118	2118	4235	1178	1178	2357	1957	1957	3913	0	0	0	10506
Total	3079	2908	5986	1968	2148	4117	1977	1968	3944	0	0	0	14048
<b>#11 New Acces Road at Oak Flat Road</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	4924	4924	9849	6881	6881	13762	1957	1957	3913	27524
Total	0	0	0	4924	4924	9849	6881	6881	13762	1957	1957	3913	27524
<b>#20</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	3037	3037	6074	1757	1757	3515	1280	0	1280	0	1280	1280	12148
Total	3037	3037	6074	1757	1757	3515	1280	0	1280	0	1280	1280	12148
<b>#22 I-5 NB Ramps at Sperry Road</b>													
Base	405	0	405	0	850	850	1825	270	2095	1065	2175	3240	6590
Added	1280	0	1280	0	2360	2360	3816	2736	6552	1628	1628	3256	13448
Total	1685	0	1685	0	3210	3210	5641	3006	8647	2693	3803	6496	20038

DIABLO GRANDE MASTER PLAN EIR  
 Total Project Build out Condition  
 Cumulative With Lakeborough - ext\_lb.geo

Volume Type	NB Link			SB Link			EB Link			WB Link			Total Volume
	In	Out	Total										
<b>#24 I-5 SB Ramps at Sperry Road</b>													
Base	0	185	185	1840	0	1840	110	210	320	270	1825	2095	4440
Added	0	1280	1280	2360	0	2360	4924	4924	9849	2736	3816	6552	20041
Total	0	1465	1465	4200	0	4200	5034	5134	10169	3006	5641	8647	24481
<b>#26</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	1757	1757	3515	4118	4118	8235	0	2360	2360	2360	0	2360	16470
Total	1757	1757	3515	4118	4118	8235	0	2360	2360	2360	0	2360	16470
<b>#45</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	2487	2487	4974	2000	3037	5037	487	0	487	1037	487	1524	12022
Total	2487	2487	4974	2000	3037	5037	487	0	487	1037	487	1524	12022
<b>#47 I-5 NB Ramps at Ward Avenue</b>													
Base	765	349	1114	0	129	129	782	875	1657	682	876	1558	4458
Added	487	1037	1524	0	0	0	2537	1987	4524	1500	1500	3000	9048
Total	1252	1386	2638	0	129	129	3319	2862	6181	2182	2376	4558	13506
<b>#51 I-5 SB Ramps at Ward Avenue</b>													
Base	0	483	483	1038	219	1257	1021	1450	2471	875	782	1657	5868
Added	0	487	487	1037	0	1037	3024	3024	6048	1987	2537	4524	12096
Total	0	970	970	2075	219	2294	4045	4474	8519	2862	3319	6181	17964
<b>#54 Ward Avenue at Fink Road</b>													
Base	179	177	356	0	0	0	814	568	1382	393	641	1034	2772
Added	2278	2278	4557	0	670	670	3618	830	4448	0	2118	2118	11792
Total	2457	2455	4913	0	670	670	4432	1398	5830	393	2759	3152	14564
<b>#56 Ward Avenue at Fink Road</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	2278	2278	4557	0	0	0	2278	2278	4557	9113
Total	0	0	0	2278	2278	4557	0	0	0	2278	2278	4557	9113
<b>#59</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>#63</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>#68</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	1488	1488	2976	0	0	0	2278	2278	4557	2197	2197	4395	11927
Total	1488	1488	2976	0	0	0	2278	2278	4557	2197	2197	4395	11927

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DIABLO GRANDE MASTER PLAN EIR  
Total Project Build out Condition  
Cumulative With Lakeborough - ext\_lb.geo

Volume Type	NB Link			SB Link			EB Link			WB Link			Total Volume
	In	Out	Total										
<b>#69</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	597	597	1195	2197	2197	4395	2795	2795	5589	11179
Total	0	0	0	597	597	1195	2197	2197	4395	2795	2795	5589	11179
<b>#73</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>#77</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>#82 I-5 SB Ramps at Stuhr Road</b>													
Base	0	10	10	60	0	60	0	0	0	10	60	70	140
Added	0	338	338	892	0	892	2100	2100	4200	1208	1762	2970	8400
Total	0	348	348	952	0	952	2100	2100	4200	1218	1822	3040	8540
<b>#84</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	1933	1933	3866	1595	1595	3190	338	0	338	0	338	338	7731
Total	1933	1933	3866	1595	1595	3190	338	0	338	0	338	338	7731
<b>#86 I-5 NB Ramps at Stuhr Road</b>													
Base	20	0	20	0	30	30	60	30	90	40	60	100	240
Added	338	0	338	0	892	892	1762	1208	2970	870	870	1740	5940
Total	358	0	358	0	922	922	1822	1238	3060	910	930	1840	6180
<b>#94 Las Palmas Road at Hwy 33</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	1227	1227	2454	0	0	0	0	0	0	1227	1227	2454	4908
Total	1227	1227	2454	0	0	0	0	0	0	1227	1227	2454	4908
<b>#95</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	615	615	1230	878	878	1755	1227	1227	2454	965	965	1929	7369
Total	615	615	1230	878	878	1755	1227	1227	2454	965	965	1929	7369
<b>#96</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	982	982	1964	982	982	1964	0	0	0	0	0	0	3928
Total	982	982	1964	982	982	1964	0	0	0	0	0	0	3928

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DIABLO GRANDE MASTER PLAN EIR  
Total Project Build out Condition  
Cumulative With Lakeborough - ext\_lb.geo  
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Volume Type	NB Link			SB Link			EB Link			WB Link			Total Volume
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
#97													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	951	951	1902	1488	1488	2976	870	870	1740	0	0	0	6617
Total	951	951	1902	1488	1488	2976	870	870	1740	0	0	0	6617

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DIABLO GRANDE MASTER PLAN EIR  
AM Peak Hour Phase 1 - Revised Access  
exist.geo

Trip Generation Report  
ampk\_ph1.GEN  
Forecast for

Zone #	Subzone	Amount	Units	Rate In	Rate Out	Trips In	Trips Out	Total Trips	% Of Total
1		572.00	Daily Work	0.29	0.71	166	406	572	93.0
1		0.00		0.00	0.00	0	0	0	0.0
	Zone 1 Subtotal					166	406	572	93.0
2		43.00	Daily Other	1.00	0.00	43	0	43	7.0
2		0.00		0.00	0.00	0	0	0	0.0
	Zone 2 Subtotal					43	0	43	7.0
6		0.00	Daily Work	0.13	0.13	0	0	0	0.0
8		0.00	Daily Work	0.13	0.13	0	0	0	0.0
9		0.00	Daily Other	0.37	0.37	0	0	0	0.0
12		0.00	Daily Other	0.37	0.37	0	0	0	0.0
<b>TOTAL</b>						<b>209</b>	<b>406</b>	<b>615</b>	<b>100.0</b>

DIABLO GRANDE MASTER PLAN EIR  
AM Peak Hour Phase 1 - Revised Access  
exist.geo

Link Volume Report

Volume Type	NB Link			SB Link			EB Link			WB Link			Total Volume
	In	Out	Total										
<b>#3</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	367	178	546	0	0	0	0	0	0	178	367	546	1091
Total	367	178	546	0	0	0	0	0	0	178	367	546	1091
<b>#4 Ward Avenue at Sperry Road</b>													
Base	15	15	30	72	20	92	44	187	231	130	39	169	522
Added	0	0	0	9	12	21	43	28	71	19	30	49	142
Total	15	15	30	81	32	113	87	215	302	149	69	218	664
<b>#5 Speery Road at Hwy 33</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	19	30	49	30	19	49	0	0	0	99
Total	0	0	0	19	30	49	30	19	49	0	0	0	99
<b>#7</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	30	21	51	21	30	51	20	13	34	13	20	34	170
Total	30	21	51	21	30	51	20	13	34	13	20	34	170
<b>#8 Ward Avenue at Marshall Road</b>													
Base	25	25	50	25	25	50	0	0	0	10	10	20	120
Added	0	4	4	0	0	0	0	0	0	4	0	4	9
Total	25	29	54	25	25	50	0	0	0	14	10	24	129
<b>#9 Ward Avenue at Oak Flat Road</b>													
Base	25	25	50	25	25	50	10	10	20	0	0	0	120
Added	27	39	65	4	0	4	39	31	69	0	0	0	139
Total	52	64	115	29	25	54	49	41	89	0	0	0	259
<b>#11 New Acces Road at Oak Flat Road</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	178	367	546	406	209	615	31	39	69	1230
Total	0	0	0	178	367	546	406	209	615	31	39	69	1230
<b>#20</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	17	20	37	0	0	0	20	0	20	0	17	17	74
Total	17	20	37	0	0	0	20	0	20	0	17	17	74
<b>#22 1-5 NB Ramps at Sperry Road</b>													
Base	7	0	7	0	177	177	39	12	51	187	44	231	466
Added	17	0	17	0	305	305	347	45	392	28	43	71	784
Total	24	0	24	0	482	482	386	57	443	215	87	302	1250

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DIABLO GRANDE MASTER PLAN EIR  
AM Peak Hour Phase 1 - Revised Access  
exist.geo

Volume Type	NB Link			SB Link			EB Link			WB Link			Total Volume
	In	Out	Total										
<b>#24 I-5 SB Ramps at Sperry Road</b>													
Base	0	7	7	35	0	35	6	13	19	18	39	57	118
Added	0	20	20	133	0	133	367	178	546	45	347	392	1091
Total	0	27	27	168	0	168	373	191	565	63	386	449	1209
<b>#26</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	133	305	438	0	133	133	305	0	305	875
Total	0	0	0	133	305	438	0	133	133	305	0	305	875
<b>#45</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	17	20	37	20	17	37	0	0	0	0	0	0	74
Total	17	20	37	20	17	37	0	0	0	0	0	0	74
<b>#47 I-5 NB Ramps at Ward Avenue</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>#51 I-5 SB Ramps at Ward Avenue</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>#56 Ward Avenue at Fink Road</b>													
Base	0	0	0	10	10	20	25	25	50	25	25	50	120
Added	0	0	0	39	27	65	0	0	0	27	39	65	130
Total	0	0	0	49	37	85	25	25	50	52	64	115	250
<b>#59</b>													
Base	0	5	5	20	0	20	0	0	0	5	20	25	50
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	5	5	20	0	20	0	0	0	5	20	25	50
<b>#63</b>													
Base	5	0	5	0	20	20	20	10	30	25	20	45	100
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	5	0	5	0	20	20	20	10	30	25	20	45	100
<b>#68</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	8	8	16	0	0	0	39	27	65	19	30	49	130
Total	8	8	16	0	0	0	39	27	65	19	30	49	130
<b>#69</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	4	4	30	19	49	23	30	54	107
Total	0	0	0	0	4	4	30	19	49	23	30	54	107

AMEXT\_P1.CMD

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DIABLO GRANDE MASTER PLAN EIR  
AM Peak Hour Phase 1 - Revised Access  
exist.geo

Volume Type	NB Link			SB Link			EB Link			WB Link			Total Volume
	In	Out	Total										
<b>#73</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>#77</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>#82 I-5 SB Ramps at Stuhr Road</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>#84</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	17	20	37	20	17	37	0	0	0	0	0	0	74
Total	17	20	37	20	17	37	0	0	0	0	0	0	74
<b>#86 I-5 NB Ramps at Stuhr Road</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>#94 Las Palmas Road at Hwy 33</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	30	19	49	0	0	0	0	0	0	19	30	49	99
Total	30	19	49	0	0	0	0	0	0	19	30	49	99
<b>#95</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	3	3	8	10	18	30	19	49	13	20	34	104
Total	0	3	3	8	10	18	30	19	49	13	20	34	104
<b>#96</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	12	9	21	9	12	21	0	0	0	0	0	0	43
Total	12	9	21	9	12	21	0	0	0	0	0	0	43
<b>#97</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	8	8	16	8	8	16	0	0	0	0	0	0	31
Total	8	8	16	8	8	16	0	0	0	0	0	0	31

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DIABLO GRANDE MASTER PLAN EIR  
AM Peak Hour Phase 1 - Revised Access  
exist.geo

Impact Analysis Report  
Level Of Service

Intersection	Base			Future			Change in
	LOS	Del/ Veh	V/ C	LOS	Del/ Veh	V/ C	
# 4 Ward Avenue at Sperry Road	A	0.0	0.000	A	0.0	0.000	+ 0.000 V/C
# 8 Ward Avenue at Marshall Road	A	0.0	0.000	A	0.0	0.000	+ 0.000 V/C
# 9 Ward Avenue at Oak Flat Road	A	0.0	0.000	A	0.0	0.000	+ 0.000 V/C
# 11 New Acces Road at Oak Flat Roa		0.0	0.000	A	12.9	0.447	+ 0.447 V/C
# 22 I-5 NB Ramps at Sperry Road	A	0.0	0.000	B	0.0	0.000	+ 0.000 V/C
# 24 I-5 SB Ramps at Sperry Road	A	0.0	0.000	A	0.0	0.000	+ 0.000 V/C
# 47 I-5 NB Ramps at Ward Avenue		0.0	0.000		0.0	0.000	+ 0.000 V/C
# 51 I-5 SB Ramps at Ward Avenue		0.0	0.000		0.0	0.000	+ 0.000 V/C
# 82 I-5 SB Ramps at Stuhr Road		0.0	0.000		0.0	0.000	+ 0.000 V/C
# 86 I-5 NB Ramps at Stuhr Road		0.0	0.000		0.0	0.000	+ 0.000 V/C

ANEXT\_MP.DMD

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DIABLO GRANDE MASTER PLAN EIR  
AM Peak Hour Total Project - Revised Access  
exist.geo

Trip Generation Report  
ampk\_tot.GEN  
Forecast for

Zone #	Subzone	Amount	Units	Rate In	Rate Out	Trips In	Trips Out	Total Trips	% Of Total
1		722.00	Daily Work	0.22	0.78	159	563	722	45.8
1		0.00		0.00	0.00	0	0	0	0.0
	Zone 1 Subtotal					159	563	722	45.8
2		189.00	Daily Other	1.00	0.00	189	0	189	12.0
2		0.00		0.00	0.00	0	0	0	0.0
	Zone 2 Subtotal					189	0	189	12.0
6		383.00	Daily Work	0.37	0.63	142	241	383	24.3
	Zone 6 Subtotal					142	241	383	24.3
8		281.00	Daily Work	0.33	0.67	93	188	281	17.8
	Zone 8 Subtotal					93	188	281	17.8
9		0.00	Daily Other	0.37	0.37	0	0	0	0.0
12		0.00	Daily Other	0.37	0.37	0	0	0	0.0
<b>TOTAL</b>						<b>583</b>	<b>992</b>	<b>1575</b>	<b>100.0</b>

DIABLO GRANDE MASTER PLAN EIR  
AM Peak Hour Total Project - Revised Access  
exist.geo

Link Volume Report

Volume Type	NB Link			SB Link			EB Link			WB Link			Total Volume
	In	Out	Total										
<b>#3</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	510	267	776	0	0	0	0	0	0	267	510	776	1552
Total	510	267	776	0	0	0	0	0	0	267	510	776	1552
<b>#4 Ward Avenue at Sperry Road</b>													
Base	15	15	30	72	20	92	44	187	231	130	39	169	522
Added	7	4	11	31	30	60	65	67	131	40	42	82	286
Total	22	19	41	103	50	152	109	254	362	170	81	251	808
<b>#5 Sperry Road at Hwy 33</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	40	42	82	42	40	82	0	0	0	165
Total	0	0	0	40	42	82	42	40	82	0	0	0	165
<b>#7</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	96	77	173	65	74	140	28	31	59	42	50	92	464
Total	96	77	173	65	74	140	28	31	59	42	50	92	464
<b>#8 Ward Avenue at Marshall Road</b>													
Base	25	25	50	25	25	50	0	0	0	10	10	20	120
Added	7	23	30	4	7	11	0	0	0	19	0	19	61
Total	32	48	80	29	32	61	0	0	0	29	10	39	181
<b>#9 Ward Avenue at Oak Flat Road</b>													
Base	25	25	50	25	25	50	10	10	20	0	0	0	120
Added	70	58	128	23	7	30	53	81	135	0	0	0	293
Total	95	83	178	48	32	80	63	91	155	0	0	0	413
<b>#11 New Acces Road at Oak Flat Road</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	267	510	776	563	348	911	81	53	135	1822
Total	0	0	0	267	510	776	563	348	911	81	53	135	1822
<b>#20</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	373	207	580	176	322	498	31	0	31	0	51	51	1161
Total	373	207	580	176	322	498	31	0	31	0	51	51	1161
<b>#22 I-5 NB Ramps at Sperry Road</b>													
Base	7	0	7	0	177	177	39	12	51	187	44	231	466
Added	51	0	51	0	422	422	481	112	594	67	65	131	1199
Total	58	0	58	0	599	599	520	124	645	254	109	362	1665

DIABLO GRANDE MASTER PLAN EIR  
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Volume Type	NB Link			SB Link			EB Link			WB Link			Total Volume
	In	Out	Total										
<b>#24 1-5 SB Ramps at Sperry Road</b>													
Base	0	7	7	35	0	35	6	13	19	18	39	57	118
Added	0	31	31	157	0	157	510	267	776	112	481	594	1558
Total	0	38	38	192	0	192	516	280	795	130	520	651	1676
<b>#26</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	322	176	498	333	744	1077	0	157	157	422	0	422	2155
Total	322	176	498	333	744	1077	0	157	157	422	0	422	2155
<b>#45</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	199	113	312	101	373	474	12	0	12	181	7	188	986
Total	199	113	312	101	373	474	12	0	12	181	7	188	986
<b>#47 1-5 NB Ramps at Ward Avenue</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	7	181	188	0	0	0	229	36	264	28	48	77	529
Total	7	181	188	0	0	0	229	36	264	28	48	77	529
<b>#51 1-5 SB Ramps at Ward Avenue</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	12	12	107	0	107	241	142	383	36	229	264	766
Total	0	12	12	107	0	107	241	142	383	36	229	264	766
<b>#56 Ward Avenue at Fink Road</b>													
Base	0	0	0	10	10	20	25	25	50	25	25	50	120
Added	0	0	0	94	87	181	0	0	0	87	94	181	362
Total	0	0	0	104	97	201	25	25	50	112	119	231	482
<b>#59</b>													
Base	0	5	5	20	0	20	0	0	0	5	20	25	50
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	5	5	20	0	20	0	0	0	5	20	25	50
<b>#63</b>													
Base	5	0	5	0	20	20	20	10	30	25	20	45	100
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	5	0	5	0	20	20	20	10	30	25	20	45	100
<b>#68</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	53	30	83	0	0	0	94	87	181	76	107	182	447
Total	53	30	83	0	0	0	94	87	181	76	107	182	447
<b>#69</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	19	19	107	76	182	95	107	201	402
Total	0	0	0	0	19	19	107	76	182	95	107	201	402

DIABLO GRANDE MASTER PLAN EIR  
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exist.geo

Volume Type	NB Link			SB Link			EB Link			WB Link			Total Volume
	In	Out	Total										
<b>#73</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>#77</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>#82 I-5 SB Ramps at Stuhr Road</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	9	9	73	0	73	188	93	281	20	179	199	562
Total	0	9	9	73	0	73	188	93	281	20	179	199	562
<b>#84</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	58	50	107	40	53	93	9	0	9	0	5	5	214
Total	58	50	107	40	53	93	9	0	9	0	5	5	214
<b>#86 I-5 NB Ramps at Stuhr Road</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	5	0	5	0	147	147	179	20	199	16	32	48	398
Total	5	0	5	0	147	147	179	20	199	16	32	48	398
<b>#94 Las Palmas Road at Hwy 33</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	42	40	82	0	0	0	0	0	0	40	42	82	165
Total	42	40	82	0	0	0	0	0	0	40	42	82	165
<b>#95</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	11	17	28	27	25	52	42	40	82	31	28	59	221
Total	11	17	28	27	25	52	42	40	82	31	28	59	221
<b>#96</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	30	31	60	31	30	60	0	0	0	0	0	0	121
Total	30	31	60	31	30	60	0	0	0	0	0	0	121
<b>#97</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	27	20	47	30	53	83	32	16	48	0	0	0	178
Total	27	20	47	30	53	83	32	16	48	0	0	0	178

AMEXT\_UP.CMD

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DIABLO GRANDE MASTER PLAN EIR  
AM Peak Hour Total Project - Revised Access  
exist.geo

Impact Analysis Report  
Level Of Service

Intersection	Base			Future			Change in
	LOS	Del/ Veh	V/ C	LOS	Del/ Veh	V/ C	
# 4 Ward Avenue at Sperry Road	A	0.0	0.000	A	0.0	0.000	+ 0.000 V/C
# 8 Ward Avenue at Marshall Road	A	0.0	0.000	A	0.0	0.000	+ 0.000 V/C
# 9 Ward Avenue at Oak Flat Road	A	0.0	0.000	A	0.0	0.000	+ 0.000 V/C
# 11 New Acces Road at Oak Flat Roa		0.0	0.000	B	18.4	0.663	+ 0.663 V/C
# 22 I-5 NB Ramps at Sperry Road	A	0.0	0.000	D	0.0	0.000	+ 0.000 V/C
# 24 I-5 SB Ramps at Sperry Road	A	0.0	0.000	A	0.0	0.000	+ 0.000 V/C
# 47 I-5 NB Ramps at Ward Avenue		0.0	0.000	A	1.0	0.172	+ 0.172 V/C
# 51 I-5 SB Ramps at Ward Avenue		0.0	0.000	A	8.7	0.253	+ 0.253 V/C
# 82 I-5 SB Ramps at Stuhr Road		0.0	0.000	A	8.0	0.189	+ 0.189 V/C
# 86 I-5 NB Ramps at Stuhr Road		0.0	0.000	A	3.8	0.145	+ 0.145 V/C

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DIABLO GRANDE MASTER PLAN EIR  
PM Peak Hour Phase 1 - Revised Access  
exist.geo

Trip Generation Report  
pmpk\_ph1.GEN  
Forecast for

Zone #	Subzone	Amount	Units	Rate In	Rate Out	Trips In	Trips Out	Total Trips	% Of Total
1		778.00	Daily Work	0.62	0.38	482	296	778	82.7
1		0.00		0.00	0.00	0	0	0	0.0
	Zone 1 Subtotal					482	296	778	82.7
2		163.00	Daily Other	0.32	0.68	52	111	163	17.3
2		0.00		0.00	0.00	0	0	0	0.0
	Zone 2 Subtotal					52	111	163	17.3
6		0.00	Daily Work	0.13	0.13	0	0	0	0.0
8		0.00	Daily Work	0.13	0.13	0	0	0	0.0
9		0.00	Daily Other	0.37	0.37	0	0	0	0.0
12		0.00	Daily Other	0.37	0.37	0	0	0	0.0
<b>TOTAL</b>						<b>534</b>	<b>407</b>	<b>941</b>	<b>100.0</b>

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 DIABLO GRANDE MASTER PLAN EIR  
 PM Peak Hour Phase 1 - Revised Access  
 exist.geo  
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Link Volume Report

Volume Type	NB Link			SB Link			EB Link			WB Link			Total Volume
	In	Out	Total										
<b>#3</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	340	470	810	0	0	0	0	0	0	470	340	810	1620
Total	340	470	810	0	0	0	0	0	0	470	340	810	1620
<b>#4 Ward Avenue at Sperry Road</b>													
Base	15	35	50	25	30	55	192	49	241	44	162	206	552
Added	0	0	0	20	20	40	59	64	122	44	39	83	245
Total	15	35	50	45	50	95	251	113	363	88	201	289	797
<b>#5 Sperry Road at Hwy 33</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	44	39	83	39	44	83	0	0	0	165
Total	0	0	0	44	39	83	39	44	83	0	0	0	165
<b>#7</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	43	46	89	46	43	89	28	30	58	30	28	58	296
Total	43	46	89	46	43	89	28	30	58	30	28	58	296
<b>#8 Ward Avenue at Marshall Road</b>													
Base	25	25	50	25	25	50	0	0	0	10	10	20	120
Added	11	5	16	0	0	0	0	0	0	5	11	16	33
Total	36	30	66	25	25	50	0	0	0	15	21	36	153
<b>#9 Ward Avenue at Oak Flat Road</b>													
Base	20	25	45	20	25	45	10	0	10	0	0	0	100
Added	59	56	115	5	11	16	67	64	131	0	0	0	262
Total	79	81	160	25	36	61	77	64	141	0	0	0	362
<b>#11 New Acces Road at Oak Flat Road</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	470	340	810	407	534	941	64	67	131	1882
Total	0	0	0	470	340	810	407	534	941	64	67	131	1882
<b>#20</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	35	37	72	0	0	0	37	0	37	0	35	35	143
Total	35	37	72	0	0	0	37	0	37	0	35	35	143
<b>#22 I-5 NB Ramps at Sperry Road</b>													
Base	7	0	7	0	35	35	187	11	198	44	192	236	476
Added	35	0	35	0	244	244	303	98	401	64	59	122	802
Total	42	0	42	0	279	279	490	109	599	108	251	358	1278

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DIABLO GRANDE MASTER PLAN EIR  
PM Peak Hour Phase 1 - Revised Access  
exist.geo

Volume Type	NB Link			SB Link			EB Link			WB Link			Total Volume
	In	Out	Total										
<b>#73</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>#77</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>#82 1-5 SB Ramps at Stuhr Road</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>#84</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	35	37	72	37	35	72	0	0	0	0	0	0	143
Total	35	37	72	37	35	72	0	0	0	0	0	0	143
<b>#86 1-5 NB Ramps at Stuhr Road</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>#94 Las Palmas Road at Hwy 33</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	39	44	83	0	0	0	0	0	0	44	39	83	165
Total	39	44	83	0	0	0	0	0	0	44	39	83	165
<b>#95</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	7	3	10	17	17	34	39	44	83	30	28	58	185
Total	7	3	10	17	17	34	39	44	83	30	28	58	185
<b>#96</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	20	20	40	20	20	40	0	0	0	0	0	0	79
Total	20	20	40	20	20	40	0	0	0	0	0	0	79
<b>#97</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	15	17	32	17	15	32	0	0	0	0	0	0	64
Total	15	17	32	17	15	32	0	0	0	0	0	0	64

PNEXT\_P1.CMD

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DIABLO GRANDE MASTER PLAN EIR  
PM Peak Hour Phase 1 - Revised Access  
exist.geo

Impact Analysis Report  
Level Of Service

Intersection	Base			Future			Change in
	LOS	Del/ Veh	V/ C	LOS	Del/ Veh	V/ C	
# 4 Ward Avenue at Sperry Road	A	0.0	0.000	A	0.0	0.000	+ 0.000 V/C
# 8 Ward Avenue at Marshall Road	A	0.0	0.000	A	0.0	0.000	+ 0.000 V/C
# 9 Ward Avenue at Oak Flat Road	A	0.0	0.000	A	0.0	0.000	+ 0.000 V/C
# 11 New Acces Road at Oak Flat Road		0.0	0.000	B	20.2	0.684	+ 0.684 V/C
# 22 1-5 NB Ramps at Sperry Road	A	0.0	0.000	B	0.0	0.000	+ 0.000 V/C
# 24 1-5 SB Ramps at Sperry Road	A	0.0	0.000	D	0.0	0.000	+ 0.000 V/C
# 47 1-5 NB Ramps at Ward Avenue		0.0	0.000		0.0	0.000	+ 0.000 V/C
# 51 1-5 SB Ramps at Ward Avenue		0.0	0.000		0.0	0.000	+ 0.000 V/C
# 82 1-5 SB Ramps at Stuhr Road		0.0	0.000		0.0	0.000	+ 0.000 V/C
# 86 1-5 NB Ramps at Stuhr Road		0.0	0.000		0.0	0.000	+ 0.000 V/C

PWEXT\_MP.CMD

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DIABLO GRANDE MASTER PLAN EIR  
PM Peak Hour Total Project - Revised Access  
exist.geo

Trip Generation Report  
pmpk\_tot.GEN  
Forecast for

Zone #	Subzone	Amount	Units	Rate In	Rate Out	Trips In	Trips Out	Total Trips	% Of Total
1		859.00	Daily Work	0.67	0.33	576	283	859	35.8
1		0.00		0.00	0.00	0	0	0	0.0
	Zone 1 Subtotal					576	283	859	35.8
2		517.00	Daily Other	0.33	0.67	171	346	517	21.5
2		0.00		0.00	0.00	0	0	0	0.0
	Zone 2 Subtotal					171	346	517	21.5
6		605.00	Daily Work	0.58	0.42	351	254	605	25.2
	Zone 6 Subtotal					351	254	605	25.2
8		420.00	Daily Work	0.58	0.42	244	176	420	17.5
	Zone 8 Subtotal					244	176	420	17.5
9		0.00	Daily Other	0.37	0.37	0	0	0	0.0
12		0.00	Daily Other	0.37	0.37	0	0	0	0.0
<b>TOTAL</b>						<b>1342</b>	<b>1059</b>	<b>2401</b>	<b>100.0</b>

DIABLO GRANDE MASTER PLAN EIR  
PM Peak Hour Total Project - Revised Access  
exist.geo

Link Volume Report

Volume Type	NB Link			SB Link			EB Link			WB Link			Total Volume
	In	Out	Total										
<b>#3</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	481	632	1113	0	0	0	0	0	0	632	481	1113	2226
Total	481	632	1113	0	0	0	0	0	0	632	481	1113	2226
<b>#4 Ward Avenue at Sperry Road</b>													
Base	15	35	50	25	30	55	192	49	241	44	162	206	552
Added	8	11	18	52	56	108	121	110	232	69	73	142	499
Total	23	46	68	77	86	163	313	159	473	113	235	348	1051
<b>#5 Speery Road at Hwy 33</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	69	73	142	73	69	142	0	0	0	283
Total	0	0	0	69	73	142	73	69	142	0	0	0	283
<b>#7</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	141	150	291	120	119	240	55	49	105	79	77	156	792
Total	141	150	291	120	119	240	55	49	105	79	77	156	792
<b>#8 Ward Avenue at Marshall Road</b>													
Base	25	25	50	25	25	50	0	0	0	10	10	20	120
Added	42	28	70	11	8	18	0	0	0	17	35	52	140
Total	67	53	120	36	33	68	0	0	0	27	45	72	260
<b>#9 Ward Avenue at Oak Flat Road</b>													
Base	20	25	45	20	25	45	10	0	10	0	0	0	100
Added	105	124	230	28	42	70	148	115	263	0	0	0	562
Total	125	149	275	48	67	115	158	115	273	0	0	0	662
<b>#11 New Acces Road at Oak Flat Road</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	632	481	1113	629	747	1376	115	148	263	2752
Total	0	0	0	632	481	1113	629	747	1376	115	148	263	2752
<b>#20</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	391	537	928	446	323	769	91	0	91	0	68	68	1855
Total	391	537	928	446	323	769	91	0	91	0	68	68	1855
<b>#22 I-5 NB Ramps at Sperry Road</b>													
Base	7	0	7	0	35	35	187	11	198	44	192	236	476
Added	68	0	68	0	281	281	397	173	571	110	121	232	1152
Total	75	0	75	0	316	316	584	184	769	154	313	468	1628

PNEXT\_LP.CHD

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DIABLO GRANDE MASTER PLAN EIR  
PM Peak Hour Total Project - Revised Access  
exist.geo

Volume Type	NB Link			SB Link			EB Link			WB Link			Total Volume
	In	Out	Total										
<b>#24 1-5 SB Ramps at Sperry Road</b>													
Base	0	7	7	177	0	177	12	6	18	11	187	198	400
Added	0	91	91	466	0	466	481	632	1113	173	397	571	2241
Total	0	98	98	643	0	643	493	638	1131	184	584	769	2641
<b>#26</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	323	446	769	912	604	1516	0	466	466	281	0	281	3033
Total	323	446	769	912	604	1516	0	466	466	281	0	281	3033
<b>#45</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	218	286	504	274	391	664	13	0	13	191	18	208	1389
Total	218	286	504	274	391	664	13	0	13	191	18	208	1389
<b>#47 1-5 NB Ramps at Ward Avenue</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	18	191	208	0	0	0	241	88	329	70	51	121	658
Total	18	191	208	0	0	0	241	88	329	70	51	121	658
<b>#51 1-5 SB Ramps at Ward Avenue</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	13	13	263	0	263	254	351	605	88	241	329	1210
Total	0	13	13	263	0	263	254	351	605	88	241	329	1210
<b>#56 Ward Avenue at Fink Road</b>													
Base	0	0	0	10	10	20	25	25	50	25	25	50	120
Added	0	0	0	157	157	314	0	0	0	157	157	314	628
Total	0	0	0	167	167	334	25	25	50	182	182	364	748
<b>#59</b>													
Base	0	5	5	20	0	20	0	0	0	5	20	25	50
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	5	5	20	0	20	0	0	0	5	20	25	50
<b>#63</b>													
Base	5	0	5	0	20	20	20	10	30	25	20	45	100
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	5	0	5	0	20	20	20	10	30	25	20	45	100
<b>#68</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	62	82	144	0	0	0	157	157	314	158	138	296	754
Total	62	82	144	0	0	0	157	157	314	158	138	296	754
<b>#69</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	35	17	52	138	158	296	175	173	348	696
Total	0	0	0	35	17	52	138	158	296	175	173	348	696

DIABLO GRANDE MASTER PLAN EIR  
PM Peak Hour Total Project - Revised Access  
exist.geo

Volume Type	NB Link			SB Link			EB Link			WB Link			Total Volume
	In	Out	Total										
<b>#73</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>#77</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>#82 I-5 SB Ramps at Stuhr Road</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	9	9	190	0	190	176	244	420	54	167	221	840
Total	0	9	9	190	0	190	176	244	420	54	167	221	840
<b>#84</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	93	105	198	96	81	177	9	0	9	0	12	12	395
Total	93	105	198	96	81	177	9	0	9	0	12	12	395
<b>#86 I-5 NB Ramps at Stuhr Road</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	12	0	12	0	137	137	167	54	221	41	30	71	442
Total	12	0	12	0	137	137	167	54	221	41	30	71	442
<b>#94 Las Palmas Road at Hwy 33</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	73	69	142	0	0	0	0	0	0	69	73	142	283
Total	73	69	142	0	0	0	0	0	0	69	73	142	283
<b>#95</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	32	25	57	45	49	94	73	69	142	49	55	105	397
Total	32	25	57	45	49	94	73	69	142	49	55	105	397
<b>#96</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	56	52	108	52	56	108	0	0	0	0	0	0	216
Total	56	52	108	52	56	108	0	0	0	0	0	0	216
<b>#97</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	41	49	89	82	62	144	30	41	71	0	0	0	305
Total	41	49	89	82	62	144	30	41	71	0	0	0	305

PNEXT\_WP.CHD

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DIABLO GRANDE MASTER PLAN EIR  
PM Peak Hour Total Project - Revised Access  
exist.geo

Impact Analysis Report  
Level Of Service

Intersection	Base			Future			Change in
	LOS	Del/ Veh	V/ C	LOS	Del/ Veh	V/ C	
# 4 Ward Avenue at Sperry Road	A	0.0	0.000	A	0.0	0.000	+ 0.000 V/C
# 8 Ward Avenue at Marshall Road	A	0.0	0.000	A	0.0	0.000	+ 0.000 V/C
# 9 Ward Avenue at Oak Flat Road	A	0.0	0.000	A	0.0	0.000	+ 0.000 V/C
# 11 New Acces Road at Oak Flat Roa		0.0	0.000	F	52.9	1.001	+ 1.001 V/C
# 22 I-5 NB Ramps at Sperry Road	A	0.0	0.000	D	0.0	0.000	+ 0.000 V/C
# 24 I-5 SB Ramps at Sperry Road	A	0.0	0.000	F	0.0	0.000	+ 0.000 V/C
# 47 I-5 NB Ramps at Ward Avenue		0.0	0.000	A	2.0	0.188	+ 0.188 V/C
# 51 I-5 SB Ramps at Ward Avenue		0.0	0.000	A	11.9	0.376	+ 0.376 V/C
# 82 I-5 SB Ramps at Stuhr Road		0.0	0.000	A	11.1	0.266	+ 0.266 V/C
# 86 I-5 NB Ramps at Stuhr Road		0.0	0.000	A	8.5	0.161	+ 0.161 V/C

MLBALPR.DND

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DIABLO GRANDE MASTER PLAN EIR  
 AM Peak Hour Total Project Build Out Condition - Revised Access  
 Cumulative Without Lakeborough - cnlb\_up.geo

Trip Generation Report  
 ampk\_tot.GEN  
 Forecast for

Zone #	Subzone	Amount	Units	Rate In	Rate Out	Trips In	Trips Out	Total Trips	% Of Total
1		722.00	Daily Work	0.22	0.78	159	563	722	45.8
1		0.00		0.00	0.00	0	0	0	0.0
	Zone 1 Subtotal					159	563	722	45.8
2		189.00	Daily Other	1.00	0.00	189	0	189	12.0
2		0.00		0.00	0.00	0	0	0	0.0
	Zone 2 Subtotal					189	0	189	12.0
6		383.00	Daily Work	0.37	0.63	142	241	383	24.3
	Zone 6 Subtotal					142	241	383	24.3
8		281.00	Daily Work	0.33	0.67	93	188	281	17.8
	Zone 8 Subtotal					93	188	281	17.8
9		0.00	Daily Other	0.37	0.37	0	0	0	0.0
12		0.00	Daily Other	0.37	0.37	0	0	0	0.0
<b>TOTAL</b>						<b>583</b>	<b>992</b>	<b>1575</b>	<b>100.0</b>

DIABLO GRANDE MASTER PLAN EIR  
 AM Peak Hour Total Project Build Out Condition - Revised Access  
 Cumulative Without Lakeborough - cnlb\_mp.geo

Link Volume Report

Volume Type	NB Link			SB Link			EB Link			WB Link			Total Volume
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
<b>#3</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	510	267	776	0	0	0	0	0	0	267	510	776	1552
Total	510	267	776	0	0	0	0	0	0	267	510	776	1552
<b>#4 Ward Avenue at Sperry Road</b>													
Base	495	890	1385	1125	610	1735	800	1600	2400	1305	625	1930	7450
Added	7	4	11	31	30	60	65	67	131	40	42	82	286
Total	502	894	1396	1156	640	1795	865	1667	2531	1345	667	2012	7736
<b>#5 Speery Road at Hwy 33</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	40	42	82	42	40	82	0	0	0	165
Total	0	0	0	40	42	82	42	40	82	0	0	0	165
<b>#7</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	96	77	173	65	74	140	28	31	59	42	50	92	464
Total	96	77	173	65	74	140	28	31	59	42	50	92	464
<b>#8 Ward Avenue at Marshall Road</b>													
Base	405	830	1235	830	405	1235	0	0	0	20	20	40	2510
Added	7	23	30	4	7	11	0	0	0	19	0	19	61
Total	412	853	1265	834	412	1246	0	0	0	39	20	59	2571
<b>#9 Ward Avenue at Oak Flat Road</b>													
Base	416	850	1266	850	425	1275	20	11	31	0	0	0	2572
Added	70	58	128	23	7	30	53	81	135	0	0	0	293
Total	486	908	1394	873	432	1305	73	92	166	0	0	0	2865
<b>#11 New Acces Road at Oak Flat Road</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	267	510	776	563	348	911	81	53	135	1822
Total	0	0	0	267	510	776	563	348	911	81	53	135	1822
<b>#20</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	373	207	580	176	322	498	31	0	31	0	51	51	1161
Total	373	207	580	176	322	498	31	0	31	0	51	51	1161
<b>#22 I-5 NB Ramps at Sperry Road</b>													
Base	185	0	185	0	1840	1840	1005	450	1455	2165	1065	3230	6710
Added	51	0	51	0	422	422	481	112	594	67	65	131	1199
Total	236	0	236	0	2262	2262	1486	562	2049	2232	1130	3361	7909

NLBAUPR.CMD

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DIABLO GRANDE MASTER PLAN EIR  
 AM Peak Hour Total Project Build Out Condition - Revised Access  
 Cumulative Without Lakeborough - cnlb\_up.geo

Volume Type	NB Link			SB Link			EB Link			WB Link			Total Volume
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
<b>#24 I-5 SB Ramps at Sperry Road</b>													
Base	0	405	405	850	0	850	210	110	320	460	1005	1465	3040
Added	0	31	31	157	0	157	510	267	776	112	481	594	1558
Total	0	436	436	1007	0	1007	720	377	1096	572	1486	2059	4598
<b>#26</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	322	176	498	333	744	1077	0	157	157	422	0	422	2155
Total	322	176	498	333	744	1077	0	157	157	422	0	422	2155
<b>#45</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	199	113	312	101	373	474	12	0	12	181	7	188	986
Total	199	113	312	101	373	474	12	0	12	181	7	188	986
<b>#47 I-5 NB Ramps at Ward Avenue</b>													
Base	118	0	118	0	253	253	123	176	299	429	241	670	1340
Added	7	181	188	0	0	0	229	36	264	28	48	77	529
Total	125	181	306	0	253	253	352	212	563	457	289	747	1869
<b>#51 I-5 SB Ramps at Ward Avenue</b>													
Base	0	0	0	123	444	567	0	0	0	444	123	567	1134
Added	0	12	12	107	0	107	241	142	383	36	229	264	766
Total	0	12	12	230	444	674	241	142	383	480	352	831	1900
<b>#54 Ward Avenue at Fink Road</b>													
Base	125	249	374	0	0	0	578	827	1405	702	329	1031	2810
Added	87	94	181	0	4	4	106	24	130	0	70	70	385
Total	212	343	555	0	4	4	684	851	1535	702	399	1101	3195
<b>#56 Ward Avenue at Fink Road</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	94	87	181	0	0	0	87	94	181	362
Total	0	0	0	94	87	181	0	0	0	87	94	181	362
<b>#59</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>#63</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>#68</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	53	30	83	0	0	0	94	87	181	76	107	182	447
Total	53	30	83	0	0	0	94	87	181	76	107	182	447

NLBAWPR.CMD

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DIABLO GRANDE MASTER PLAN EIR  
 AM Peak Hour Total Project Build Out Condition - Revised Access  
 Cumulative Without Lakeborough - cnlb\_wp.geo

Volume Type	NB Link			SB Link			EB Link			WB Link			Total Volume
	In	Out	Total										
#69													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	19	19	107	76	182	95	107	201	402
Total	0	0	0	0	19	19	107	76	182	95	107	201	402
#73													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#77													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
#82 I-5 SB Ramps at Stuhr Road													
Base	0	20	20	30	0	30	0	0	0	20	30	50	100
Added	0	9	9	73	0	73	188	93	281	20	179	199	562
Total	0	29	29	103	0	103	188	93	281	40	209	249	662
#84													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	58	50	107	40	53	93	9	0	9	0	5	5	214
Total	58	50	107	40	53	93	9	0	9	0	5	5	214
#86 I-5 NB Ramps at Stuhr Road													
Base	10	0	10	0	60	60	30	30	60	80	30	110	240
Added	5	0	5	0	147	147	179	20	199	16	32	48	398
Total	15	0	15	0	207	207	209	50	259	96	62	158	638
#94 Las Palmas Road at Hwy 33													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	42	40	82	0	0	0	0	0	0	40	42	82	165
Total	42	40	82	0	0	0	0	0	0	40	42	82	165
#95													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	11	17	28	27	25	52	42	40	82	31	28	59	221
Total	11	17	28	27	25	52	42	40	82	31	28	59	221
#96													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	30	31	60	31	30	60	0	0	0	0	0	0	121
Total	30	31	60	31	30	60	0	0	0	0	0	0	121

NLBAWPR.CMD

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 DIABLO GRANDE MASTER PLAN EIR  
 AM Peak Hour Total Project Build Out Condition - Revised Access  
 Cumulative Without Lakeborough - cnlb\_up.geo  
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Volume Type	NB Link			SB Link			EB Link			WB Link			Total Volume
	In	Out	Total										
#97													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	27	20	47	30	53	83	32	16	48	0	0	0	178
Total	27	20	47	30	53	83	32	16	48	0	0	0	178

NLBAWPR.CHD

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DIABLO GRANDE MASTER PLAN EIR  
 AM Peak Hour Total Project Build Out Condition - Revised Access  
 Cumulative Without Lakeborough - cnlb\_mp.geo

Impact Analysis Report  
 Level Of Service

Intersection	Base		Future		Change in
	LOS	V/C	LOS	V/C	
# 4 Ward Avenue at Sperry Road	C	25.7 0.752	C	26.4 0.780	+ 0.029 V/C
# 8 Ward Avenue at Marshall Road	A	1.6 0.560	A	2.3 0.575	+ 0.015 V/C
# 9 Ward Avenue at Oak Flat Road	A	0.7 0.291	A	5.0 0.376	+ 0.085 V/C
# 11 New Acces Road at Oak Flat Roa		0.0 0.000	B	18.4 0.663	+ 0.663 V/C
# 22 I-5 NB Ramps at Sperry Road	A	4.7 0.526	E	13.3 0.905	+ 0.379 V/C
# 24 I-5 SB Ramps at Sperry Road	A	19.1 0.551	C	23.7 0.732	+ 0.181 V/C
# 47 I-5 NB Ramps at Ward Avenue	A	7.2 0.270	A	6.5 0.270	+ 0.000 V/C
# 51 I-5 SB Ramps at Ward Avenue	A	7.5 0.368	A	8.3 0.410	+ 0.043 V/C
# 54 Ward Avenue at Fink Road	B	5.1 0.601	F	78.8 1.162	+ 0.560 V/C
# 82 I-5 SB Ramps at Stuhr Road	A	0.0 0.000	A	0.0 0.000	+ 0.000 V/C
# 86 I-5 NB Ramps at Stuhr Road	A	0.0 0.000	A	0.0 0.000	+ 0.000 V/C

MLBPMPR.CMD

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DIABLO GRANDE MASTER PLAN EIR  
 PM Peak Hour Total Project Build Out Condition - Revised Access  
 Cumulative Without Lakeborough - cblb\_mp.geo

Trip Generation Report  
 pmpr\_tot.GEN  
 Forecast for

Zone #	Subzone	Amount	Units	Rate In	Rate Out	Trips In	Trips Out	Total Trips	% Of Total
1		859.00	Daily Work	0.67	0.33	576	283	859	35.8
1		0.00		0.00	0.00	0	0	0	0.0
	Zone 1 Subtotal					576	283	859	35.8
2		517.00	Daily Other	0.33	0.67	171	346	517	21.5
2		0.00		0.00	0.00	0	0	0	0.0
	Zone 2 Subtotal					171	346	517	21.5
6		605.00	Daily Work	0.58	0.42	351	254	605	25.2
	Zone 6 Subtotal					351	254	605	25.2
8		420.00	Daily Work	0.58	0.42	244	176	420	17.5
	Zone 8 Subtotal					244	176	420	17.5
9		0.00	Daily Other	0.37	0.37	0	0	0	0.0
12		0.00	Daily Other	0.37	0.37	0	0	0	0.0
<b>TOTAL</b>						<b>1342</b>	<b>1059</b>	<b>2401</b>	<b>100.0</b>

NLBPMR.CMD

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DIABLO GRANDE MASTER PLAN EIR  
PM Peak Hour Total Project Build Out Condition - Revised Access  
Cumulative Without Lakeborough - cblb\_mp.geo

Link Volume Report

Volume Type	NB Link			SB Link			EB Link			WB Link			Total Volume
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
<b>#3</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	481	632	1113	0	0	0	0	0	0	632	481	1113	2226
Total	481	632	1113	0	0	0	0	0	0	632	481	1113	2226
<b>#4 Ward Avenue at Sperry Road</b>													
Base	820	530	1350	650	1060	1710	1600	800	2400	620	1300	1920	7380
Added	8	11	18	52	56	108	121	110	232	69	73	142	499
Total	828	541	1368	702	1116	1818	1721	910	2632	689	1373	2062	7879
<b>#5 Sperry Road at Hwy 33</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	69	73	142	73	69	142	0	0	0	283
Total	0	0	0	69	73	142	73	69	142	0	0	0	283
<b>#7</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	141	150	291	120	119	240	55	49	105	79	77	156	792
Total	141	150	291	120	119	240	55	49	105	79	77	156	792
<b>#8 Ward Avenue at Marshall Road</b>													
Base	830	540	1370	540	830	1370	0	0	0	20	20	40	2780
Added	42	28	70	11	8	18	0	0	0	17	35	52	140
Total	872	568	1440	551	838	1388	0	0	0	37	55	92	2920
<b>#9 Ward Avenue at Oak Flat Road</b>													
Base	821	540	1361	540	830	1370	20	11	31	0	0	0	2762
Added	105	124	230	28	42	70	148	115	263	0	0	0	562
Total	926	664	1591	568	872	1440	168	126	294	0	0	0	3324
<b>#11 New Acces Road at Oak Flat Road</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	632	481	1113	629	747	1376	115	148	263	2752
Total	0	0	0	632	481	1113	629	747	1376	115	148	263	2752
<b>#20</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	391	537	928	446	323	769	91	0	91	0	68	68	1855
Total	391	537	928	446	323	769	91	0	91	0	68	68	1855
<b>#22 I-5 NB Ramps at Sperry Road</b>													
Base	405	0	405	0	850	850	1825	270	2095	1065	2175	3240	6590
Added	68	0	68	0	281	281	397	173	571	110	121	232	1152
Total	473	0	473	0	1131	1131	2222	443	2666	1175	2296	3472	7742

NLBPVPR.CMD

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DIABLO GRANDE MASTER PLAN EIR  
PM Peak Hour Total Project Build Out Condition - Revised Access  
Cumulative Without Lakeborough - cblb\_wp.geo

Volume Type	NB Link			SB Link			EB Link			WB Link			Total Volume
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
<b>#24 1-5 SB Ramps at Sperry Road</b>													
Base	0	185	185	1840	0	1840	110	210	320	270	1825	2095	4440
Added	0	91	91	466	0	466	481	632	1113	173	397	571	2241
Total	0	276	276	2306	0	2306	591	842	1433	443	2222	2666	6681
<b>#26</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	323	446	769	912	604	1516	0	466	466	281	0	281	3033
Total	323	446	769	912	604	1516	0	466	466	281	0	281	3033
<b>#45</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	218	286	504	274	391	664	13	0	13	191	18	208	1389
Total	218	286	504	274	391	664	13	0	13	191	18	208	1389
<b>#47 1-5 NB Ramps at Ward Avenue</b>													
Base	443	0	443	0	129	129	244	334	578	463	687	1150	2300
Added	18	191	208	0	0	0	241	88	329	70	51	121	658
Total	461	191	651	0	129	129	485	422	907	533	738	1271	2958
<b>#51 1-5 SB Ramps at Ward Avenue</b>													
Base	0	0	0	244	219	463	0	0	0	219	244	463	926
Added	0	13	13	263	0	263	254	351	605	88	241	329	1210
Total	0	13	13	507	219	726	254	351	605	307	485	792	2136
<b>#54 Ward Avenue at Fink Road</b>													
Base	95	129	224	0	0	0	625	234	859	143	500	643	1726
Added	157	157	314	0	11	11	175	60	235	0	105	105	665
Total	252	286	538	0	11	11	800	294	1094	143	605	748	2391
<b>#56 Ward Avenue at Fink Road</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	157	157	314	0	0	0	157	157	314	628
Total	0	0	0	157	157	314	0	0	0	157	157	314	628
<b>#59</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>#63</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>#68</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	62	82	144	0	0	0	157	157	314	158	138	296	754
Total	62	82	144	0	0	0	157	157	314	158	138	296	754

DIABLO GRANDE MASTER PLAN EIR  
 PM Peak Hour Total Project Build Out Condition - Revised Access  
 Cumulative Without Lakeborough - cblb\_wp.geo

Volume Type	NB Link			SB Link			EB Link			WB Link			Total Volume
	In	Out	Total										
<b>#69</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	35	17	52	138	158	296	175	173	348	696
Total	0	0	0	35	17	52	138	158	296	175	173	348	696
<b>#73</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>#77</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>#82 I-5 SB Ramps at Stuhr Road</b>													
Base	0	10	10	60	0	60	0	0	0	10	60	70	140
Added	0	9	9	190	0	190	176	244	420	54	167	221	840
Total	0	19	19	250	0	250	176	244	420	64	227	291	980
<b>#84</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	93	105	198	96	81	177	9	0	9	0	12	12	395
Total	93	105	198	96	81	177	9	0	9	0	12	12	395
<b>#86 I-5 NB Ramps at Stuhr Road</b>													
Base	20	0	20	0	30	30	60	30	90	40	60	100	240
Added	12	0	12	0	137	137	167	54	221	41	30	71	442
Total	32	0	32	0	167	167	227	84	311	81	90	171	682
<b>#94 Las Palmas Road at Hwy 33</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	73	69	142	0	0	0	0	0	0	69	73	142	283
Total	73	69	142	0	0	0	0	0	0	69	73	142	283
<b>#95</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	32	25	57	45	49	94	73	69	142	49	55	105	397
Total	32	25	57	45	49	94	73	69	142	49	55	105	397
<b>#96</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	56	52	108	52	56	108	0	0	0	0	0	0	216
Total	56	52	108	52	56	108	0	0	0	0	0	0	216

NLBWPR.CMD

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DIABLO GRANDE MASTER PLAN EIR  
 PM Peak Hour Total Project Build Out Condition - Revised Access  
 Cumulative Without Lakeborough - cblb\_wp.geo

Volume Type	NB Link			SB Link			EB Link			WB Link			Total Volume
	In	Out	Total										
#97													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	41	49	89	82	62	144	30	41	71	0	0	0	305
Total	41	49	89	82	62	144	30	41	71	0	0	0	305

NLBPMR.CMD

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DIABLO GRANDE MASTER PLAN EIR  
 PM Peak Hour Total Project Build Out Condition - Revised Access  
 Cumulative Without Lakeborough - cblb\_up.geo

Impact Analysis Report  
 Level Of Service

Intersection	Base			Future			Change in
	LOS	Del/ Veh	V/ C	LOS	Del/ Veh	V/ C	
# 4 Ward Avenue at Sperry Road	B	22.0	0.636	B	22.1	0.672	+ 0.036 V/C
# 8 Ward Avenue at Marshall Road	A	1.0	0.367	A	1.6	0.385	+ 0.018 V/C
# 9 Ward Avenue at Oak Flat Road	A	0.6	0.280	A	8.5	0.358	+ 0.078 V/C
# 11 New Acces Road at Oak Flat Roa		0.0	0.000	F	52.9	1.001	+ 1.001 V/C
# 22 I-5 NB Ramps at Sperry Road	C	10.2	0.704	D	15.6	0.800	+ 0.096 V/C
# 24 I-5 SB Ramps at Sperry Road	B	9.7	0.607	C	19.1	0.781	+ 0.174 V/C
# 47 I-5 NB Ramps at Ward Avenue	A	14.5	0.500	A	14.6	0.537	+ 0.037 V/C
# 51 I-5 SB Ramps at Ward Avenue	A	12.0	0.248	A	11.6	0.353	+ 0.105 V/C
# 54 Ward Avenue at Fink Road	B	9.9	0.628	D	34.5	0.869	+ 0.242 V/C
# 82 I-5 SB Ramps at Stuhr Road	A	0.0	0.000	A	0.0	0.000	+ 0.000 V/C
# 86 I-5 NB Ramps at Stuhr Road	A	0.0	0.000	A	0.0	0.000	+ 0.000 V/C

LIBAMPR.DMD

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DIABLO GRANDE MASTER PLAN EIR  
AM Peak Hour Total Project Build Out Condition - Revised Access  
Cumulative With Lakeborough - clb\_up.geo

Trip Generation Report  
mpk\_tot.GEN  
Forecast for

Zone #	Subzone	Amount	Units	Rate In	Rate Out	Trips In	Trips Out	Total Trips	% Of Total
1		722.00	Daily Work	0.22	0.78	159	563	722	45.8
1		0.00		0.00	0.00	0	0	0	0.0
	Zone 1 Subtotal					159	563	722	45.8
2		189.00	Daily Other	1.00	0.00	189	0	189	12.0
2		0.00		0.00	0.00	0	0	0	0.0
	Zone 2 Subtotal					189	0	189	12.0
6		383.00	Daily Work	0.37	0.63	142	241	383	24.3
	Zone 6 Subtotal					142	241	383	24.3
8		281.00	Daily Work	0.33	0.67	93	188	281	17.8
	Zone 8 Subtotal					93	188	281	17.8
9		0.00	Daily Other	0.37	0.37	0	0	0	0.0
12		0.00	Daily Other	0.37	0.37	0	0	0	0.0
<b>TOTAL</b>						<b>583</b>	<b>992</b>	<b>1575</b>	<b>100.0</b>

LBAWPR.CMD

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DIABLO GRANDE MASTER PLAN EIR  
AM Peak Hour Total Project Build Out Condition - Revised Access  
Cumulative With Lakeborough - clb\_wp.geo

Link Volume Report

Volume Type	NB Link			SB Link			EB Link			WB Link			Total Volume
	In	Out	Total										
<b>#3</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	510	267	776	0	0	0	0	0	0	267	510	776	1552
Total	510	267	776	0	0	0	0	0	0	267	510	776	1552
<b>#4 Ward Avenue at Sperry Road</b>													
Base	745	1020	1765	1190	735	1925	800	1600	2400	1370	750	2120	8210
Added	7	4	11	31	30	60	65	67	131	40	42	82	286
Total	752	1024	1776	1221	765	1985	865	1667	2531	1410	792	2202	8496
<b>#5 Speery Road at Hwy 33</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	40	42	82	42	40	82	0	0	0	165
Total	0	0	0	40	42	82	42	40	82	0	0	0	165
<b>#7</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	96	77	173	65	74	140	28	31	59	42	50	92	464
Total	96	77	173	65	74	140	28	31	59	42	50	92	464
<b>#8 Ward Avenue at Marshall Road</b>													
Base	655	960	1615	960	655	1615	0	0	0	20	20	40	3270
Added	7	23	30	4	7	11	0	0	0	19	0	19	61
Total	662	983	1645	964	662	1626	0	0	0	39	20	59	3331
<b>#9 Ward Avenue at Oak Flat Road</b>													
Base	666	980	1646	980	675	1655	20	11	31	0	0	0	3332
Added	70	58	128	23	7	30	53	81	135	0	0	0	293
Total	736	1038	1774	1003	682	1685	73	92	166	0	0	0	3625
<b>#11 New Acces Road at Oak Flat Road</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	267	510	776	563	348	911	81	53	135	1822
Total	0	0	0	267	510	776	563	348	911	81	53	135	1822
<b>#20</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	373	207	580	176	322	498	31	0	31	0	51	51	1161
Total	373	207	580	176	322	498	31	0	31	0	51	51	1161
<b>#22 I-5 NB Ramps at Sperry Road</b>													
Base	185	0	185	0	1840	1840	1005	450	1455	2165	1065	3230	6710
Added	51	0	51	0	422	422	481	112	594	67	65	131	1199
Total	236	0	236	0	2262	2262	1486	562	2049	2232	1130	3361	7909

DIABLO GRANDE MASTER PLAN EIR  
 AM Peak Hour Total Project Build Out Condition - Revised Access  
 Cumulative With Lakeborough - clb\_up.geo

Volume Type	NB Link			SB Link			EB Link			WB Link			Total Volume
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
<b>#24 I-5 SB Ramps at Sperry Road</b>													
Base	0	405	405	850	0	850	210	110	320	460	1005	1465	3040
Added	0	31	31	157	0	157	510	267	776	112	481	594	1558
Total	0	436	436	1007	0	1007	720	377	1096	572	1486	2059	4598
<b>#26</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	322	176	498	333	744	1077	0	157	157	422	0	422	2155
Total	322	176	498	333	744	1077	0	157	157	422	0	422	2155
<b>#45</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	199	113	312	101	373	474	12	0	12	181	7	188	986
Total	199	113	312	101	373	474	12	0	12	181	7	188	986
<b>#47 I-5 NB Ramps at Ward Avenue</b>													
Base	486	840	1326	0	253	253	1300	988	2288	873	578	1451	5318
Added	7	181	188	0	0	0	229	36	264	28	48	77	529
Total	493	1021	1514	0	253	253	1529	1024	2552	901	626	1528	5847
<b>#51 I-5 SB Ramps at Ward Avenue</b>													
Base	0	238	238	450	444	894	1415	871	2286	988	1300	2288	5706
Added	0	12	12	107	0	107	241	142	383	36	229	264	766
Total	0	250	250	557	444	1001	1656	1013	2669	1024	1529	2552	6472
<b>#54 Ward Avenue at Fink Road</b>													
Base	171	186	357	0	0	0	441	801	1242	630	255	885	2484
Added	87	94	181	0	4	4	106	24	130	0	70	70	385
Total	258	280	538	0	4	4	547	825	1372	630	325	955	2869
<b>#56 Ward Avenue at Fink Road</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	94	87	181	0	0	0	87	94	181	362
Total	0	0	0	94	87	181	0	0	0	87	94	181	362
<b>#59</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>#63</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>#68</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	53	30	83	0	0	0	94	87	181	76	107	182	447
Total	53	30	83	0	0	0	94	87	181	76	107	182	447

DIABLO GRANDE MASTER PLAN EIR  
AM Peak Hour Total Project Build Out Condition - Revised Access  
Cumulative With Lakeborough - clb\_wp.geo

Volume Type	NB Link			SB Link			EB Link			WB Link			Total Volume
	In	Out	Total										
<b>#69</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	19	19	107	76	182	95	107	201	402
Total	0	0	0	0	19	19	107	76	182	95	107	201	402
<b>#73</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>#77</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>#82 I-5 SB Ramps at Stuhr Road</b>													
Base	0	20	20	30	0	30	0	0	0	20	30	50	100
Added	0	9	9	73	0	73	188	93	281	20	179	199	562
Total	0	29	29	103	0	103	188	93	281	40	209	249	662
<b>#84</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	58	50	107	40	53	93	9	0	9	0	5	5	214
Total	58	50	107	40	53	93	9	0	9	0	5	5	214
<b>#86 I-5 NB Ramps at Stuhr Road</b>													
Base	10	0	10	0	60	60	30	30	60	80	30	110	240
Added	5	0	5	0	147	147	179	20	199	16	32	48	398
Total	15	0	15	0	207	207	209	50	259	96	62	158	638
<b>#94 Las Palmas Road at Hwy 33</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	42	40	82	0	0	0	0	0	0	40	42	82	165
Total	42	40	82	0	0	0	0	0	0	40	42	82	165
<b>#95</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	11	17	28	27	25	52	42	40	82	31	28	59	221
Total	11	17	28	27	25	52	42	40	82	31	28	59	221
<b>#96</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	30	31	60	31	30	60	0	0	0	0	0	0	121
Total	30	31	60	31	30	60	0	0	0	0	0	0	121

LBAWPR.CMD

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 DIABLO GRANDE MASTER PLAN EIR  
 AM Peak Hour Total Project Build Out Condition - Revised Access  
 Cumulative With Lakeborough - clb\_mp.geo  
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Volume Type	NB Link			SB Link			EB Link			WB Link			Total Volume
	In	Out	Total										
#97													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	27	20	47	30	53	83	32	16	48	0	0	0	178
Total	27	20	47	30	53	83	32	16	48	0	0	0	178

LBAWPR.CHD

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DIABLO GRANDE MASTER PLAN EIR  
 AM Peak Hour Total Project Build Out Condition - Revised Access  
 Cumulative With Lakeborough - clb\_mp.geo

Impact Analysis Report  
 Level Of Service

Intersection	Base		Future		Change in
	LOS	Veh C	LOS	Veh C	
# 4 Ward Avenue at Sperry Road	B	19.5 0.667	B	19.8 0.687	+ 0.020 V/C
# 8 Ward Avenue at Marshall Road	B	1.7 0.647	B	2.3 0.662	+ 0.015 V/C
# 9 Ward Avenue at Oak Flat Road	A	0.5 0.331	A	4.1 0.409	+ 0.079 V/C
# 11 New Acces Road at Oak Flat Roa		0.0 0.000	B	18.4 0.663	+ 0.663 V/C
# 22 I-5 NB Ramps at Sperry Road	A	4.7 0.526	E	13.3 0.905	+ 0.379 V/C
# 24 I-5 SB Ramps at Sperry Road	A	19.1 0.551	C	23.7 0.732	+ 0.181 V/C
# 47 I-5 NB Ramps at Ward Avenue	C	8.7 0.758	D	11.4 0.892	+ 0.134 V/C
# 51 I-5 SB Ramps at Ward Avenue	A	3.0 0.517	B	2.8 0.601	+ 0.083 V/C
# 54 Ward Avenue at Fink Road	A	7.0 0.583	F	49.1 1.043	+ 0.461 V/C
# 82 I-5 SB Ramps at Stuhr Road	A	0.0 0.000	A	0.0 0.000	+ 0.000 V/C
# 86 I-5 NB Ramps at Stuhr Road	A	0.0 0.000	A	0.0 0.000	+ 0.000 V/C

LEPMPR.DBD

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DIABLO GRANDE MASTER PLAN EIR  
 PM Peak Hour Total Project Build Out Condition - Revised Access  
 Cumulative With Lakeborough - clb\_wp.geo

Trip Generation Report

pmpk\_tot.GEN

Forecast for

Zone #	Subzone	Amount	Units	Rate In	Rate Out	Trips In	Trips Out	Total Trips	% Of Total
1		859.00	Daily Work	0.67	0.33	576	283	859	35.8
1		0.00		0.00	0.00	0	0	0	0.0
	Zone 1 Subtotal					576	283	859	35.8
2		517.00	Daily Other	0.33	0.67	171	346	517	21.5
2		0.00		0.00	0.00	0	0	0	0.0
	Zone 2 Subtotal					171	346	517	21.5
6		605.00	Daily Work	0.58	0.42	351	254	605	25.2
	Zone 6 Subtotal					351	254	605	25.2
8		420.00	Daily Work	0.58	0.42	244	176	420	17.5
	Zone 8 Subtotal					244	176	420	17.5
9		0.00	Daily Other	0.37	0.37	0	0	0	0.0
12		0.00	Daily Other	0.37	0.37	0	0	0	0.0
<b>TOTAL</b>						<b>1342</b>	<b>1059</b>	<b>2401</b>	<b>100.0</b>

DIABLO GRANDE MASTER PLAN EIR  
PM Peak Hour Total Project Build Out Condition - Revised Access  
Cumulative With Lakeborough - clb\_up.geo

Link Volume Report

Volume Type	NB Link			SB Link			EB Link			WB Link			Total Volume
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
<b>#3</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	481	632	1113	0	0	0	0	0	0	632	481	1113	2226
Total	481	632	1113	0	0	0	0	0	0	632	481	1113	2226
<b>#4 Ward Avenue at Sperry Road</b>													
Base	980	780	1760	775	1150	1925	1600	800	2400	745	1370	2115	8200
Added	8	11	18	52	56	108	121	110	232	69	73	142	499
Total	988	791	1778	827	1206	2033	1721	910	2632	814	1443	2257	8699
<b>#5 Sperry Road at Hwy 33</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	69	73	142	73	69	142	0	0	0	283
Total	0	0	0	69	73	142	73	69	142	0	0	0	283
<b>#7</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	141	150	291	120	119	240	55	49	105	79	77	156	792
Total	141	150	291	120	119	240	55	49	105	79	77	156	792
<b>#8 Ward Avenue at Marshall Road</b>													
Base	970	790	1760	790	970	1760	0	0	0	20	20	40	3560
Added	42	28	70	11	8	18	0	0	0	17	35	52	140
Total	1012	818	1830	801	978	1778	0	0	0	37	55	92	3700
<b>#9 Ward Avenue at Oak Flat Road</b>													
Base	961	790	1751	790	970	1760	20	11	31	0	0	0	3542
Added	105	124	230	28	42	70	148	115	263	0	0	0	562
Total	1066	914	1981	818	1012	1830	168	126	294	0	0	0	4104
<b>#11 New Access Road at Oak Flat Road</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	632	481	1113	629	747	1376	115	148	263	2752
Total	0	0	0	632	481	1113	629	747	1376	115	148	263	2752
<b>#20</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	391	537	928	446	323	769	91	0	91	0	68	68	1855
Total	391	537	928	446	323	769	91	0	91	0	68	68	1855
<b>#22 I-5 NB Ramps at Sperry Road</b>													
Base	405	0	405	0	850	850	1825	270	2095	1065	2175	3240	6590
Added	68	0	68	0	281	281	397	173	571	110	121	232	1152
Total	473	0	473	0	1131	1131	2222	443	2666	1175	2296	3472	7742

DIABLO GRANDE MASTER PLAN EIR  
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Volume Type	NB Link			SB Link			EB Link			WB Link			Total Volume
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
<b>#24 I-5 SB Ramps at Sperry Road</b>													
Base	0	185	185	1840	0	1840	110	210	320	270	1825	2095	4440
Added	0	91	91	466	0	466	481	632	1113	173	397	571	2241
Total	0	276	276	2306	0	2306	591	842	1433	443	2222	2666	6681
<b>#26</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	323	446	769	912	604	1516	0	466	466	281	0	281	3033
Total	323	446	769	912	604	1516	0	466	466	281	0	281	3033
<b>#45</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	218	286	504	274	391	664	13	0	13	191	18	208	1389
Total	218	286	504	274	391	664	13	0	13	191	18	208	1389
<b>#47 I-5 NB Ramps at Ward Avenue</b>													
Base	765	349	1114	0	129	129	782	875	1657	682	876	1558	4458
Added	18	191	208	0	0	0	241	88	329	70	51	121	658
Total	783	540	1322	0	129	129	1023	963	1986	752	927	1679	5116
<b>#51 I-5 SB Ramps at Ward Avenue</b>													
Base	0	483	483	1038	219	1257	1021	1450	2471	875	782	1657	5868
Added	0	13	13	263	0	263	254	351	605	88	241	329	1210
Total	0	496	496	1301	219	1520	1275	1801	3076	963	1023	1986	7078
<b>#54 Ward Avenue at Fink Road</b>													
Base	179	177	356	0	0	0	814	568	1382	393	641	1034	2772
Added	157	157	314	0	11	11	175	60	235	0	105	105	665
Total	336	334	670	0	11	11	989	628	1617	393	746	1139	3437
<b>#56 Ward Avenue at Fink Road</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	157	157	314	0	0	0	157	157	314	628
Total	0	0	0	157	157	314	0	0	0	157	157	314	628
<b>#59</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>#63</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>#68</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	62	82	144	0	0	0	157	157	314	158	138	296	754
Total	62	82	144	0	0	0	157	157	314	158	138	296	754

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Volume Type	NB Link			SB Link			EB Link			WB Link			Total Volume
	In	Out	Total										
<b>#69</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	35	17	52	138	158	296	175	173	348	696
Total	0	0	0	35	17	52	138	158	296	175	173	348	696
<b>#73</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>#77</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>#82 I-5 SB Ramps at Stuhr Road</b>													
Base	0	10	10	60	0	60	0	0	0	10	60	70	140
Added	0	9	9	190	0	190	176	244	420	54	167	221	840
Total	0	19	19	250	0	250	176	244	420	64	227	291	980
<b>#84</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	93	105	198	96	81	177	9	0	9	0	12	12	395
Total	93	105	198	96	81	177	9	0	9	0	12	12	395
<b>#86 I-5 NB Ramps at Stuhr Road</b>													
Base	20	0	20	0	30	30	60	30	90	40	60	100	240
Added	12	0	12	0	137	137	167	54	221	41	30	71	442
Total	32	0	32	0	167	167	227	84	311	81	90	171	682
<b>#94 Las Palmas Road at Hwy 33</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	73	69	142	0	0	0	0	0	0	69	73	142	283
Total	73	69	142	0	0	0	0	0	0	69	73	142	283
<b>#95</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	32	25	57	45	49	94	73	69	142	49	55	105	397
Total	32	25	57	45	49	94	73	69	142	49	55	105	397
<b>#96</b>													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	56	52	108	52	56	108	0	0	0	0	0	0	216
Total	56	52	108	52	56	108	0	0	0	0	0	0	216

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Volume Type	NB Link			SB Link			EB Link			WB Link			Total Volume
	In	Out	Total										
#97													
Base	0	0	0	0	0	0	0	0	0	0	0	0	0
Added	41	49	89	82	62	144	30	41	71	0	0	0	305
Total	41	49	89	82	62	144	30	41	71	0	0	0	305

LBPMR.CMD

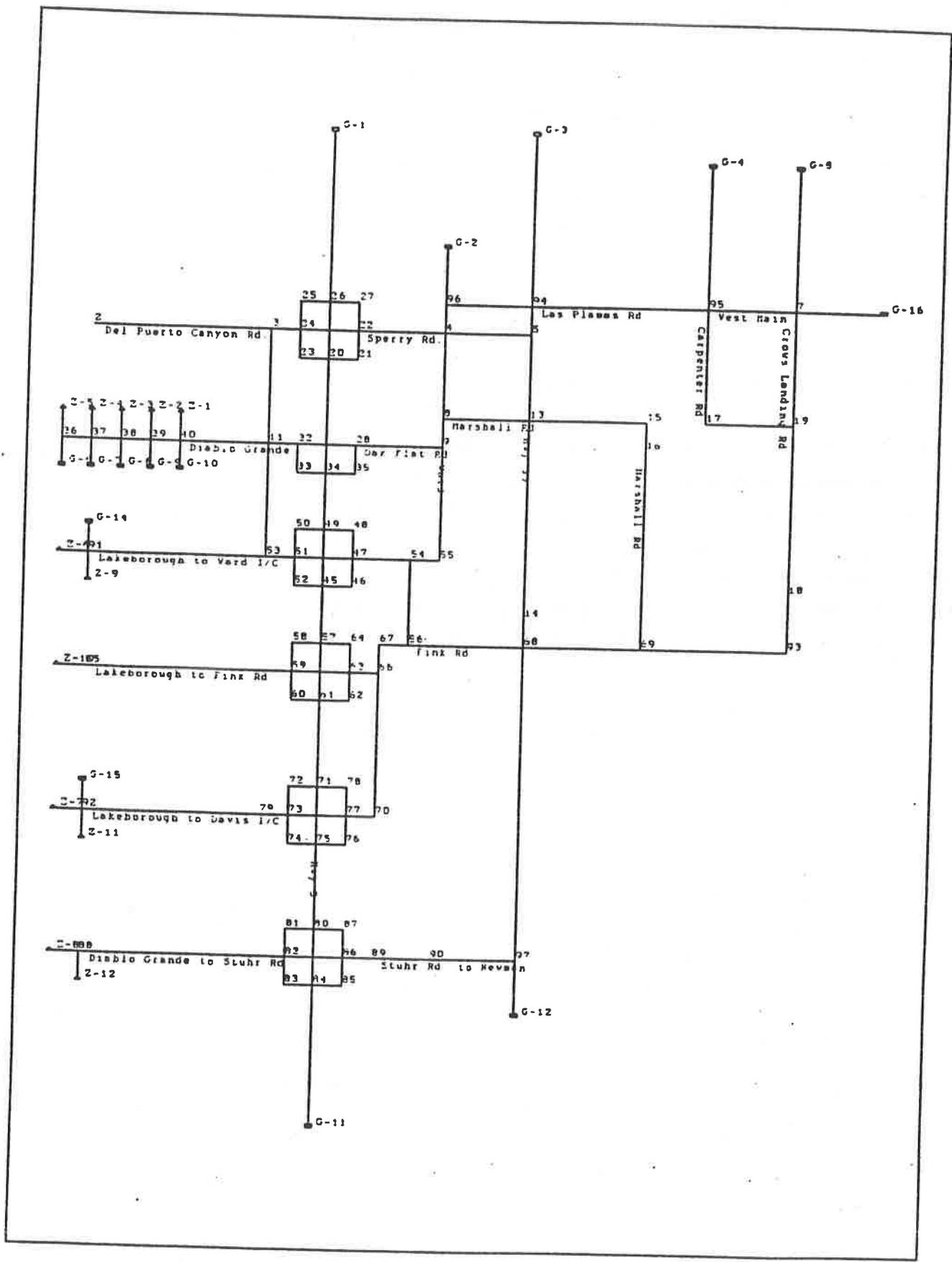
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DIABLO GRANDE MASTER PLAN EIR  
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Impact Analysis Report  
 Level Of Service

Intersection	Base			Future			Change in
	LOS	Del/ Veh	V/ C	LOS	Del/ Veh	V/ C	
# 4 Ward Avenue at Sperry Road	B	19.5	0.694	C	19.8	0.724	+ 0.029 V/C
# 8 Ward Avenue at Marshall Road	A	1.1	0.533	A	1.5	0.552	+ 0.018 V/C
# 9 Ward Avenue at Oak Flat Road	A	0.5	0.327	A	7.4	0.412	+ 0.085 V/C
# 11 New Acces Road at Oak Flat Roa		0.0	0.000	F	52.9	1.001	+ 1.001 V/C
# 22 I-5 NB Ramps at Sperry Road	C	10.2	0.704	D	15.6	0.800	+ 0.096 V/C
# 24 I-5 SB Ramps at Sperry Road	B	9.7	0.607	C	19.1	0.781	+ 0.174 V/C
# 47 I-5 NB Ramps at Ward Avenue	A	13.6	0.576	C	13.1	0.715	+ 0.139 V/C
# 51 I-5 SB Ramps at Ward Avenue	A	6.0	0.529	A	5.7	0.538	+ 0.009 V/C
# 54 Ward Avenue at Fink Road	F	43.0	1.008	F	196.7	1.250	+ 0.242 V/C
# 82 I-5 SB Ramps at Stuhr Road	A	0.0	0.000	A	0.0	0.000	+ 0.000 V/C
# 86 I-5 NB Ramps at Stuhr Road	A	0.0	0.000	A	0.0	0.000	+ 0.000 V/C



**APPENDIX D: KIT FOX SURVEY REPORTS**

**DIABLO GRANDE ACCESS ROAD  
SAN JOAQUIN KIT FOX ASSESSMENT  
STANISLAUS COUNTY, CALIFORNIA**

*July 14, 1992*

*Prepared for:*

*Stanislaus County  
Department of Planning and  
Community Development  
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Modesto, CA 95354*

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LSA Project #STC10*

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## SUMMARY

Standard survey methodologies, including scent stations, automated camera stations, spotlighting surveys, and ground surveys, did reveal the presence of many other animal species. The road corridor contains suitable kit fox habitat and kit foxes have been reported in the recent past immediately to the south and to the north of the site, indicating that kit foxes are present in the region. No direct, positive evidence of current San Joaquin kit fox activity was detected on the route of the Diablo Grande access road. 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.

## INTRODUCTION

### **PURPOSE OF STUDY**

The proposed primary access road corridor for the Diablo Grande project is located within the mapped range of the San Joaquin kit fox (*Vulpes macrotis mutica*) a federal and state listed species. The purpose of this study was to determine the suitability of the habitat within the road corridor for kit fox occupancy and to determine if kit fox are currently using any portion of the road corridor.

### **PROJECT DESCRIPTION**

The project site is a 3.4 mile long corridor located in southwestern Stanislaus County, southwest of Patterson, California (Figure 1). On the USGS Patterson quadrangle (7.5 minute series), this is located in T.5S and T.6S, R.7E, and includes parts of Sections 34, 3, and 10 (Figure 2).

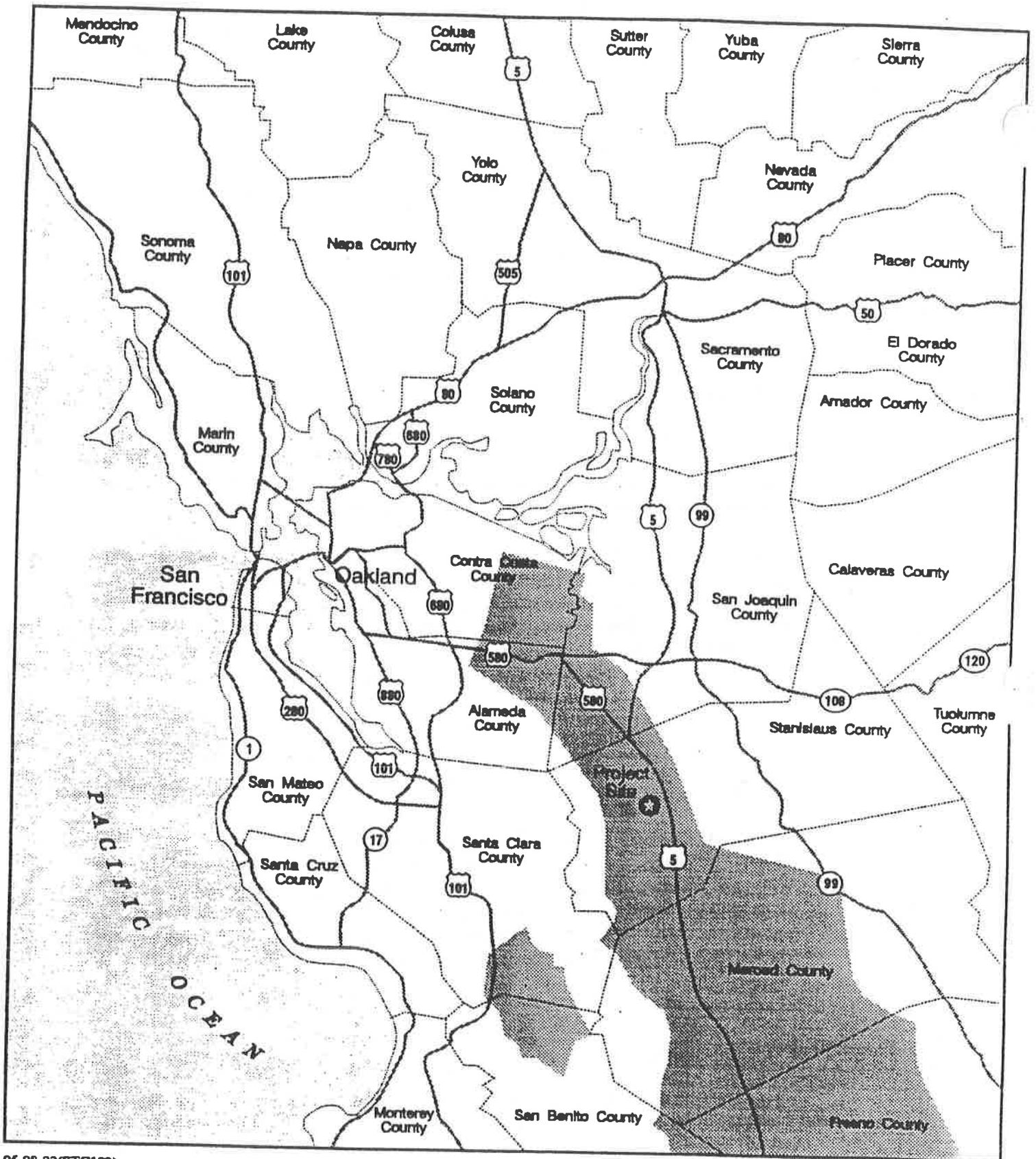
The Diablo Grande project has proposed to construct a two-lane access road which would connect the Del Puerto Canyon Road interchange with Oak Flat Road. The access road would begin immediately to the west of Interstate Highway 5 from Del Puerto Canyon Road and would head in a southerly direction to Oak Flat Road. The road corridor would roughly parallel Highway 5. The land within the road corridor is used for livestock grazing.

### **REGULATORY CONTEXT**

The San Joaquin subspecies of the kit fox is listed by the U.S. Fish and Wildlife Service (USFWS) as endangered and by the California Department of Fish and Game (CDFG) as threatened. A species is considered to be endangered if it is danger of extinction throughout all or a significant portion of its range. A species is considered to be threatened when it is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

#### ***U.S. Fish and Wildlife Service***

The USFWS has jurisdiction over formally listed threatened and endangered species under the Federal Endangered Species Act. The act protects listed species from harm or "take," which is broadly defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." An activity is defined as "take" even if it is unintentional or accidental.



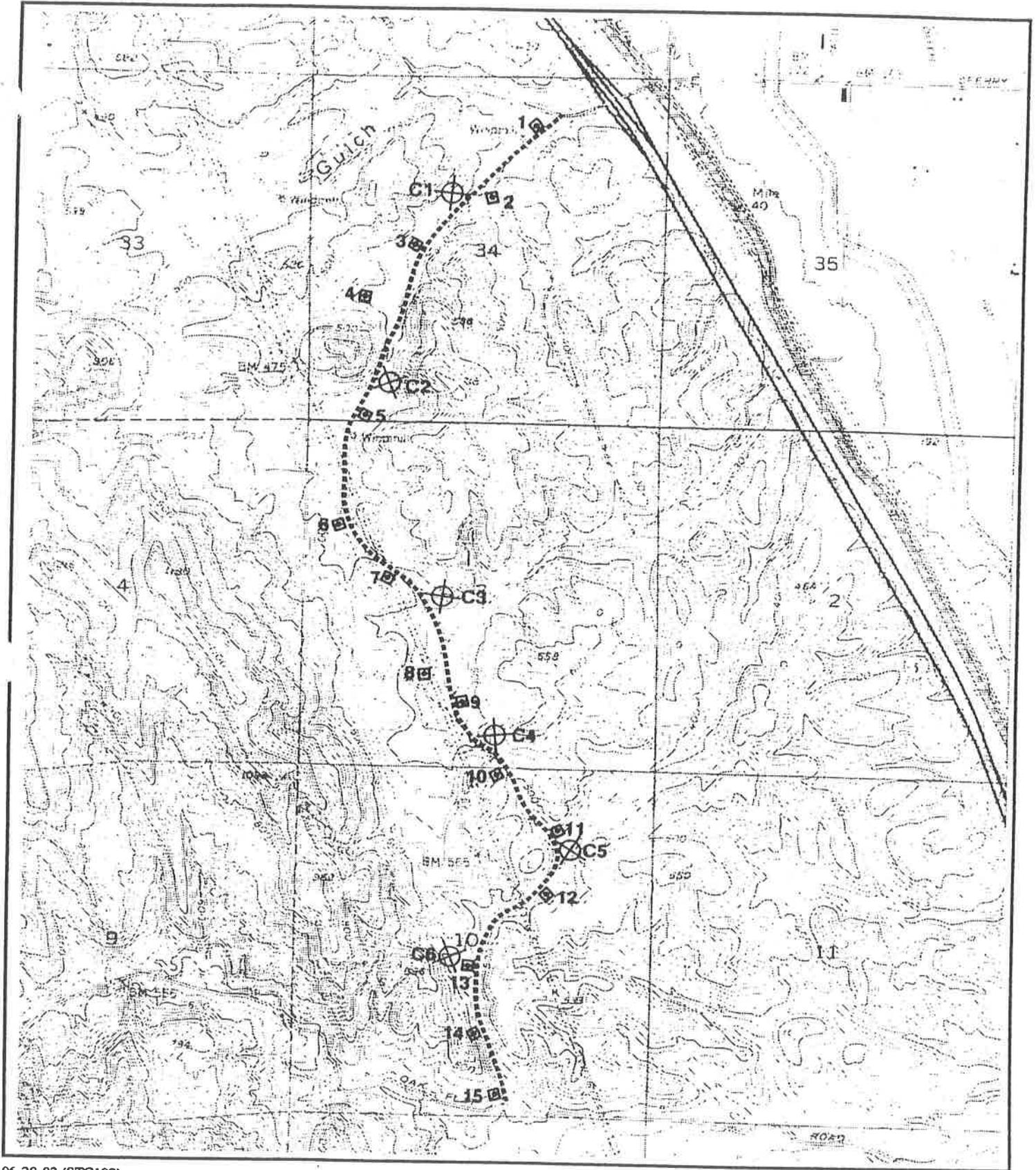
05-08-92(STC102)

Figure 1

 Approximate Kit Fox Range (USFWS 1990)



Regional Location and Approximate Kit Fox Range



06-29-92 (STC102)

Figure 2

  
**LSA**  
 Scale in feet  
  
 0 2000

-  Scent Station
-  Camera Station
-  Proposed Road

Locations of Scent and Camera Stations

Violation of the Endangered Species Act places the individual or company in jeopardy for both civil and criminal penalties, which may include fines and imprisonment. An "incidental take" permit may be issued by the USFWS allowing take under certain circumstances. For projects with a federal lead agency, an incidental take can occur under Section 7 of the Endangered Species Act.

For projects without a federal lead agency and on land that is not administered by the federal government, an incidental take permit may be issued under Section 10 of the Endangered Species Act upon approval of a Habitat Conservation Plan. The Habitat Conservation Plan examines in detail the biology and distribution of federally listed and candidate species and methods to conserve the species while allowing development.

### *California Department of Fish and Game*

The CDFG has jurisdiction over state-listed threatened and endangered species. The state and federal lists are generally similar, although a few species present on one list may be absent on the other and vice versa. CDFG's jurisdictional requirements are essentially similar to those of the USFWS.

## **STUDY METHODS**

### *Pre-Field Investigations*

Prior to conducting the field survey of the project site, we consulted with biologists at the CDFG. Additional kit fox occurrences in the vicinity of the project site were identified through a search of the California Natural Diversity Data Base (CNDDDB 1992) and from a review of the Lakeborough EIR (WESCO; 1989).

## **FIELD SURVEY**

A combination of four survey techniques were used to investigate the activities of San Joaquin kit foxes in the project site, following the San Joaquin kit fox survey methodology recommended by CDFG Region 4 (CDFG 1990): 1) Scent stations; 2) spotlighting surveys; 3) ground transects; and 4) remote camera stations. Field work was conducted between June 1 and June 19, 1992 for a total of 30 person-days.

### *Scent Stations*

Scent stations were set up in the road corridor at a density of approximately five per section (1 per 128 acres) (Figure 2). Fifteen scent stations were

established in a roughly linear fashion along the road corridor. On June 3 and 4, five scent stations were set up and monitoring begun. The remaining ten stations were established on June 5, and all 15 stations were monitored for six more nights.

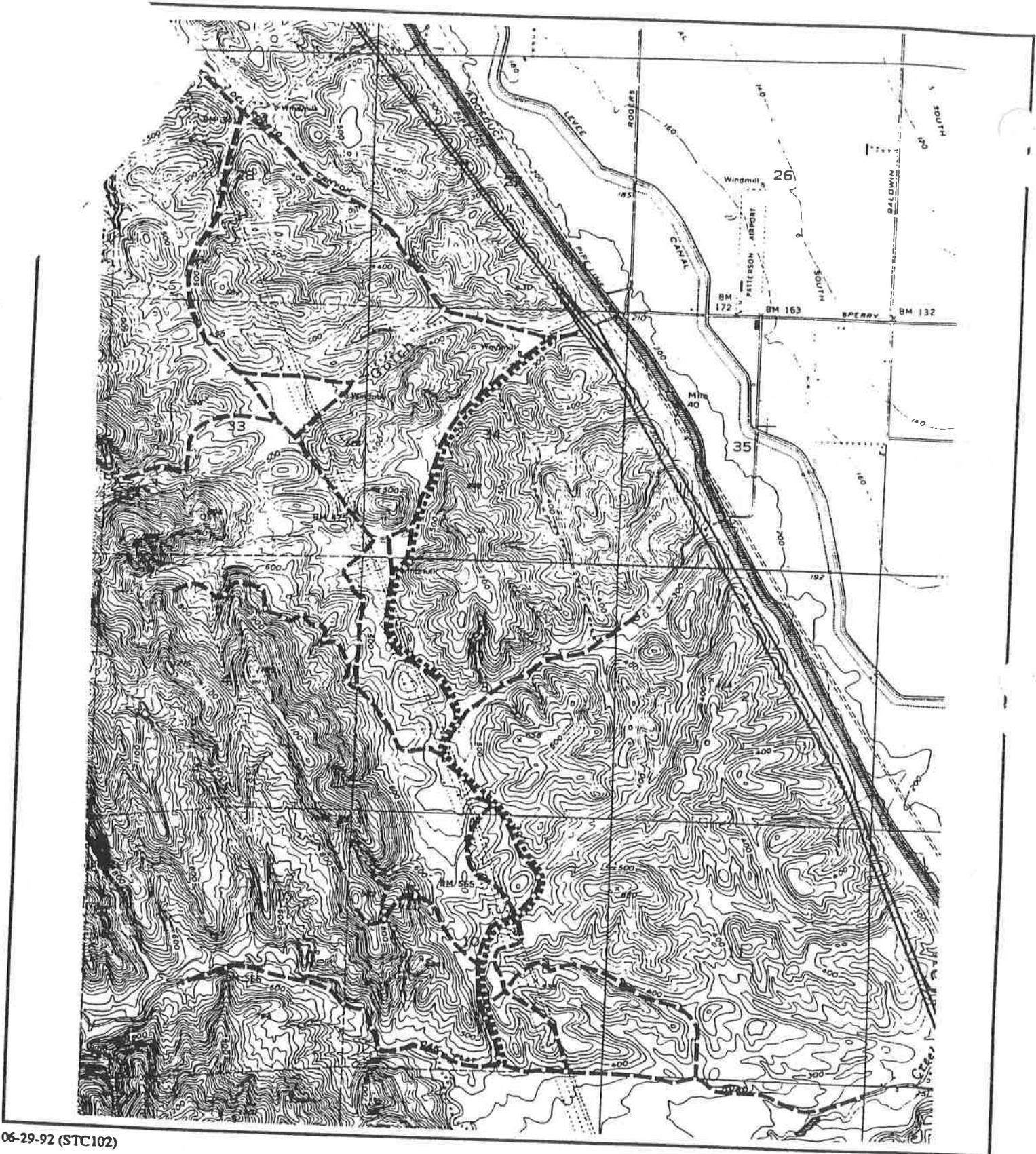
Eleven of the scent stations consisted of two plates of .040 inch thick aluminum placed together to form a square one-by-one meter. The plates were coated with a layer of kerosene soot at the time they were placed in the field in order to record animal footprints. The remaining four stations were set up by clearing a circle of ground approximately 40 inches in radius and covering it with a one-half inch thick layer of diatomaceous earth, smoothed by putting down a sheet of plastic and sweeping with a broom. Stations were baited with chicken- or beef-based canned cat food which was placed at the center of each station. Stations were re-baited, and plates resooted or diatomaceous earth swept smooth each afternoon and checked the following morning for tracks. Track identification was aided by reference to standard field guides (Murie 1974, Halfpenny 1986) and the field experience of the biologists.

### ***Spotlighting Surveys***

Spotlighting surveys were conducted on all accessible roads along the road corridor and up to two miles away on June 2, 3, 4, 5, 9, 10, 12, and 16 (Figure 3). Surveys on June 2 and 3 were limited to the northern one-third of the road corridor and surrounding roads due to access problems. The entire road corridor was surveyed on the remaining nights. Surveys took place after sunset, usually between 21:00 and 01:00 PST. Surveys were conducted by vehicle, driving five to ten miles per hour, with both the driver and passenger illuminating the areas to the front and sides of the vehicle with 400,000 candle power spotlights. The vehicle was stopped when eyeshine or movement was observed, and animals were identified by using 7 X 35 binoculars and a 20 power spotting scope. The species, time, and location of each observation were recorded.

### ***Ground Transects***

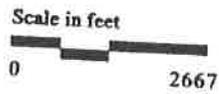
Daytime ground surveys were conducted on foot to locate kit fox dens and other signs of kit fox presence. The entire length of the access road and a corridor extending 300 feet on either side of the centerline was systematically covered by a pair of biologists walking approximately 100 feet apart. All potential dens were measured, examined for tracks, scat, fresh diggings, and prey remains, and mapped. Any burrow in suitable habitat with the appropriate size and shape was considered to be a potential den. Particular attention was given to burrow aggregates of California ground squirrels (*Spermophilus beecheyi*). Den surveys were conducted on June 3, 10, 17, 18, and 19.



06-29-92 (STC102)



**LSA**



-  Areas Spotlighted
-  Proposed Road

Figure 3

Access Road and Routes and Areas Spotlighted

### ***Remote Camera Stations***

Camera stations used Trailmaster systems. This weatherproof equipment including a 35mm camera, an infrared beam transmitter, and a receiver. This equipment was strapped to one-inch by two-inch stakes driven into the ground with the transmitter aimed at the receiver and camera. The breaking or blocking of the infrared beam would automatically trigger the camera to take a picture. A can of cat food was placed between the transmitter and receiver and the camera was aimed so any animal attracted to the bait would break the beam and be photographed. Camera stations automatically activated themselves from dusk until dawn and were checked daily. If the system indicated that photographs had been taken during the night the film was removed and developed at a one-hour processor.

Six camera stations were established along the road corridor (Figure 2). On June 3 and 4 two stations were set up and checked. The remaining four stations were set up on June 5, and all six stations were then monitored for six more nights.

## ENVIRONMENTAL SETTING

The proposed access road is located near the edge of the eastern foothills of the Diablo Range, in southwestern Stanislaus County. It is about 20 miles southwest of Modesto and three miles southwest of Patterson. The road corridor is located along the floor of a series of valleys bordered by gently-sloping to steep ridges. The road crosses three saddles to reach adjacent valleys. Land use within and adjacent to the road corridor is livestock grazing. A major electrical transmission line corridor and petroleum pipeline roughly parallel the road corridor. A series of dirt access roads traverse the area.

## PLANT COMMUNITIES

The predominant vegetation of the hillsides and valley floors of the road corridor is non-native grassland. Non-native grasslands are generally characterized by a dense cover of herbaceous annuals, dominated by non-native grasses, such as wild oats (*Avena* spp.) and bromgrasses (*Bromus* spp.) (Holland 1986). Small areas of tall herbaceous annuals characterized by mustard (*Brassica* spp.), are present with the non-native grassland.

Alkaline wetlands, primarily Alkali Meadow and Alkali Grassland, are present in the northern portion of the site along the valley floor of the drainage which flows into Del Puerto Canyon Creek. Alkali Meadows are generally characterized by perennial grasses including saltgrass (*Distichlis spicata*) and alkali sacaton (*Sporobolus airoides*) (Holland 1986). Alkali Grassland is generally 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.) (Holland 1986).

## SAN JOAQUIN KIT FOX BIOLOGY AND HABITAT REQUIREMENTS

Information on kit fox biology is abstracted from reviews by O'Farrell (1983) and Orloff (1990), unless otherwise noted. More detailed information can be obtained by referring to these reviews.

### *Distribution*

The distribution of San Joaquin kit foxes in California includes Alameda, Contra Costa, Fresno, Kern, Kings, Merced, Monterey, San Benito, San Joaquin, San Luis Obispo, and Santa Barbara Counties (USFWS 1990). Morrell (1975) estimated the size of the San Joaquin kit fox population in 1975 to be between 5,000 and 14,800 individuals, with an average of 10,000. O'Farrell (1983) later revised the estimate to around 7,000.

### **Habitat**

San Joaquin kit foxes generally inhabit areas where slopes are less than 40 percent. They prefer valley and foothill areas supporting Saltbush Scrub and Non-Native Grassland. Blue Oak Woodland and wetlands may provide marginal habitat. The Non-native Grassland within the road corridor provides suitable kit fox habitat.

### **Food**

Kit foxes primarily prey upon black-tailed jackrabbits, desert cottontails, kangaroo rats, and, especially in the northern part of their range, California ground squirrels<sup>1</sup>. They are also opportunistic and will prey on birds, reptiles, and arthropods and will scavenge for carrion, particularly road kills.

### **Pups**

Litters ranging in size from 3 to 5 pups are born in late February to March. In the northern part of their range, pups appear to be born during the middle of March. One litter of pups is born each year. The pups emerge from the den at about one month old, and both parents help raise the young. Pups generally disperse by October, when family groups begin to split up.

### **Den Characteristics**

Kit foxes in the northern portion of their range primarily den in the enlarged burrows of California ground squirrels or in unoccupied dens of other species such as American badger (*Taxidea taxus*). California ground squirrel burrows are present throughout the road corridor and active badger dens were observed. San Joaquin kit foxes do not den in wetland soils, and those portions of the project site with alkaline wetlands appear unsuitable for denning.

Kit fox dens are most often found on gentle slopes (less than 28 percent), with natal and pupping dens on more level ground. None of the slopes in the project area appear to be too steep for kit fox den sites, and the lower slopes and upland portions of the valley bottoms appear suitable for natal and pupping den sites.

Dens have one to several entrances. The entrances range from 4 to 10 inches in diameter and are usually taller than wide. Dens used for escape or daily shelter are more common and are generally smaller than natal dens. Active

<sup>1</sup>Unless otherwise noted in the text, see Appendix for scientific names of animals.

dens may show signs of activity, such as recent digging, tracks, fresh scat, fleas and flies, or prey remains. Such signs are frequently absent at active dens, in the northern portion of the range however; so any burrow in suitable habitat with the appropriate size and shape is considered to be a potential den. Potential dens serve as escape cover, even if not used for other activities.

Family groups and individuals will use several dens throughout the year, and families may change natal dens once or twice per month. Individual foxes may use up to two dozen dens, and any particular den is therefore likely to be vacant. Natal dens are used in successive years by the same mated pair or family group, and natal den sites may be used by successive generations of foxes.

## RESULTS AND DISCUSSION

### *HISTORICAL OCCURRENCE IN PROJECT VICINITY*

WESCO reported a sighting of a kit fox on the nearby Lakeborough project site in 1989. The location was off of Fink Road just west of Highway 5 approximately two and one-half miles south of Oak Flat road. Other sightings are contained in the CNDDDB (1992). Swick observed an active den and kit fox individuals in 1973, approximately 11 miles north of the site, south of Hospital creek where the transmission line corridor crosses Bird Road. To the south, a den and several kit fox individuals were observed between 1972-1975 by Morrell in the southeast portion of Bennett Valley south of Sullivan Road, approximately 12 miles south of the Oak Flat Road.

### *FINDINGS*

No positive evidence of recent San Joaquin kit fox activity was detected by LSA biologists during our summer 1992 survey of the access road corridor. An unidentified small fox was observed in the area adjacent to the northern end of the access road. A number of other animal species were encountered during the survey (Tables A and B).

#### *Scent Stations*

No positive kit fox tracks were detected at the scent stations. The tracks of other animal species recorded at the stations are presented in Table A.

No canid tracks were found on any of the scent stations. Coyote tracks were seen in the fine dust along the road near several of the scent stations almost daily.

Mustelid tracks were observed on eight station-nights. Tracks one and one-half to two inches long were identified as striped skunk tracks (spotted skunks have smaller tracks with shorter claws). There were also tracks longer than two inches found in the road dust, they were identified as probably badger tracks.

Raccoon tracks were observed on one station night. Tracks two to three inches long were identified as racoon with their five-fingered prints. Raccoon tracks were also found in the road dust. Almost all of the skunk and racoon tracks were noted at the south end of the access road near the cherry orchard, and Salado Creek.

Table A - Diablo Grande Access Road Scent Station Data  
June 2 through June 16

Scent Station Numbers	Dates							
	6/3	6/4	6/5	6/6	6/10	6/11	6/12	6/13
1	SKUN	*	MOUS	MOUS	MOUS	MOUS	MOUS	MOUS
2	*	*	*	*	*	*	*	*
3	*	CGSQ	UNSO, CGSQ	MOUS, UNSO, CGSQ	MOUS, CGSQ	*	MOUS, CGSQ	MOUS, CGSQ
4	MOUS	MOUS	MOUS, CGSQ	MOUS	MOUS	MOUS	MOUS	MOUS
5	MOUS, CGSQ	MOUS	MOUS	CGSQ, MOUS	RABB, CGSQ, MOUS	MOUS, CGSQ	MOUS	MOUS, CGSQ
6			*	MOUS	RABB, MOUS	MOUS, CGSQ, RABB	MOUS	MOUS
7			MOUS	MOUS	MOUS	*	MOUS	MOUS
8			CGSQ, UNSO	MOUS, CGSQ	MOUS	MOUS, CGSQ	UNSO, MOUS	MOUS, UNSO
9			CGSQ, UNSO, MOUS, SKUN	RABB, UNSO, MOUS	MOUS, RABB, UNSO	MOUS, CGSQ, UNSO	RABB	MOUS, CGSQ
10			MOUS	MOUS	*	*	*	MOUS
11			*	MOUS	MOUS, CGSQ	*	CGSQ	MOUS, CGSQ
12			MOUS	MOUS, CGSQ	MOUS	CGSQ	CGSQ, SKUN	CGSQ, MOUS, SKUN
13			KRAT, MOUS, RAVE	MOUS, CGSQ, KRAT	RAVE, MOUS, CGSQ	RAVE, CGSQ	MOUS, SKUN, CGSQ, RAVE	RAVE, SKUN, CGSQ
14			RACO, MOUS, RAVE, CGSQ	MOUS, CGSQ	MOUS, KRAT	RAVE, KRAT, MOUS	SKUN	STBU
15			MOUS, CGSQ	RAVE, MOUS, CGSQ	KRAT	MOUS	SKUN, RAVE	RAVE, UNSO

LEGEND:  
 SKUN = Striped Skunk  
 RACO = Raccoon  
 CGSQ = California ground squirrel  
 KRAT = Kangaroo rat  
 MOUS = Mouse sp.  
 RAVE = Raven  
 UNSO = Unidentified songbird  
 \* = No tracks  
 STBU = Station blown indistinguishable  
 RABB = Rabbit

**Table B - Diablo Grande Access Road Spotlighting Data  
June 2 through June 16**

Species	Dates							
	6/2	6/3	6/4	6/5	6/9	6/10	6/12	6/16
Coyote				1	1			
Unidentified canid						1		
Unidentified fox					1			
House cat	1	1						
Badger							1	
Raccoon	1							
Striped skunk	1							
Black-tailed deer	4							
Desert cottontail	6			5	1	4	13	
Kangaroo rat	1	7	2	2		1	2	8
Rodent sp.	1	5	8	12		2	4	10
Red-tailed hawk							3	
Common barn owl	1			2	1	10	3	2
Common raven							1	
Horned lark			2	3	3	2		
Western toad				4				2
Common kingsnake				1				

### ***Spotlighting Surveys***

No kit foxes were observed positively during the spotlighting survey. On June 9, an unidentified fox was observed on the north side of Del Puerto Canyon road opposite (to the north) of the entrance gate to the access road. Pursuit and observation with a hand-held 500,000 candlepower spotlight for about 20 minutes did not clearly identify the animal. It was determined that the fox was not a red fox (*Vulpes vulpes*), a fox which also occurs in grassland habitats in the vicinity of the project site. We conclude that the fox observed was potentially a kit fox.

A single coyote was observed on two nights. An unidentified canid which was too distant to make a positive identification was observed. Other carnivores observed included badger, racoon, striped skunk, house cat, red-tailed hawk, common barn owl, and common kingsnake. Lagomorph and rodent species observed included desert cottontails, kangaroo rats, and several species of mice. A complete record of animals sighted during the spotlighting survey is given in Table B.

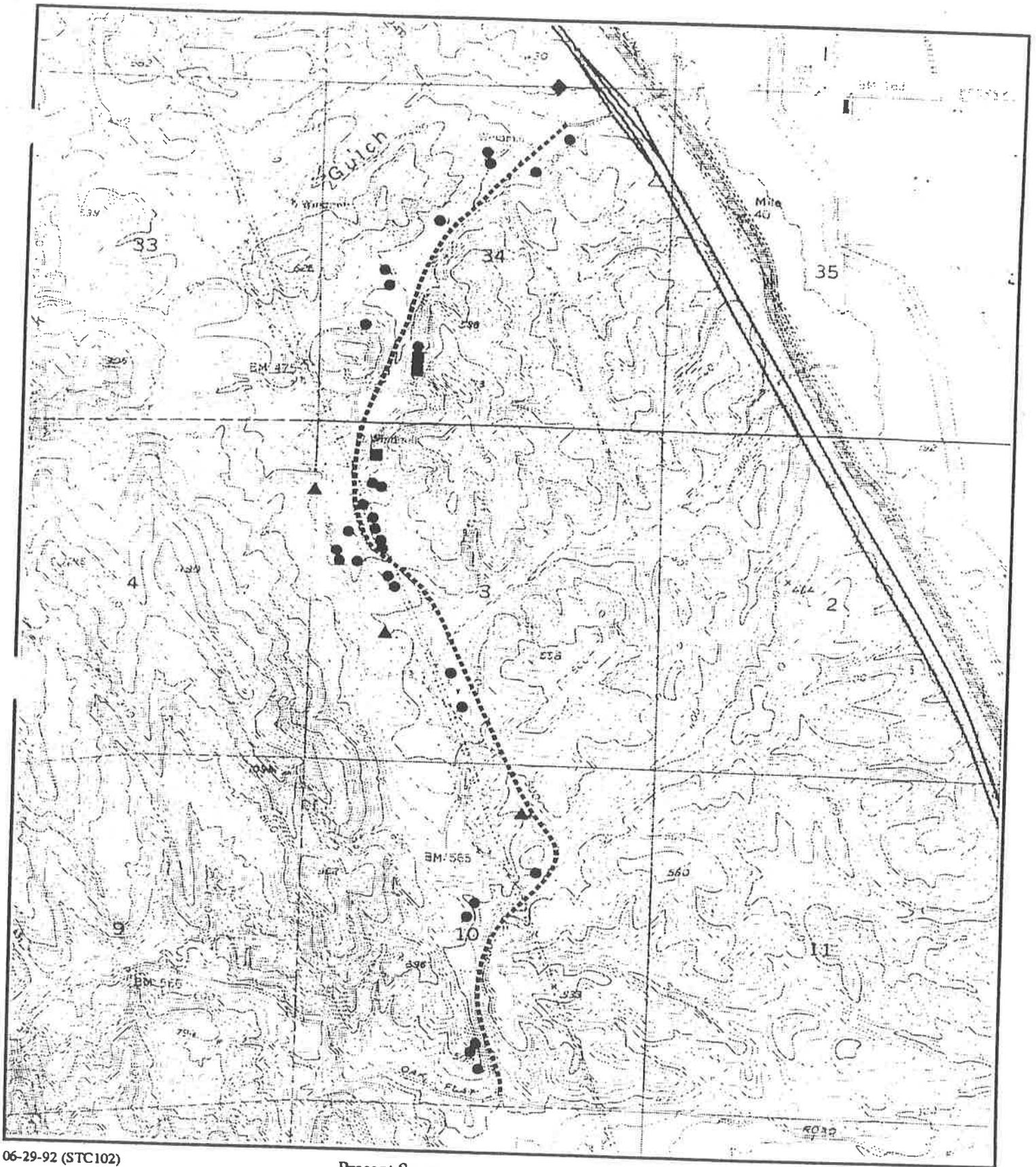
### ***Ground Transects***

No positively identified kit fox dens, defined as dens which have evidence of present or past use by kit foxes, were located on the project site during the ground survey. Thirty potential kit fox dens, as defined in the methods section, were found and their locations are shown in Figure 4. These potential dens had entrance holes of five to 12 inches in diameter and tunnels which extended at least two and one-half feet into the ground, as determined visually or by using a steel tape measure. Den entrance shape varied from circular, to taller-than-wide, to wider-than-tall.

Nearly all of the potential dens located on the project site showed evidence of present or past used by California ground squirrels or badgers. Ground squirrels were fairly abundant throughout the road corridor, and some of the potential dens showed recent evidence of ground squirrel activity, including sightings of ground squirrels in potential dens and the presence of squirrel tracks and scat around the entrances to potential dens. Evidence of badger activity included scat and large claw marks on the sidewalls of potential dens.

### ***Remote Camera Stations***

No photographs of kit foxes were taken. The camera stations were operated for eight nights. The camera stations were checked daily to see if they would take photographs by intentionally breaking the beam. The only animal photographed during the survey was a desert cottontail.



06-29-92 (STC102)

**Present Survey**

- Potential Kit Fox Dens
- Active Badger Dens
- ▲ Coyote Sightings
- ◆ Unidentified Fox Sighting
- Proposed Road



**LSA**

Scale in feet  
 0 ————— 2000

Figure 4

Locations of Potential Kit Fox Dens,  
 Active Badger Dens, Coyote Sightings,  
 and an Unidentified Fox Sighting

**DISCUSSION**

Suitable habitat exists for the San Joaquin kit fox along the entire road corridor. Grasslands are the primary habitat for the San Joaquin kit fox in the northern portion of its range, and grassland forms the plant cover for virtually the entire road corridor. The valley bottoms and lower hill slopes provide suitable potential denning areas. Prey appears to be available, including ground squirrels, cottontails, and kangaroo rats. A sufficient number of potential dens are present that kit foxes could use for shelter. Badger holes are present, providing an additional source of dens.

The presence of suitable habitat, together with the fact that the species has been observed in the vicinity of the road site in the recent past indicates that kit foxes are present in the area and will use the project site. The road corridor is located in the narrow band of suitable kit fox habitat located on the western side of the San Joaquin Valley which serves as a corridor linking populations at the northern end of its range with populations in the Los Banos area.

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## APPENDIX

VERTEBRATE SPECIES OBSERVED WITHIN THE  
DIABLO GRANDE ACCESS ROAD CORRIDOR

Common Name	Scientific Name
<b>AMPHIBIANS</b>	
Western toad	<i>Bufo boreas</i>
<b>REPTILES</b>	
Side-blotched lizard	<i>Uta stansburiana</i>
Western fence lizard	<i>Sceloporus occidentalis</i>
Gopher snake	<i>Pituophis melanoleucus</i>
Racer (snake)	<i>Coluber constrictor</i>
Western rattlesnake	<i>Crotalus viridis</i>
<b>BIRDS</b>	
Killdeer	<i>Charadrius vociferus</i>
Turkey vulture	<i>Cathartes aura</i>
Northern harrier	<i>Circus cyaneus</i>
Red-tailed hawk	<i>Buteo jamaicensis</i>
American kestrel	<i>Falco sparverius</i>
Common barn owl	<i>Tyto alba</i>
Western kingbird	<i>Tyrannus verticalis</i>
Say's phoebe	<i>Sayornis saya</i>
Horned lark	<i>Eremophila alpestris</i>
Cliff swallow	<i>Hirundo pyrrhonata</i>
Barn swallow	<i>Hirundo rustica</i>
Yellow-billed magpie	<i>Pica nuttalli</i>
American crow	<i>Corvus brachyrhynchos</i>
Common raven	<i>Corvus corax</i>
Rock wren	<i>Salpinctes obsoletus</i>
Loggerhead shrike	<i>Lanius ludovicianus</i>
Western meadowlark	<i>Sturnella neglecta</i>
Brewer's blackbird	<i>Euphagus cyanocephalus</i>
House finch	<i>Carpodacus mexicanus</i>

<b>Common Name</b>	<b>Scientific Name</b>
<b>MAMMALS</b>	
Coyote	<i>Canis latrans</i>
Badger	<i>Taxidea taxus</i>
Raccoon	<i>Procyon lotor</i>
Striped skunk	<i>Mephitis mephitis</i>
Desert cottontail	<i>Sylvilagus audubonii</i>
Botta's pocket gopher	<i>Thomomys bottae</i>
California ground squirrel	<i>Spermophilus beecheyi</i>
Kangaroo rat	<i>Dipodomys sp.</i>
California vole	<i>Microtus californicus</i>
Pocket mouse	<i>Perognathus sp.</i>
Deer mouse	<i>Peromyscus sp.</i>

## APPENDIX E: PATTERSON AREA GROUNDWATER STUDY

**CITY OF PATTERSON  
PATTERSON, CALIFORNIA**

**RECONNAISSANCE EVALUATION OF GROUND WATER RESOURCES  
AVAILABLE TO THE CITY OF PATTERSON**

**Bookman-Edmonston Engineering, Inc.  
Sacramento, California**

**August 1991**

## RECONNAISSANCE EVALUATION OF GROUND WATER RESOURCES AVAILABLE TO THE CITY OF PATTERSON

The City of Patterson is located within Stanislaus County on the western edge of the San Joaquin Valley, approximately 13 miles southwest of Modesto. The city has a current population of about 9,000 and within its draft general plan is anticipating potential growth up to a total population of about 21,000 by the year 2010. The purpose of this memorandum is to evaluate the ground water supplies available to the City of Patterson and (on a preliminary basis) determine if the ground water resources alone are sufficient to support this level of growth. This memorandum is organized into subsections which individually consider the geology and hydrology of the Patterson area. Based on this evaluation, it is concluded that ground water resources are sufficient to allow the projected increase in population.

### Geology

Geologic features of the ground water basin underlying the City of Patterson were evaluated by reference to published reports, particularly a 1971 USGS Open File Report, "Geology Hydrology and Water Quality of the Tracy-Dos Palos Area", and USGS Water Supply Papers 1469 and 1618. The geology underlying the City of Patterson can best be described by an understanding of its relationship to the overall geology of the Central Valley, which is bordered on the east by the Sierra Nevada and on the west by the Coast Range. This valley is a topographic and structural basin which has been filled with a thick sequence of marine and continental sedimentary deposits. Attachment 1 illustrates a generalized geologic cross-section in the general vicinity of Patterson showing the substantial thickness of both marine and continental sediments. As also shown, the fresh water resources are limited to the upper portions of the continental sediments. The principal water-bearing deposits in this vicinity are sands and silts containing lenses of poorly sorted coarse sands and gravels.

Typically, the deposits become more fine-grained proceeding easterly from the Coast Range, with floodplain, lacustrine and marsh deposits underlying the valley trough. Available

data indicate that the deposits underlying the City of Patterson are westerly of the geologic trough of the Central Valley. Several clay or silty clay "tongues" extend out of these deposits, which were deposited in widespread prehistoric lakes.

The most extensive of these clays, commonly termed the "E" clay or the "Corcoran" clay, occurs beneath the City of Patterson and in the adjacent areas. USGS Water Supply Paper 1469 indicates the clay occurs at an elevation of about 150 feet below sea level. The USGS Open File Report indicates that the E-clay is about 40 to 60 feet thick in the vicinity of Patterson, and the top of the clay occurs at an approximate depth of 150 feet.

Shown on Attachment 2 is a more detailed cross section located south of the City of Patterson. The section shows that the E-clay eventually pinches out toward the western and eastern margins of the basin. Areas to the east and, to a lesser extent, to the west serve as the "forebays" to the confined deposits below the E-clay. The extensive quantities of water beneath the E-clay are under pressure due to hydraulic continuity with the forebay areas.

The Open File Report defines various lithofacies, soil classifications based on the percentage of coarse-grained materials. Materials above the E-clay in the vicinity of the City of Patterson belong to lithofacies c, d and e with coarse-grained material comprising from 33 to 80 percent of the deposits. Materials below the E-clay belong to lithofacies b and c, with coarse-grained material comprising 20 to 50 percent of the deposits.

### Hydrology

Ground water apparently occurs in the Patterson area under both unconfined and confined conditions, with the E-clay constituting a known confining layer. Semi-confined conditions have also been reported which can result from partial confinement beneath clays of limited lateral extent and hydraulic thickness. In particular, a "white clay" has been identified (located above the E-clay) which also can provide confinement.

Movement of ground water can be assessed by evaluating water levels with ground water movement occurring from areas of high levels to areas with relatively depressed levels. Shown on Attachment 3 are ground water levels in the unconfined aquifer in the vicinity of the City of Patterson as contoured by the DWR for the year 1987. These contours indicate ground water movement beneath Patterson from the Coast Range towards the San Joaquin River. In 1952,

water level data presented in USGS Water Supply Paper No. 1469 indicate that the unconfined to semi-confined ground water body received substantial replenishment from canals carrying water diverted from the San Joaquin River, which built a ground water mound beneath Highway 33, extending from Orestimba Creek to approximately the City of Patterson.

Contours of 1952 water levels for the confined system presented in USGS Water Supply Paper No. 1469 indicated a generally southwesterly flow towards a depression near the edge of the basin. The USGS noted that gradients southwest of this trough are substantially steeper than those in the Patterson area and inferred that this indicated little replenishment is derived from the west. Data were not sufficient in that study to determine if two separate ground water bodies occur in this trough area southwest of Patterson or whether the confined layers are less effective in this area and that there is a single merged ground water body. Attachment 4 (from the Open File Report) shows water level elevations within the confined aquifer system in the vicinity of Patterson. These contours indicate general ground water movement from southwest to northeast, with a relatively sharp gradient into the Patterson area.

Attachments 5 and 6 show locations and hydrographs of selected wells in the vicinity of the City of Patterson. These wells demonstrate relatively stable water level conditions.

Construction characteristics (particularly well depths and perforated intervals) of the City of Patterson wells were compared to the depth to the E-clay. Based on this evaluation, it appears that the City's wells are composite wells (drawing water from both confined and unconfined aquifers). Water Supply Paper 1618 contains a tabulation on yield characteristics of irrigation wells. For Township 5 South, Range 8 East (which contains the City of Patterson), three tests were available which indicated an average specific capacity of 18 gallons per minute (gpm) per foot of drawdown. This indicates a transmissivity on the order of about 27,000 to 36,000 gallons per day per foot. Well data are also available in the Open File Report. For Township 5 South, Range 8 East, the average specific capacity for wells completed above the E-clay was about 30 gpm per foot. Data for a well extending below the E-clay indicated a specific capacity of about 12 gpm per foot.

Water Supply Paper 1618 also contained an estimate of the specific yield for study subareas. The study subarea containing the City of Patterson (Tracy-Patterson subarea) had an average specific yield of about 10.6 percent for a depth interval between 10 and 200 feet.

### Hydrologic Balance

Performance of a hydrologic balance requires estimation of the elements of supply and demand for a given area in order to determine if there is a surplus or a deficit in the water supply. A previously performed hydrologic balance for the area of interest appears to currently not exist. However, some hydrologic evaluations were available for relatively large areas which include the City of Patterson. DWR Bulletin 118-80 defined various ground water basins within the San Joaquin Valley, based largely on institutional and water management considerations. Patterson is contained within the Delta-Mendota Basin. This bulletin also identified basins "subject to critical conditions of overdraft"; however, the Delta-Mendota Basin was not classified as such.

Hydrologic data were also developed as a part of the DWR's ground water modeling effort. For the model, the Valley was subdivided into detailed analysis units (DAU's) for which hydrologic balances were prepared (except for the ground water flow component which was computed in the model). The City of Patterson is contained within DAU 216. Shown on Attachment 7 is the hydrology used for DAU 216. A brief examination of this hydrology indicates that for almost all years recharge to the ground water exceeds the total ground water pumpage. This implies that any imbalance which does exist in this area would be attributable to a net ground water outflow from the area rather than a lack of recharge to support the ground water pumping.

The City of Patterson is anticipating growth into the adjoining lands contained within the Patterson Water District, West Stanislaus Irrigation District and Del Puerto Water District. Patterson Water District encompasses approximately 14,000 acres and is generally located north, south, and east of the City of Patterson. The Patterson Water District serves irrigation demands within its boundaries through a combination of San Joaquin River diversions and a contractual surface water supply from the Central Valley Project (Delta-Mendota Canal). Typically, the District delivers about 45,000 acre-feet per year.

The West Stanislaus Irrigation District lies westerly of the City of Patterson and delivers water for irrigated agriculture. The District's water supplies include diversions from the San Joaquin River and also a contractual surface water supply from the Central Valley Project. In

addition, the District owns and operates four deep wells. The Del Puerto Water District receives a contractual surface water supply (12,060 acre-feet per year) from the Central Valley Project.

The districts are largely developed to irrigation, with only about 1500 people within the Patterson Water District and 3500 within the West Stanislaus Irrigation District. Therefore, relatively small demands for water for non-irrigation uses occur within these districts. Further, the districts deliver substantial quantities of surface water, indicating limited reliance on ground water resources on average.

A hydrologic balance for the local affected area was developed as follows:

Potential recharge from applied water within the districts was estimated assuming 25 percent of the applied water would percolate to the ground water. This assumption equates to a ground water recharge of 35,000 acre-feet per year. Current ground water extractions from this area include approximately 1600 acre-feet per year for the City of Patterson, approximately 700 acre-feet per year estimated for domestic use within the two districts (based on a population of 5,000) and approximately 13,000 acre-feet per year pumped from the West Stanislaus Irrigation District Wells (estimated assuming 2000 gpm per well which would be operated at a 50 percent load factor). This results in a total estimated ground water demand for this area of about 15,000 acre-feet per year. The comparison between ground water recharge and demand indicates that return flows from irrigation exceed ground water demands. Even as irrigated lands are converted to urban use, the balance of potential ground water recharge to ground water extraction remains positive.

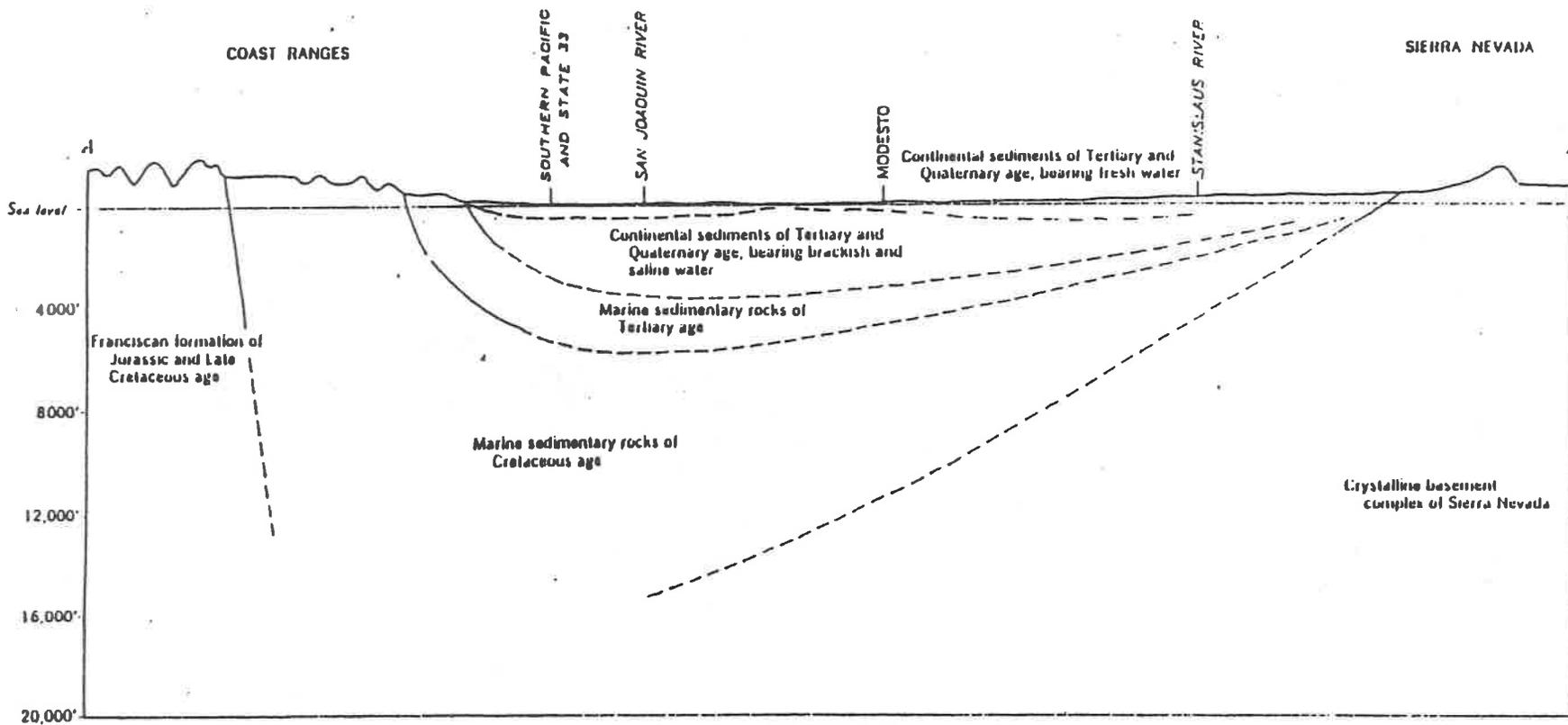
#### Evaluation of Ground Water Supply

The data presented above indicates that (on a reconnaissance level) ground water supplies will be adequate to fully meet increases in water demands in the City of Patterson to the currently planned population of 21,000. Available data indicate most of the water demands on the adjoining lands are met with surface water supplies and it is roughly estimated that the return flows from irrigation exceed the anticipated average annual demand for ground water in the area. These results are consistent with DWR Bulletin 118-80, with hydrology for model DAU 216 and with hydrologic data contained in the USGS Open File Report. This is also supported by the stable water levels in wells in the vicinity of Patterson. The above does not consider underflow

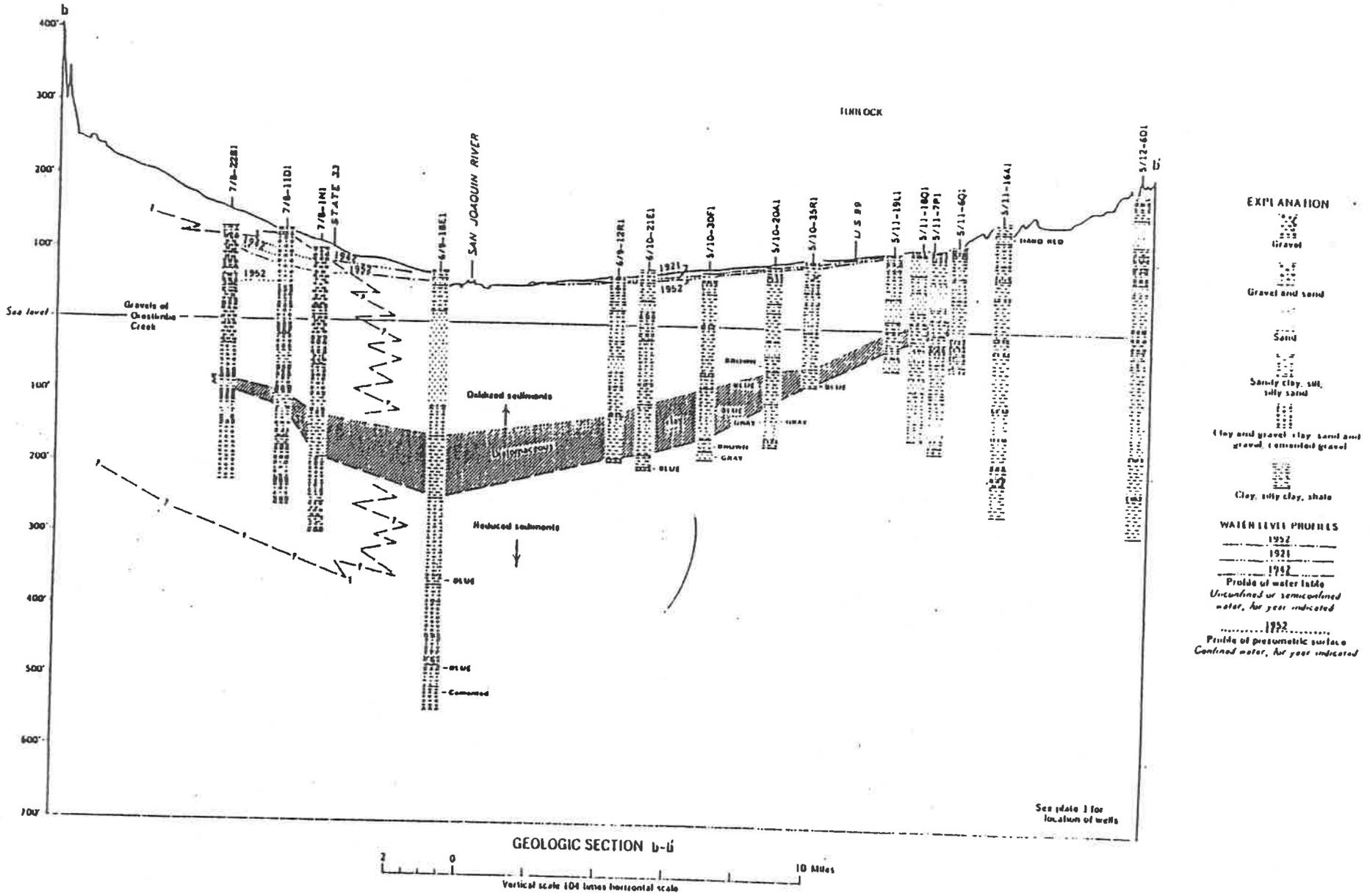
into or out of the area, but the substantial return flows do indicate that sufficient ground water recharge is available within this area to support additional extractions. Further, the additional extractions anticipated for the City are minimal in relation to the available ground water resource.

It should be noted that, while the overall hydrologic balance for the area appears to be favorable, the substantial direct recharge in the area largely contributes to the unconfined aquifer system and available data are not sufficient to fully describe the relationship between the unconfined and confined aquifers. A potential concern for expanded use of ground water would be water quality. City of Patterson water data indicate the City's wells have met all EPA and Department of Health Services standards to date. However, available data indicates that some of the ground water near the City of Patterson exceeds secondary drinking water standards for TDS, chloride and sulfate and care in selecting zones for well perforations will be needed.

SAN JOAQUIN VALLEY

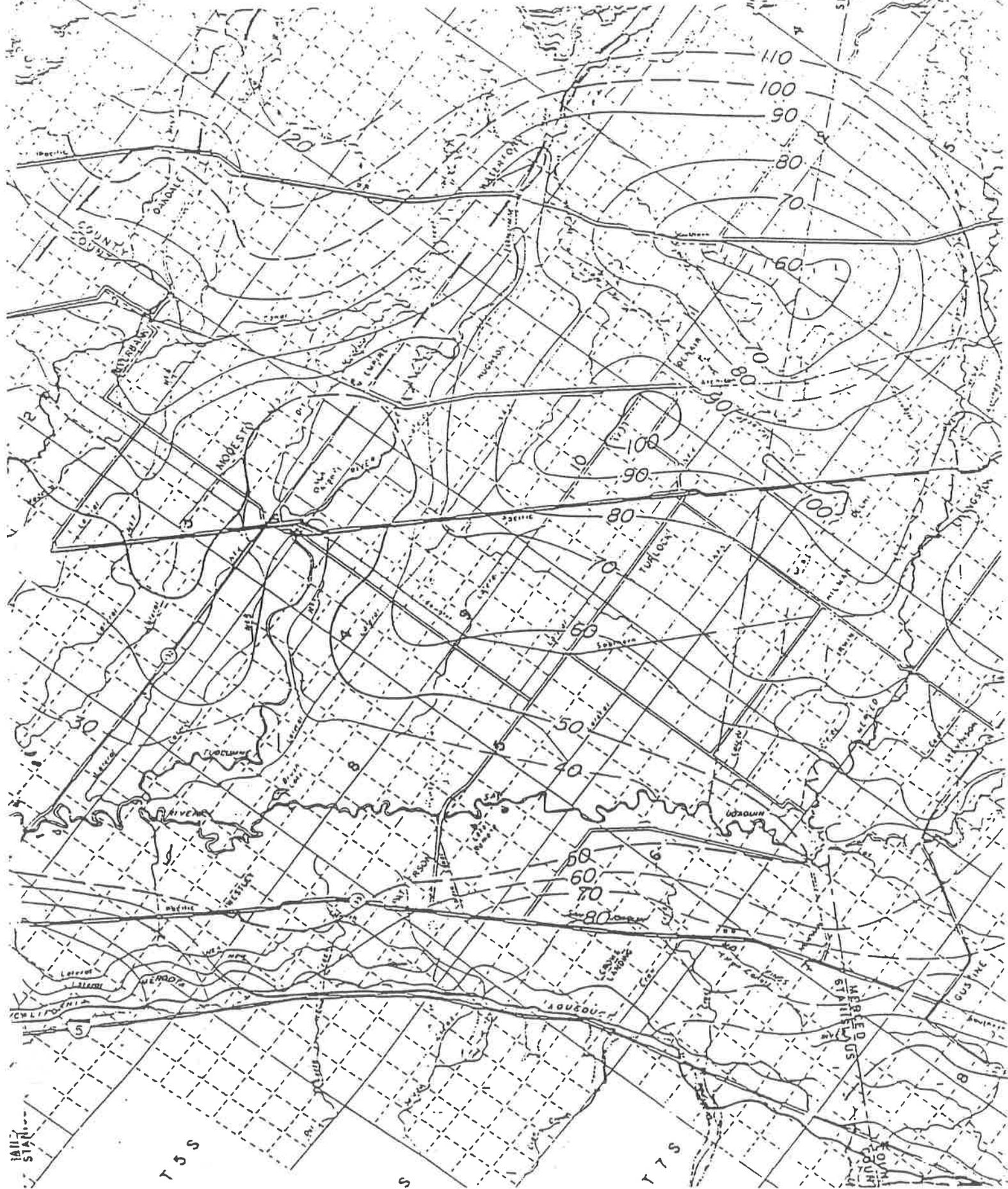


SECTION A-A'

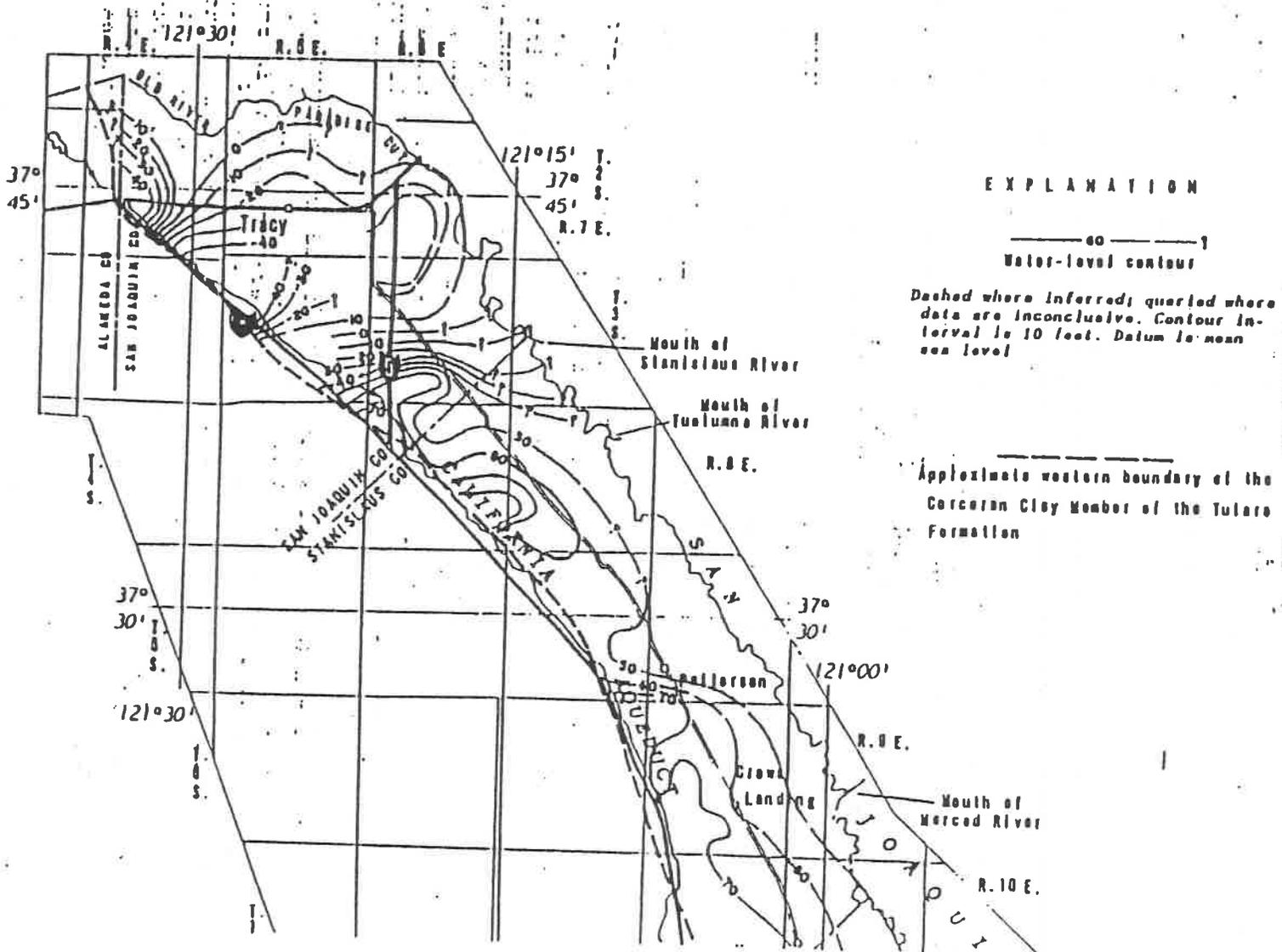


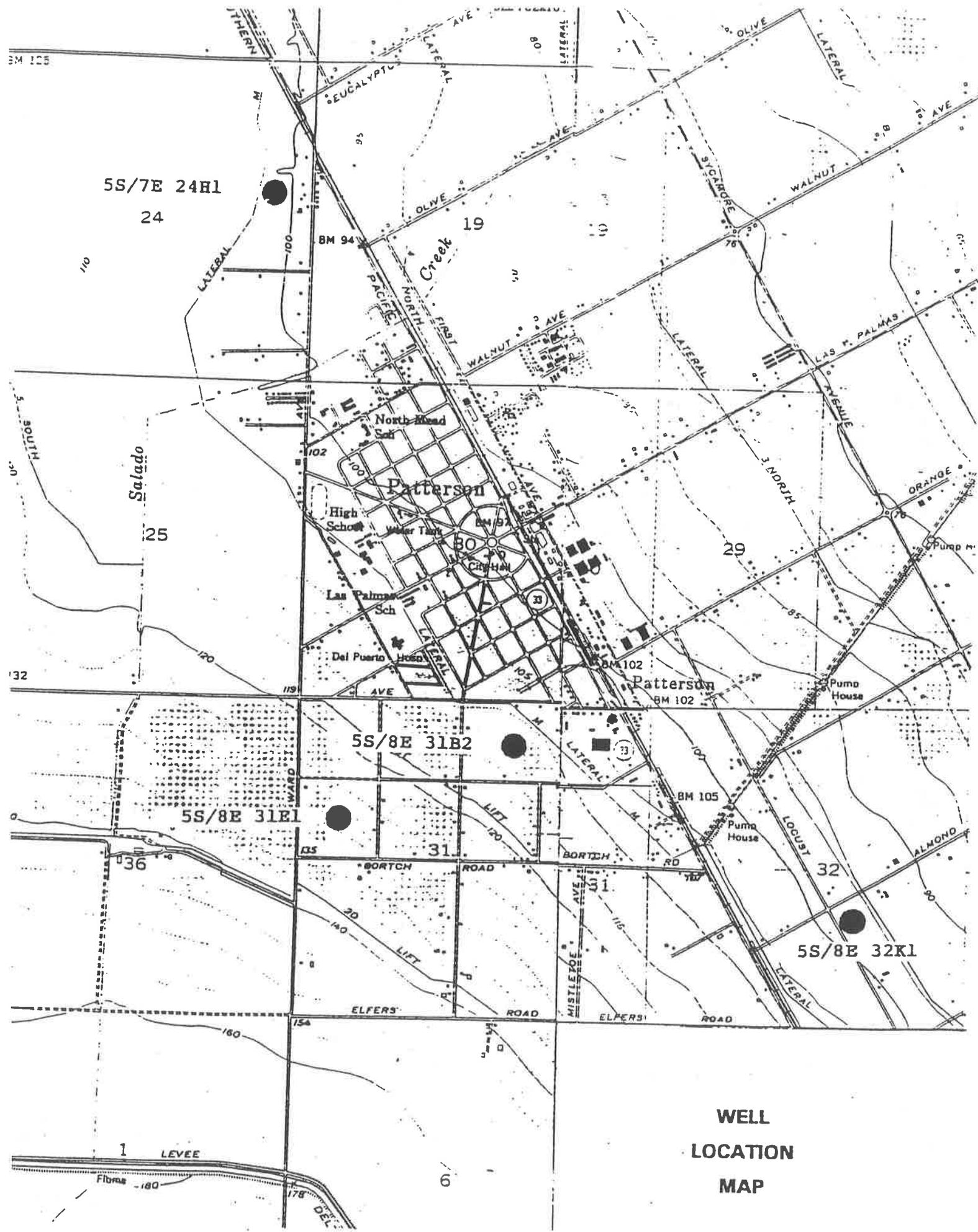
448411 10 - 55 (10 100 60)

Water level elevations in unconfined aquifer, Spring 1987  
From California Department of Water Resources



Source: USGS Open File Report "Geology, Hydrology and Water Quality of the Tracy-Dos Palos Area", 1971.

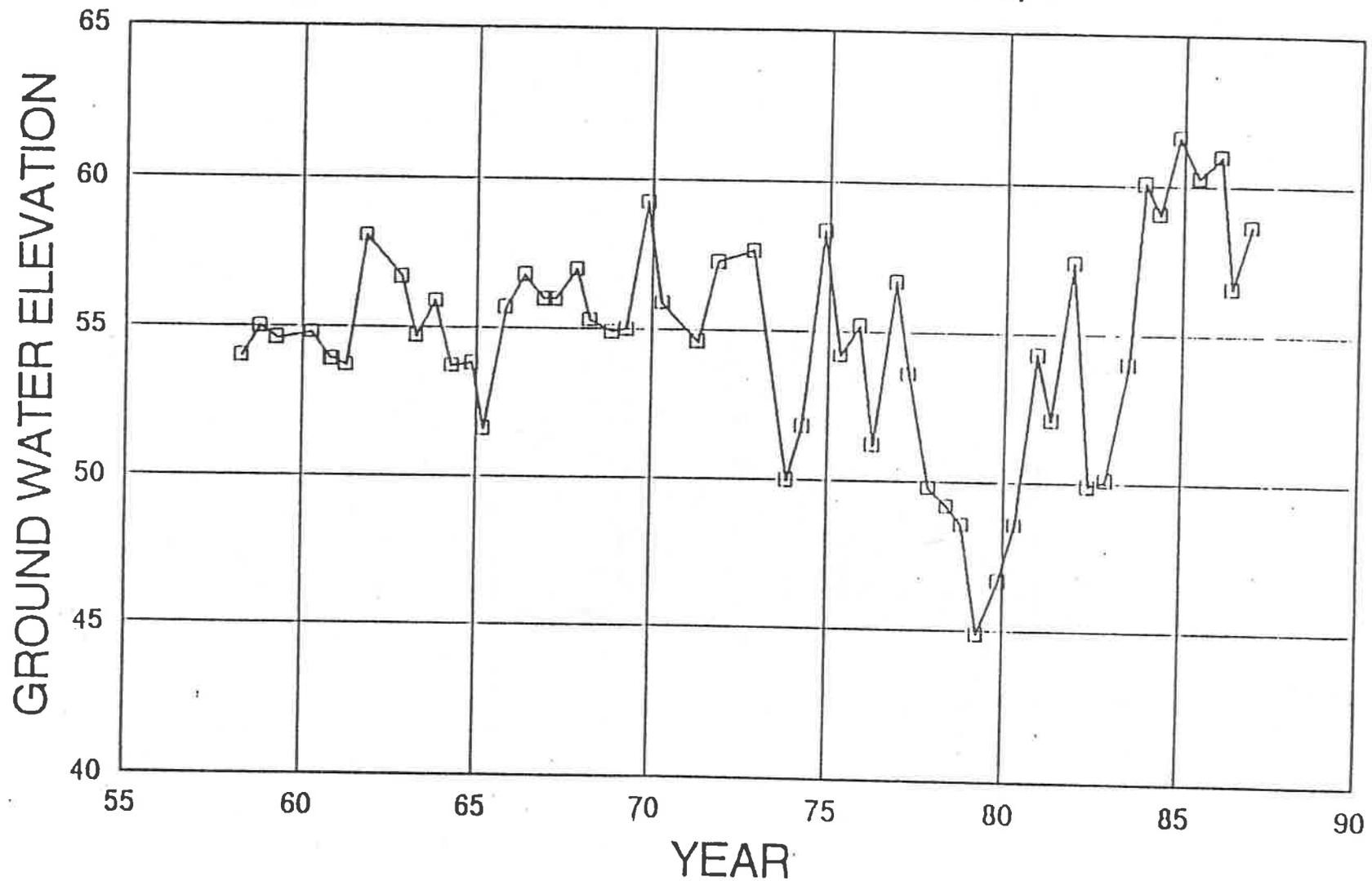




**WELL  
LOCATION  
MAP**

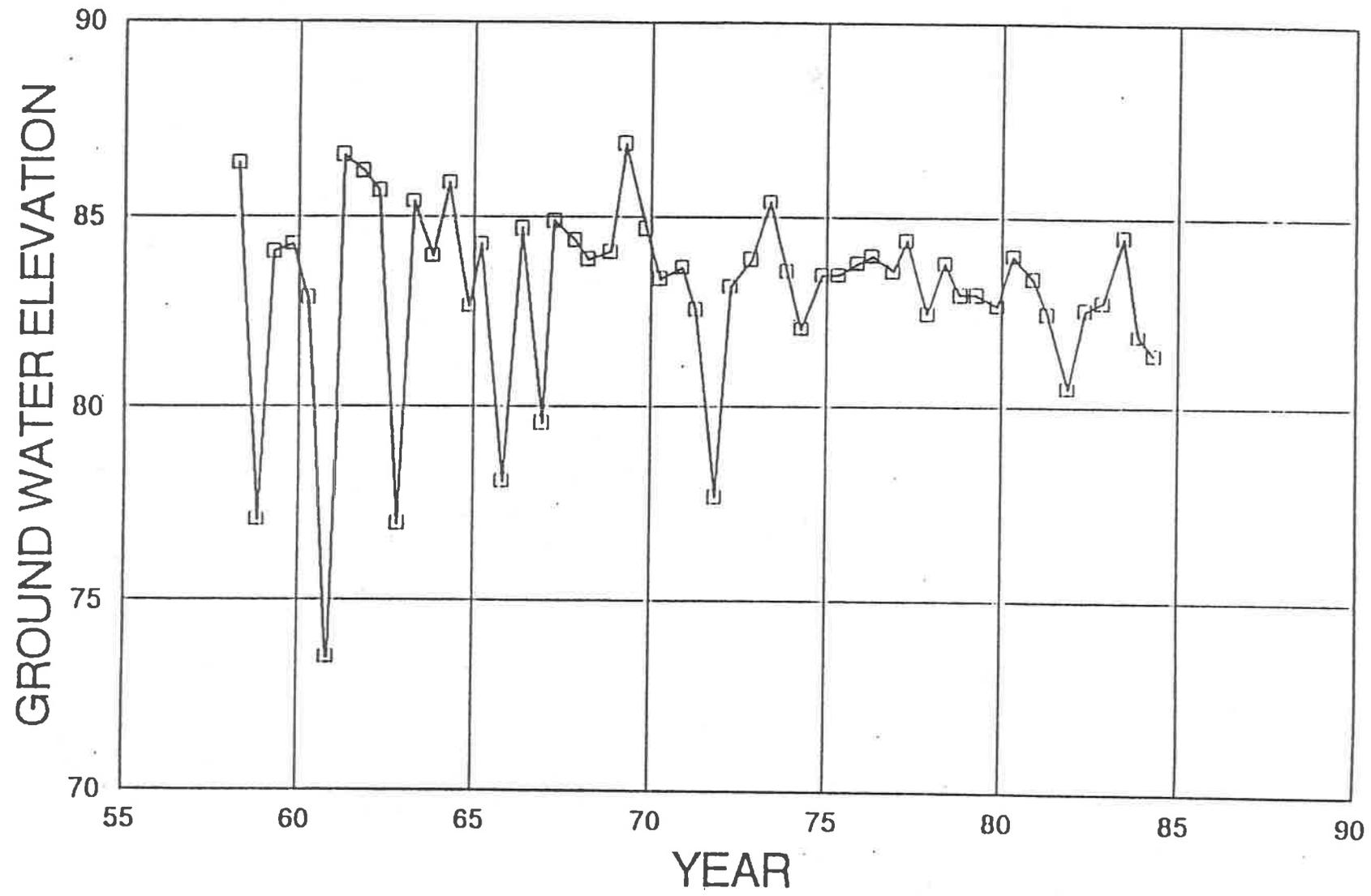
# WATER LEVEL ELEVATION

5S/7E-24H1 (One Mile NW of Patterson)



# WATER LEVEL ELEVATION

5S/32K1 (One Mile SE of Patterson)



# WATER LEVEL ELEVATION

5S/8E-31B2 & 5S/8E-31E1 (One Mile South of Patterson)

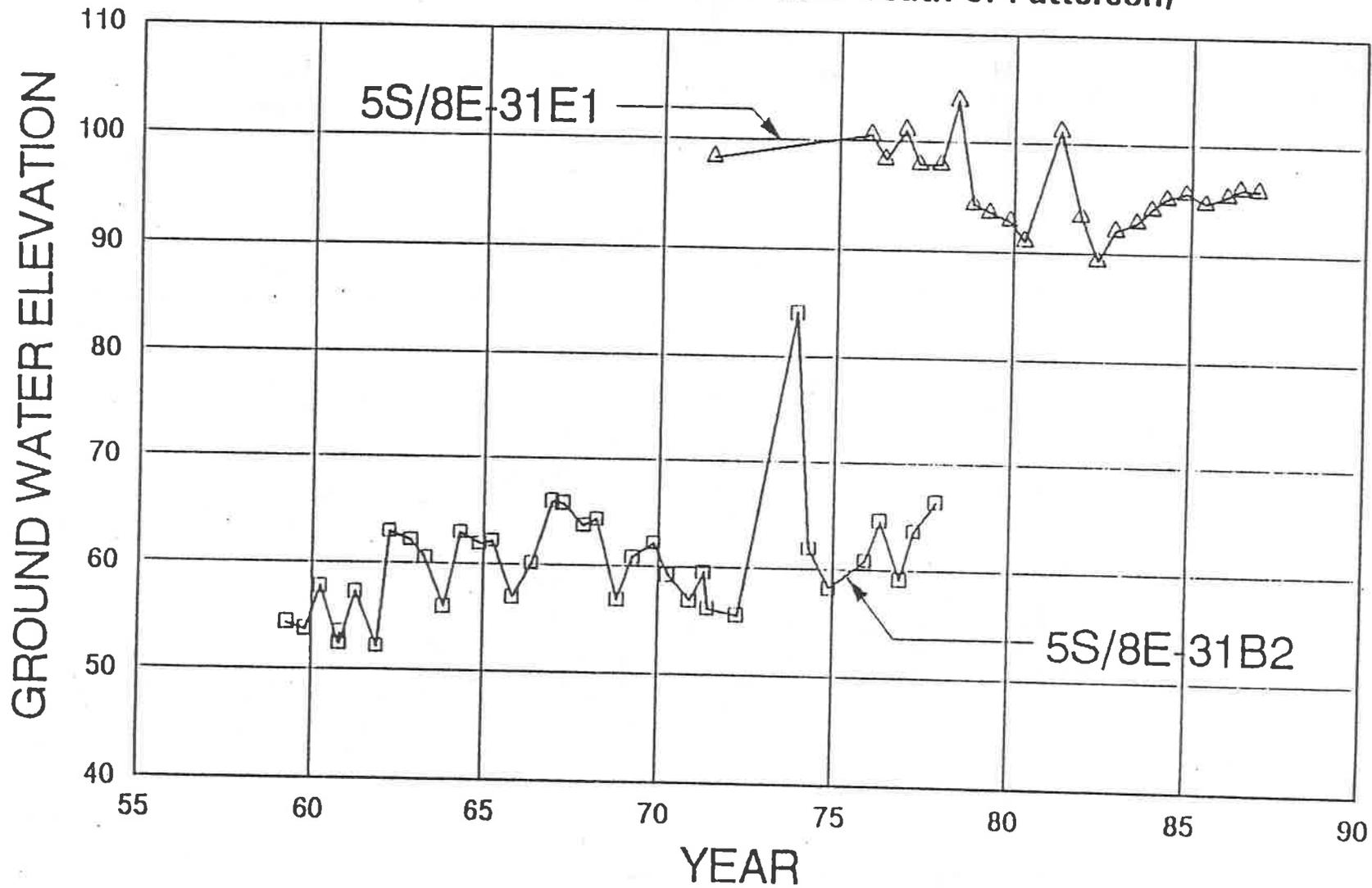


TABLE A7 (Continued)

SHAW PRELIMINARY DAU SURFACE WATER BUDGETS  
(1000 acre-feet)

		DAU 216												
Item		1970	1971	1972	1973	1974	1975	Year 1976	1977	1978	1979	1980	1981	1982
<b>Supply</b>														
Total Surface Diversions		1442.	1385.	1506.	1273.	1456.	1432.	1491.	967.	1041.	1374.	1341.	1407.	1297.
Total GW Pumpage		353.	366.	473.	362.	307.	419.	525.	785.	342.	258.	217.	590.	246.
Total Precip		477.	588.	243.	904.	575.	595.	328.	333.	961.	580.	685.	419.	848.
Minor Streams		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Total Supply		2272.	2340.	2222.	2540.	2338.	2446.	2344.	2085.	2345.	2213.	2243.	2495.	2392.
<b>Demand</b>														
<b>Consumptive Use</b>														
ET Dmnd from Appl Water (Crop)		879.	858.	987.	801.	862.	919.	1017.	911.	678.	796.	755.	1058.	754.
ET Dmnd from Precip (Crop)		263.	318.	137.	345.	323.	336.	187.	190.	389.	322.	377.	242.	466.
Hun & Ind		4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.
Wildlife		53.	53.	53.	53.	53.	53.	53.	53.	53.	53.	53.	53.	53.
Subtotal		1198.	1232.	1180.	1202.	1242.	1312.	1261.	1158.	1123.	1174.	1188.	1357.	1276.
<b>Recharge to Ground Water</b>														
Irrigation Percolation		301.	349.	488.	175.	284.	262.	375.	367.	280.	160.	206.	319.	246.
Excess Precip		3.	37.	0.	338.	2.	1.	0.	0.	345.	50.	66.	0.	77.
Minor Stream Seepage		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
M&I Losses to GW		7.	7.	7.	7.	7.	7.	7.	7.	7.	7.	7.	7.	7.
Wildlife Losses to GW		18.	18.	18.	18.	18.	18.	18.	18.	18.	18.	18.	18.	18.
DAU Conveyance Seepage		216.	208.	226.	191.	218.	215.	224.	145.	156.	206.	201.	223.	195.
Intentional Rech		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Subtotal		545.	618.	738.	729.	529.	503.	623.	537.	806.	441.	497.	587.	543.
<b>Nonrecoverable Losses</b>														
DAU Conveyance Evap		29.	28.	30.	25.	29.	29.	30.	19.	21.	27.	27.	30.	26.
ET Dmnd from Precip (Non-Crop)		212.	234.	107.	221.	250.	258.	141.	143.	228.	208.	242.	176.	305.
Exports and Spills		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Tailwater Export		289.	229.	167.	362.	288.	345.	289.	229.	167.	362.	288.	345.	242.
Head Ditch and Edge Losses		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Subtotal		529.	491.	304.	608.	568.	632.	460.	391.	416.	598.	557.	551.	573.
Total Demand		2272.	2340.	2222.	2540.	2338.	2446.	2344.	2085.	2345.	2213.	2243.	2495.	2392.

Source: "Fourth Progress Report - Ground Water Study, San Joaquin Valley", California Department of Water Resources, September 1989