
**APPENDIX A: VILLAGES OF PATTERSON NOTICE OF
PREPARATION / INITIAL STUDY
ENVIRONMENTAL CHECKLIST FORM**



City of Patterson

33 South Del Puerto Avenue

P.O. Box 667

Patterson, California 95363

(209) 892-2041

FAX (209) 892-6119

NOTICE OF PREPARATION

The purpose of this notice is to inform you that the City of Patterson Community Development Department, the Lead Agency, will prepare an environmental impact report (EIR) for the project identified below.

Project Title: Villages of Patterson Development Plan

Project Applicant: Terra Firma Entitlement Company, and Ramos Investments Commercial Development

Project Location: The project site is generally bounded by N. 1st Street (south of Salado Creek) and State Highway 33 to the west, Eucalyptus Avenue to the north, Sycamore Avenue to the east, and Walnut Avenue to the south. The project site also includes an approximately 40-acre area at the northeast corner of Olive Avenue and Sycamore Avenue, and an approximately 19-acre area at the southwest corner Walnut Avenue and Sycamore Avenue.

Project Description: The Villages of Patterson Development Plan would establish a detailed framework for development of the project site by identifying allowable land uses and their locations, and providing development standards and design guidelines. A mixed-use central core (The Village Circle) would be surrounded by four residential neighborhood quadrants ("Villages") offering a diverse range of housing types and integrated commercial/office uses, with sites reserved for parks, schools, and other public uses. A commercial/office/light industrial area is planned for the western edge of the Plan Area to buffer the Plan Area from the SPRR and State Highway 33. The Plan Area would be linked by a system of roads, parks, and bicycle/pedestrian trails. At buildout, the Villages of Patterson is expected to accommodate up to approximately 3,100 dwelling units, up to about 723,800 square feet of commercial/office/light industrial uses, and up to about 433,400 square feet of public and civic uses.

Lead Agency: City of Patterson
Community Development Department
33 S. Del Puerto Avenue
Patterson, California 95363

Rod Simpson, Community Development Director
(209) 892-2041

Initial Study: A description of the project and a discussion of its potential environmental effects are contained in the attached Initial Study.

The Community Development Department would like to know your views as to the scope and content that should be included in the EIR.

Posting Period March 8, 2006 through April 10, 2006: Due to time limits mandated by State law, your response should be sent at the earliest possible date, but no later than 30 days after receipt of this notice, or **April 10, 2006**. Comments should be directed to Rod Simpson, Community Development Director, at the Lead Agency's address noted above.

Public Scoping Meeting on March 22, 2006 at 3:00 P.M.: The City of Patterson Community Development Department will hold a public scoping meeting to receive oral and/or written comments on the scope of the EIR in the City Council Chambers, located at 48 N. Salado Avenue, Patterson, CA.

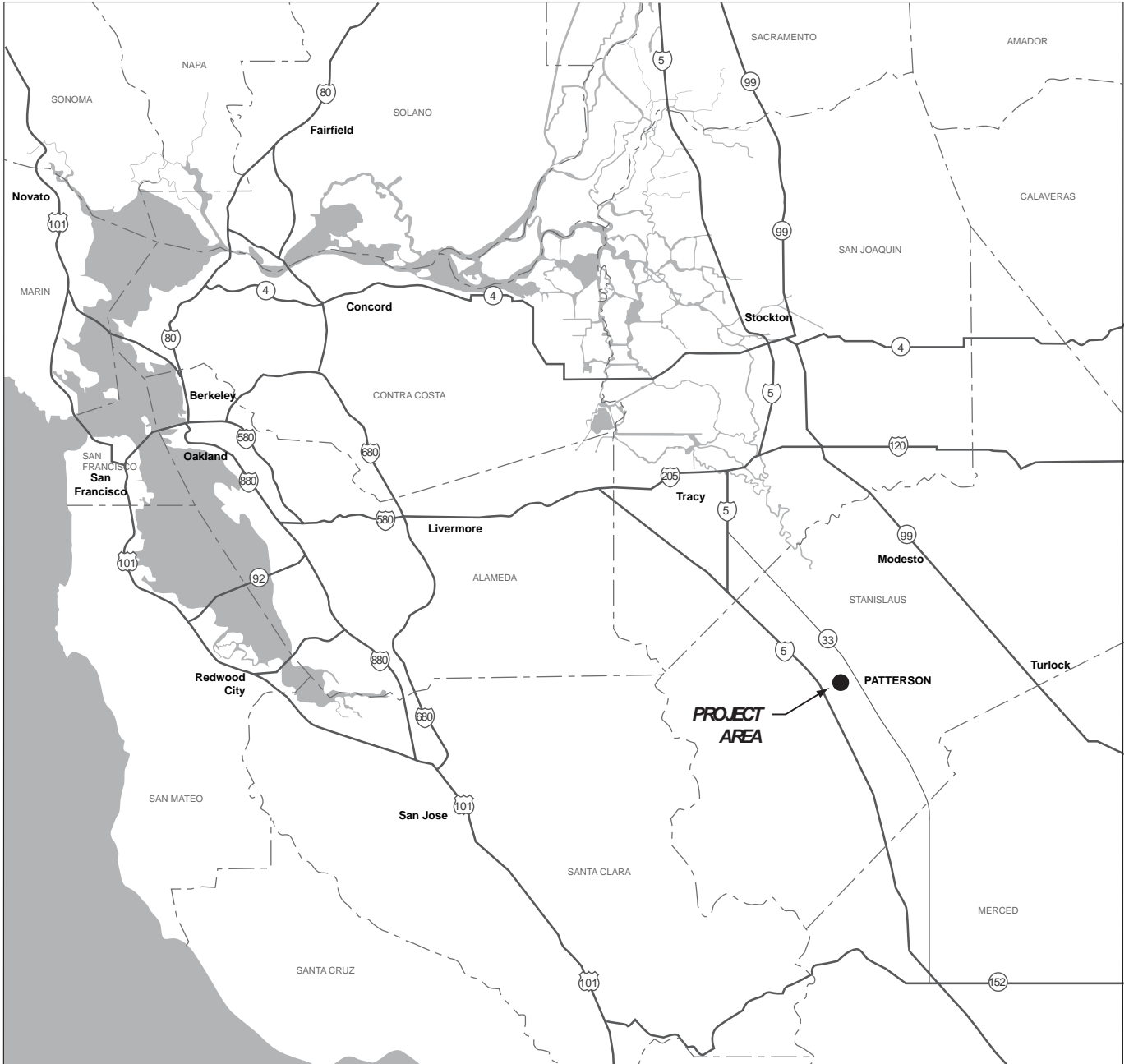
**CITY OF PATTERSON
INITIAL STUDY
ENVIRONMENTAL CHECKLIST FORM**

1. **PROJECT TITLE:** Villages of Patterson
Development Plan
2. **LEAD AGENCY NAME AND ADDRESS:** City of Patterson
33 S. Del Puerto Avenue
Patterson, CA 95363
3. **CONTACT PERSON AND PHONE NUMBER:** Rod Simpson
Community Development
Director
(209) 892-2041
4. **PROJECT LOCATION:**

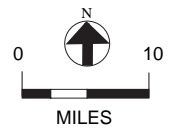
The City of Patterson is located along Interstate 5 in western Stanislaus County, about 89 miles southeast of San Francisco, 45 miles southwest of Livermore, 14 miles southwest of Modesto, and 92 miles south of Sacramento (**see Figure 1: Regional Location**). The approximately 692-acre Villages of Patterson Development Plan Area (the “Plan Area,” or “project site”) is north and east of the City of Patterson¹ in unincorporated Stanislaus County, contiguous to and outside of the incorporated boundaries of Patterson (**see Figure 2: City of Patterson and Project Site**). The Plan Area occupies the approximately one-square-mile area formed by State Highway 33 and the Southern Pacific Railroad (SPRR) right-of-way to the west, Eucalyptus Avenue to the north, Sycamore Avenue to the east, and Walnut Avenue to the south (the Plan Area does not include the existing light industrial properties located between the SPRR right-of-way and N. 1st Street, south of Salado Creek²). The Plan Area also includes an approximately 40-acre area at the northeast corner of Olive Avenue and Sycamore Avenue (the eastern half of which is currently owned and used by the City of Patterson as a stormwater detention basin to collect runoff from northeastern Patterson), and an approximately 19-acre area at the southwest corner Walnut Avenue and Sycamore Avenue. Patterson Irrigation District Laterals “D” and “C” run generally north-south through the project site. The Plan Area generally consists of agricultural uses (particularly orchards and row crops) with associated homes and farm structures.

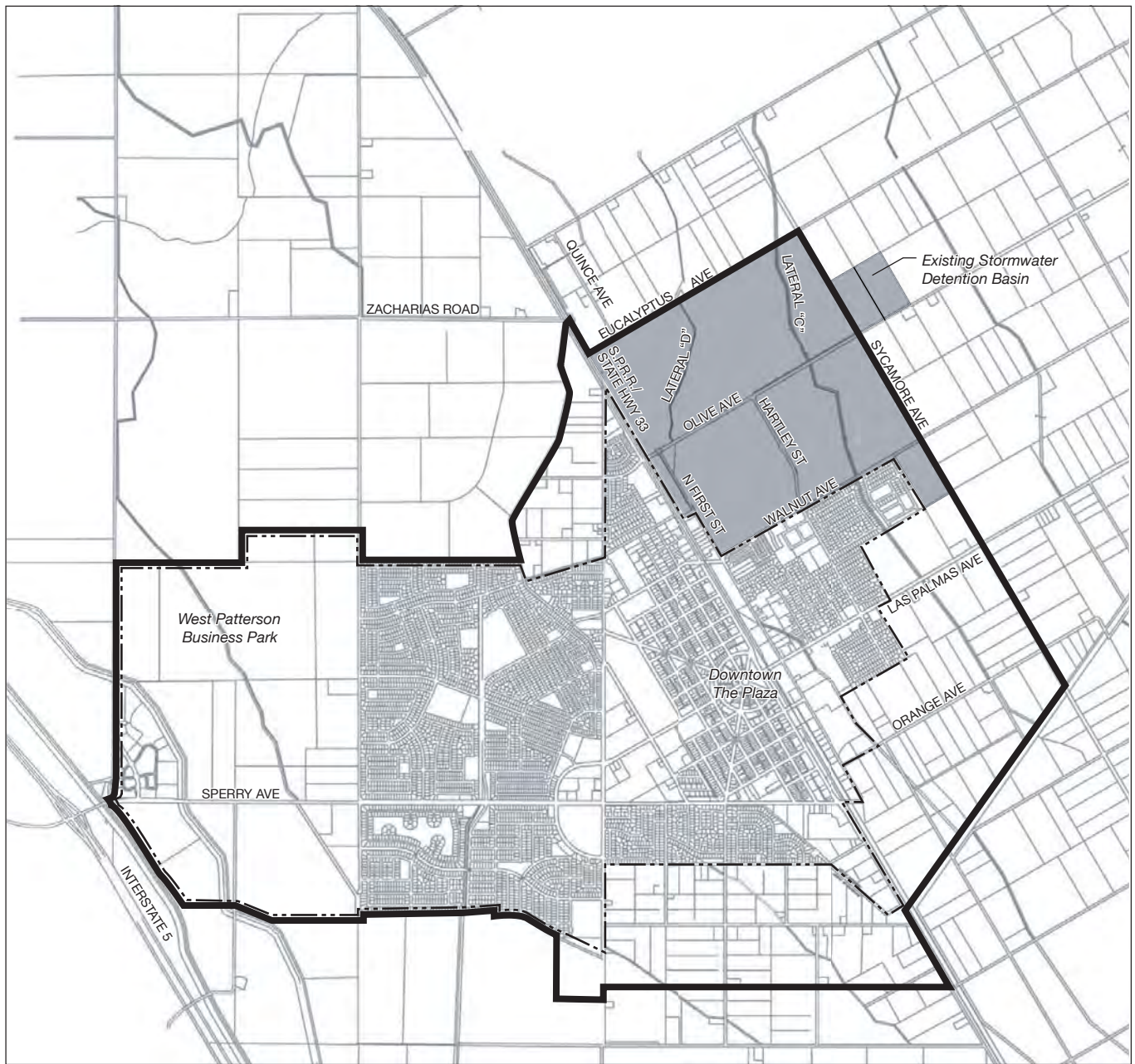
¹ For descriptive purposes in this Initial Study, Highway 33 and Sycamore Avenue are generally considered to run “north-south.” Eucalyptus Avenue, Olive Avenue, and Walnut Avenue are generally considered to run “east-west.”

² This area is within the City of Patterson and is designated Light Industrial under the City of Patterson’s General Plan.



SOURCE: Turnstone Consulting





SOURCE: City of Patterson and William Hezmalchal Architects, Inc.

- Villages of Patterson Plan Area
- Patterson General Plan Area
- Patterson City Limits

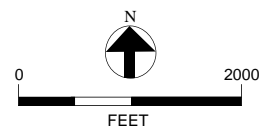


FIGURE 2: CITY OF PATTERSON AND PROJECT SITE

5. **PROJECT SPONSOR'S NAME AND ADDRESS:** Terra Firma Entitlement Company,
Ramos Investments Commercial Development
11 Plaza, Suite G
Patterson, CA 95363

6. **GENERAL PLAN DESIGNATION AND SPHERE OF INFLUENCE:**

Stanislaus County

The *Stanislaus County General Plan* land use designation for most of the Villages of Patterson project site is "General Agriculture." An approximately 106-acre area in the southern portion of the project site is designated "Urban Transition" under the County's General Plan.

City of Patterson

The Plan Area is within the City of Patterson's General Plan Area, except for the approximately 40-acre portion of the Plan Area at the northeast corner of Olive Avenue and Sycamore Avenue (the eastern half of which is currently used by the City as a stormwater detention basin) which is outside of the City's General Plan Area and has no City of Patterson General Plan designation.

The City's General Plan land use designation for most of the Plan Area is "Low Density Residential." An approximately 7-acre area west of N. 1st Street is designated "Heavy Industrial" under the City's General Plan. An approximately 27-acre area at the northwest corner of Walnut Avenue and Hartley Street is designated Public/Quasi-Public under the City's General Plan.

Sphere of Influence

The City of Patterson's adopted sphere of influence includes the portion of the Plan Area south of Olive Avenue.

7. **ZONING:**

The Stanislaus County zoning for most of the Villages of Patterson project site is A-2-20 (General Agriculture, 20 acre). The approximately 106-acre southern portion of the

project site (the same area designated “Urban Transition” under the County’s General Plan) is zoned A-2-10 (General Agriculture, 10 acres).

The project site currently has no City of Patterson zoning, since it is outside of the City’s incorporated boundaries. The proposed project includes an application to pre-zone the entire site to the City’s Planned Development (PD) zone.

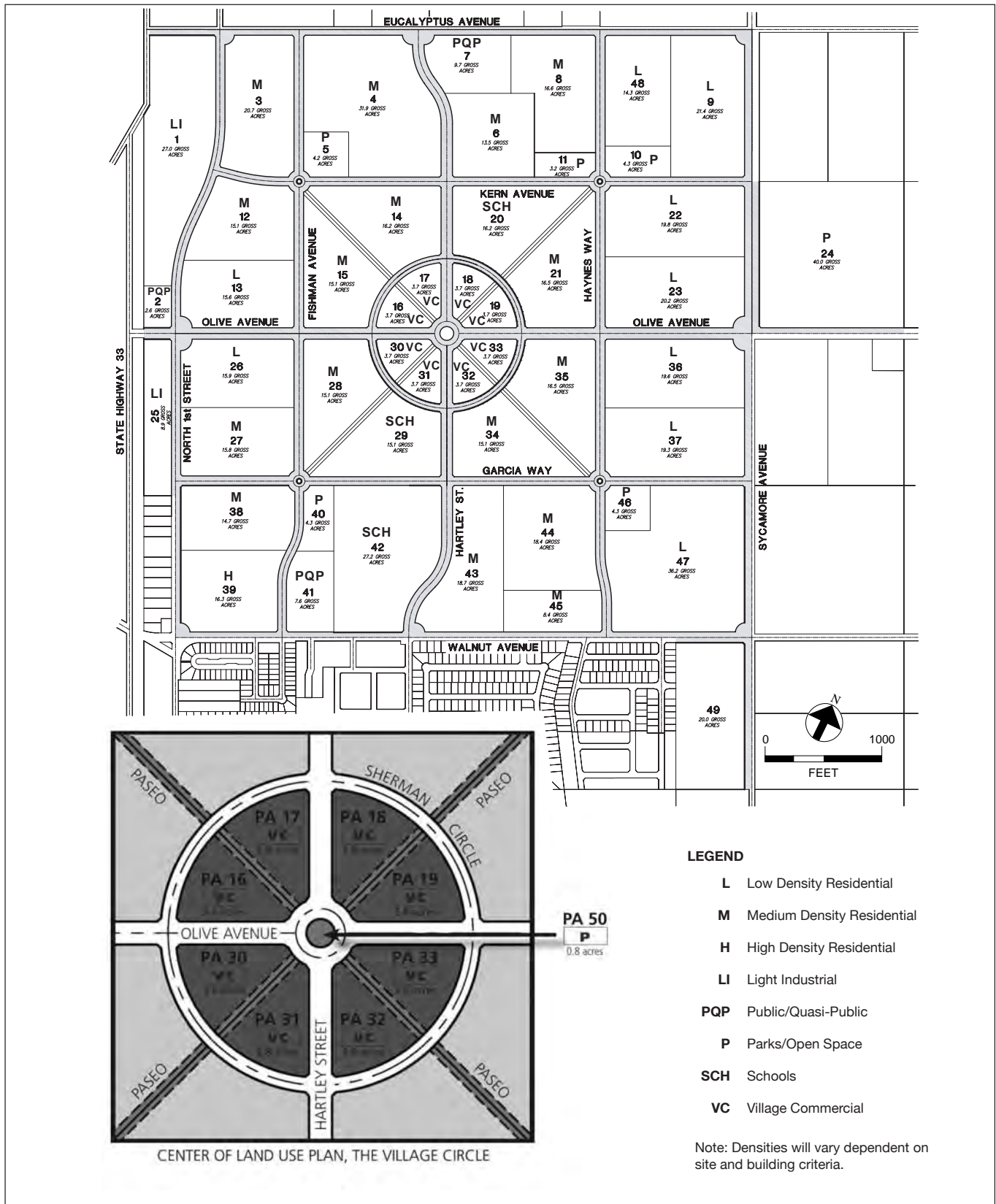
8. DESCRIPTION OF THE PROJECT:

The Villages of Patterson Development Plan envisions a traditionally-designed, pedestrian-oriented, master-planned community. The Development Plan would establish a detailed framework for development of the Plan Area by identifying allowable land uses and their locations, and providing development standards and design guidelines. It would govern review and approval of future specific development proposals as they are proposed under the Development Plan.

A mixed-use central core (The Village Circle) would be surrounded by four residential neighborhood quadrants (“Villages”) offering a diverse range of housing types and integrated commercial/office uses, with sites reserved for parks, schools, and other public uses. A commercial/office/light industrial area is planned for the western edge of the Plan Area to buffer the Plan Area from the SPRR and State Highway 33. The Plan Area would be linked by a system of roads, parks, and bicycle/pedestrian trails. At buildout, the Villages of Patterson is expected to accommodate up to approximately 3,100 dwelling units (d.u.), up to about 723,800 square feet (s.f.) of commercial/office/light industrial uses, and up to about 433,400 s.f. of Public/Quasi-Public uses.

Land Use Plan

The Master Land Use Plan identifies proposed land use categories and their location (see **Figure 3: Master Land Use Plan**), and proposed development densities for each land use category (see **Table 1: Land Use Summary**). Development standards for each land use category are provided, consistent with the City’s General Plan land use designations. These include standards governing allowable density, permitted and conditional uses, lot dimensions, setbacks, building dimensions, and parking requirements. Design guidelines for each land use category are also provided to guide the design and review of development projects, establish an overall visual identity and character for the community, promote high quality design, and encourage a pedestrian scale and orientation for buildings within the Plan Area.



SOURCE: William Hezmalhach Architects, Inc.

FIGURE 3: PROPOSED MASTER LAND USE PLAN

Table 1: Land Use Summary ^a

LAND USE DESIGNATION	Acreage (ac)	Residential Capacity (du)	Non-Residential Capacity (gsf)
Residential			
Low Density Residential (1.1-5 DU/Acre)	202.3 ac	852 du	NA
Medium Density Residential (5.1-12 DU/Acre)	268.3 ac	1,709 du	NA
High Density Residential (12.1-20 DU/Acre)	16.3 ac	232 du	NA
Subtotal	486.9 ac	2,793 du	NA
Village Circle			
Subtotal	25.9 ac	307 du	100,000 gsf
Light Industrial			
LI Area 1	27.0 ac	NA	468,700 gsf
LI Area 25	8.9 ac	NA	155,100 gsf
Subtotal	35.9 ac	NA	623,800 gsf
Public/Quasi-Public			
PQP Area 2	2.6 ac	NA	56,600 gsf
PQP Area 7	9.7 ac	NA	211,300 gsf
PQP Area 41	7.6 ac	NA	165,500 gsf
Subtotal	19.9 ac	NA	433,400 gsf
School			
SCH Area 20	16.2 ac	NA	NA
SCH Area 29	15.1 ac	NA	NA
SCH Area 42	27.3 ac	NA	NA
Subtotal	58.6 ac	NA	NA
Parks			
P Area 5	4.2 ac	NA	NA
P Area 10	4.3 ac	NA	NA
P Area 11	3.2 ac	NA	NA
P Area 24	40.0 ac	NA	NA
P Area 40	4.3 ac	NA	NA
P Area 46	4.3 ac	NA	NA
P Area 50	0.8 ac	NA	NA
Village Circle Area 19 ^b	3.7 ac	NA	NA
Subtotal	64.8	NA	NA
PLAN AREA TOTAL	692.0 ac	3,100 du	1,157,200 gsf

Source: The Villages of Patterson Development Plan

Notes:

- This table represents a preliminary distribution of maximum densities. The distribution of densities between planning areas may shift.
- The Village Circle park could be in any of the eight Planning Areas that comprise the Village Circle.

Downtown Commercial

The Downtown Commercial (DC) land use designation, as defined in the Patterson General Plan, would be applied to a total of about 30 acres, comprised of eight wedge-shaped areas of the Village Circle. The DC designation would allow for a mix of multi-unit residential (about 307 dwelling units, including live-work activities), commercial (up to about 100,000 s.f. total including office, retail, and home-based business), and civic uses. Banks would be excluded from the Village Circle.

Residential

The Plan Area would include the following three categories of residential land use designations, as defined in the Patterson General Plan.

Low Density Residential

The Low Density Residential designation (LR, at 1.1 to 5.0 d.u. per acre) would be applied to a total of about 202 acres. It is expected to accommodate a total of about 852 dwelling units. It would be the predominant land use designation for the eastern portion of the Plan Area (east of Haynes Way, with other Low Density Residential areas occurring elsewhere).

Medium Density Residential

The Medium Density Residential designation (MR, at 5.1 to 12.0 d.u. per acre) would be applied to a total of about 268 acres. It is expected to accommodate a total of about 1,709 dwelling units. It would be the predominant land use designation for the central portion of the Plan Area (west of Haynes Way and east of N. 1st Street) outside of the Village Circle.

High Density Residential

The High Density Residential designation (HR, at 12.1 to 20.0 d.u. per acre) would be applied to an area of about 16 acres, located at the southwest corner of the Plan Area (other locations within the Plan Area are also being considered). It is expected to accommodate about 232 dwelling units.

Light Industrial

The Light Industrial (LI) land use designation, as defined in the Patterson General Plan, would be applied to two areas, totaling about 36 acres, at the westernmost portion of the Plan Area, adjacent to the SPRR right-of-way. The LI designation would allow for commercial, office, warehouses and light manufacturing, at an allowable Floor Area Ratio (FAR) of 0.4. Given the site constraints of these narrow areas, it is anticipated that they would serve smaller light industrial users than those served by the West Patterson Business Park. The Light Industrial designation under the proposed Development Plan is expected to accommodate about 623,800 s.f. of Light Industrial development.

Public/Quasi Public

The Public/Quasi Public (PQP) designation, as defined in the Patterson General Plan, would be applied to three areas at the northern, southern, and western edges of the Plan Area, totaling about 20 acres. The PQP designation would allow for public uses, such as fire and police stations, community centers, libraries and houses of worship, at an allowable FAR of 0.5. The Public/Quasi Public designation would accommodate about 433,400 s.f. of Public/Quasi Public development. Proposed school sites would also be designated PQP under the Patterson General Plan, but are treated separately for descriptive purposes in the Development Plan (see below).

Schools

Three school sites are identified for the Plan Area totaling about 59 acres (at Hartley Street and Kern Avenue and at Hartley Street and Garcia Way). Schools would be consistent with the PQP land use designation as defined in the Patterson General Plan. The Patterson Unified School District would construct the first of these schools at Hartley Street and Garcia Way.

Parks

The Development Plan would provide for a total of about 65 acres of parkland consisting of the following: five areas, totaling about 20 acres, identified for neighborhood parks at the center of each of the four Villages (the northeast Village has two parks planned at its center); a 40-acre soccer field facility located within the proposed expanded detention basin site west of Sycamore Avenue and north of Olive Avenue; and two areas, totaling about 5 acres, within the Village Circle consisting of the circular hub of the central roundabout, and one of the wedge-shaped areas surrounding the hub (to be determined).

Circulation Plan

The Development Plan's Circulation Plan calls for an integrated roadway and pedestrian/bicycle trail system by extending existing streets into the Plan Area (**see Figure 4: Circulation Plan**). It establishes the general layout and detailed design standards for roadways and intersections in the Plan Area to implement Patterson's General Plan Circulation Element.

The proposed circulation system would be formal and hierarchical, aligned with the grid framework of existing major collector roadways at the perimeter of the Plan Area (Eucalyptus Avenue, Sycamore Avenue, Walnut Avenue), and the existing east/west major collector through the center of the Plan Area (Olive Avenue). A new north/south major collector (Hartley Street) would be constructed through the center of the Plan Area which, with Olive Avenue, would define the four Village quadrants. A central traffic roundabout at the intersection of Olive Avenue and Hartley Street would calm traffic and mark the centerpoint of the Villages of Patterson. N. 1st Street would be extended northward, also as a major collector, to align with existing Quince Avenue.

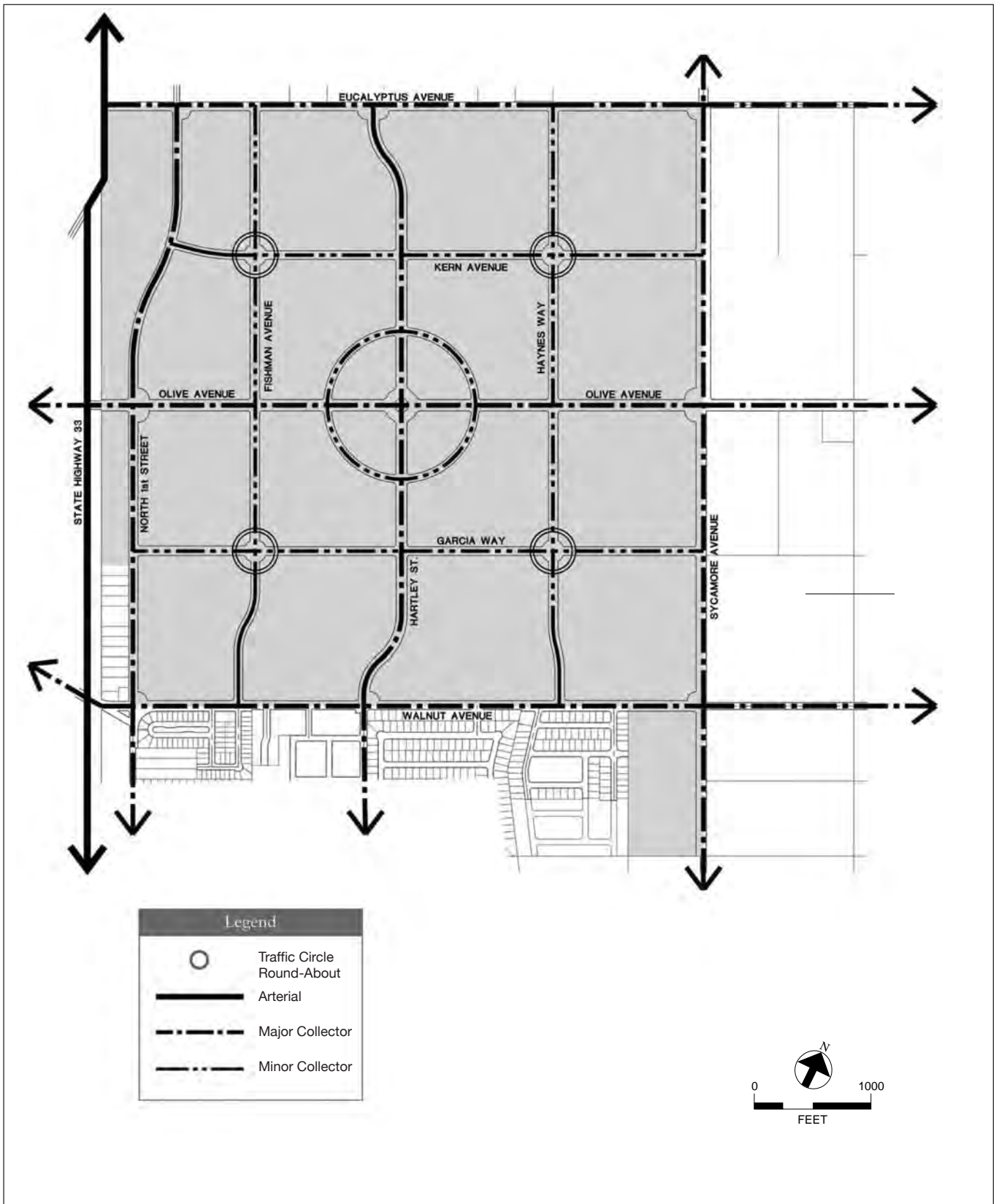
A new circular minor collector street (Sherman Circle) would encircle and define the Village Center. Its concentric ring configuration would echo that of Patterson's historic downtown. New north/south minor collectors (Fishman Avenue and Haynes Way), and east/west minor collectors (Kern Avenue and Garcia Way) would bisect each Village quadrant. Traffic roundabouts at the intersection of a north/south minor collector with an east/west minor collector would calm traffic and mark the center of each Village quadrant.

A network of interior residential streets and alleyways would provide access to residential properties at the interiors of areas between major and minor collector streets. The specific alignment of interior residential streets and alleyways would be determined during the design phase of individual projects and reviewed and approved under the subdivision approval process.

Public Facilities and Services

Water

The City of Patterson would provide water supply services for the Plan Area through connection to, and expansion of, the City's water supply system. The water supply distribution system for the Plan Area would be connected to the City water distribution



SOURCE: William Hezmalhalch Architects, Inc.

FIGURE 4: PROPOSED CIRCULATION PLAN

system and include 12-, 14- and 16-inch water transmission lines in addition to local 8- and 10-inch distribution lines to serve the individual parcels within the Plan Area (see **Figure 5: Master Water Plan**).

Wastewater

The City of Patterson would provide wastewater services for the Plan Area through connection to, and expansion of, the City's wastewater service system. Sewage flows from the southern portion of the Plan Area would be collected in a 16-inch main in Sycamore Avenue and conveyed southward to the existing sewer trunk line in Walnut Avenue that leads directly to the City's Wastewater Treatment Plant (see **Figure 6: Master Wastewater Plan**). Sewage flows for the northern portion of the Plan Area would be collected in a 12-inch main in Sycamore Avenue and conveyed southward to a lift station at the intersection of Sycamore and Olive Avenues, and transferred to the 16-inch main in Sycamore Avenue south of Olive Avenue.

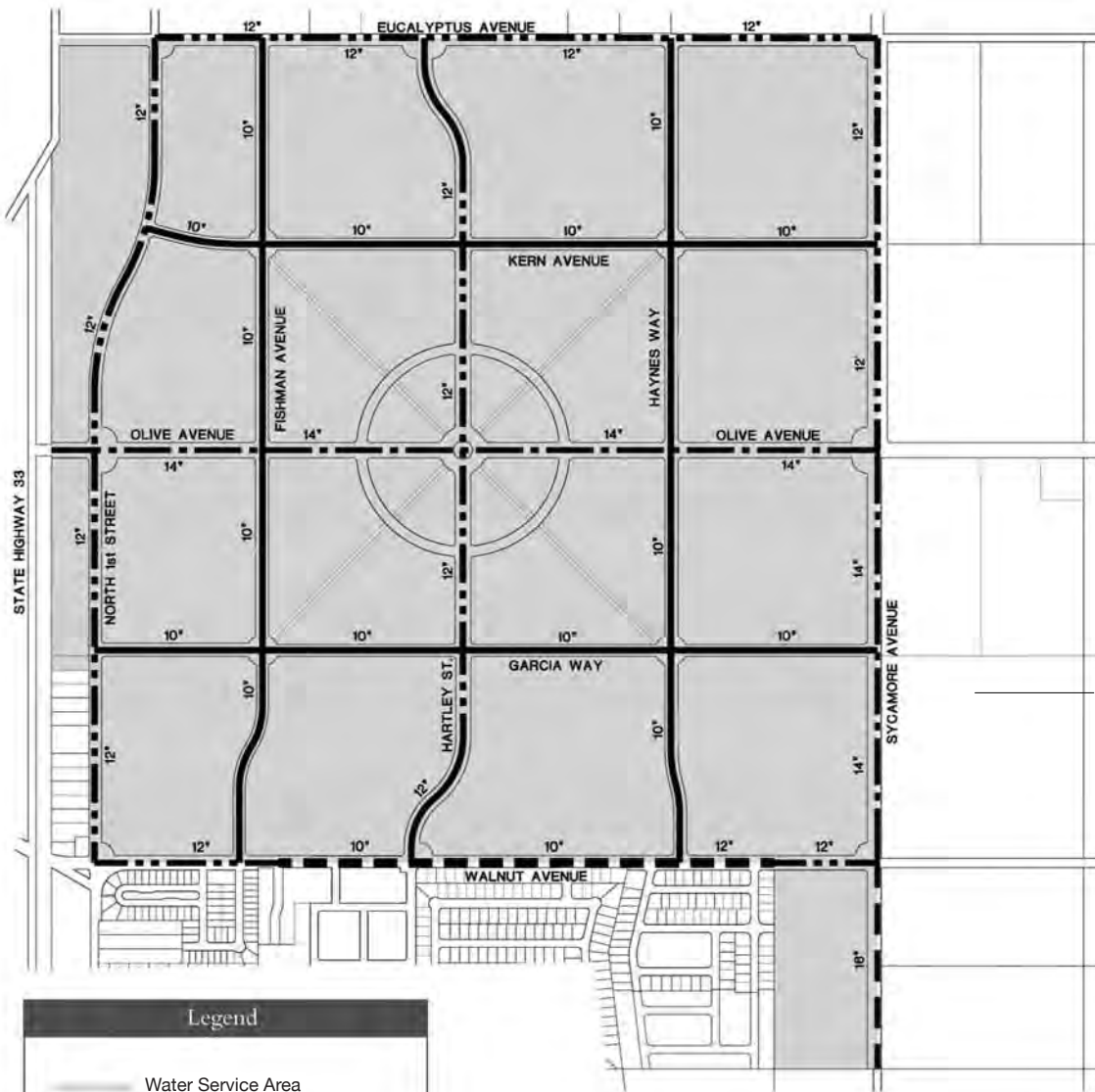
Stormwater

The City of Patterson would provide stormwater services including collection, transmission and disposal of stormwater for the Plan Area through connection to, and expansion of, the City's stormwater system. Stormwater runoff from Salado Creek and the City of Patterson is currently transmitted to the San Joaquin River through the Salado Creek drainage system which runs through the Plan Area in a 96-inch pipe in Olive Avenue. The City currently operates the existing stormwater detention basin along the north side of Olive Avenue, east of Sycamore. The existing stormwater detention basin would be deepened and expanded eastward to collect stormwater from the Plan Area. Collected stormwater would be pumped into the existing Olive Avenue pipeline for transmission to the San Joaquin River (see **Figure 7: Master Stormwater Plan**).

Police and Fire Protection

As part of the proposed project, construction of a fire station/police satellite station is planned for the area designated "PQP" at the northwest corner of Olive Avenue and N. 1st Street, to provide for desired response times for the east side of Patterson, under the City's General Plan.³

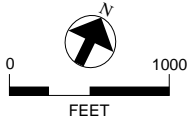
³ General Plan Policy IV.E.1 establishes a three-minute goal for average response time to police emergency calls. General Plan Policy IV.F.1 establishes a five-minute goal for average response time to fire emergency calls.



Legend

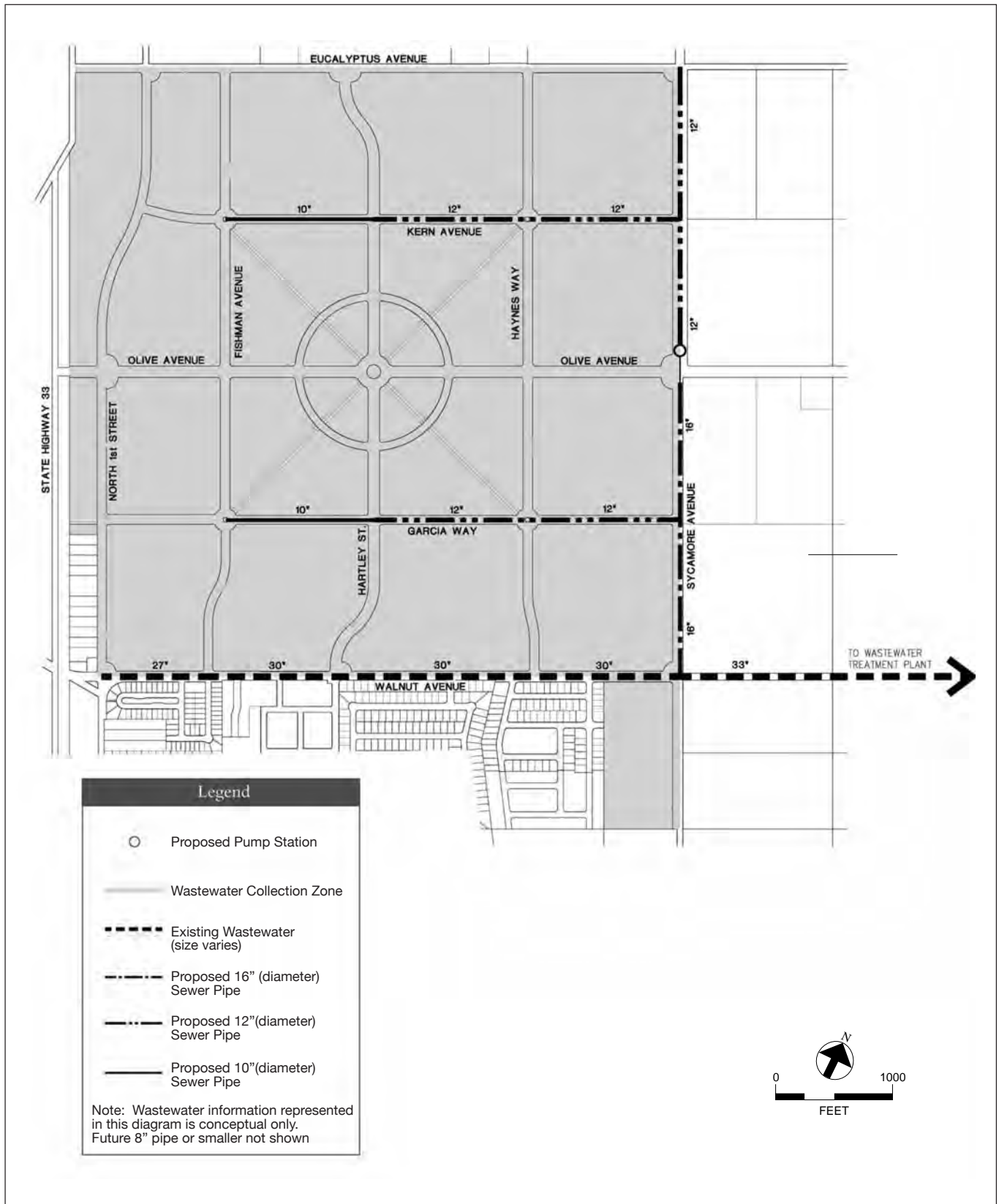
- Water Service Area
- Existing Water Main (size varies)
- Proposed 16" (diameter) Water Main
- Proposed 14"(diameter) Water Main
- Proposed 12"(diameter) Water Main
- Proposed 10"(diameter) Water Main

Note: Water information represented in this diagram is conceptual only. Future 8" pipe or smaller not shown



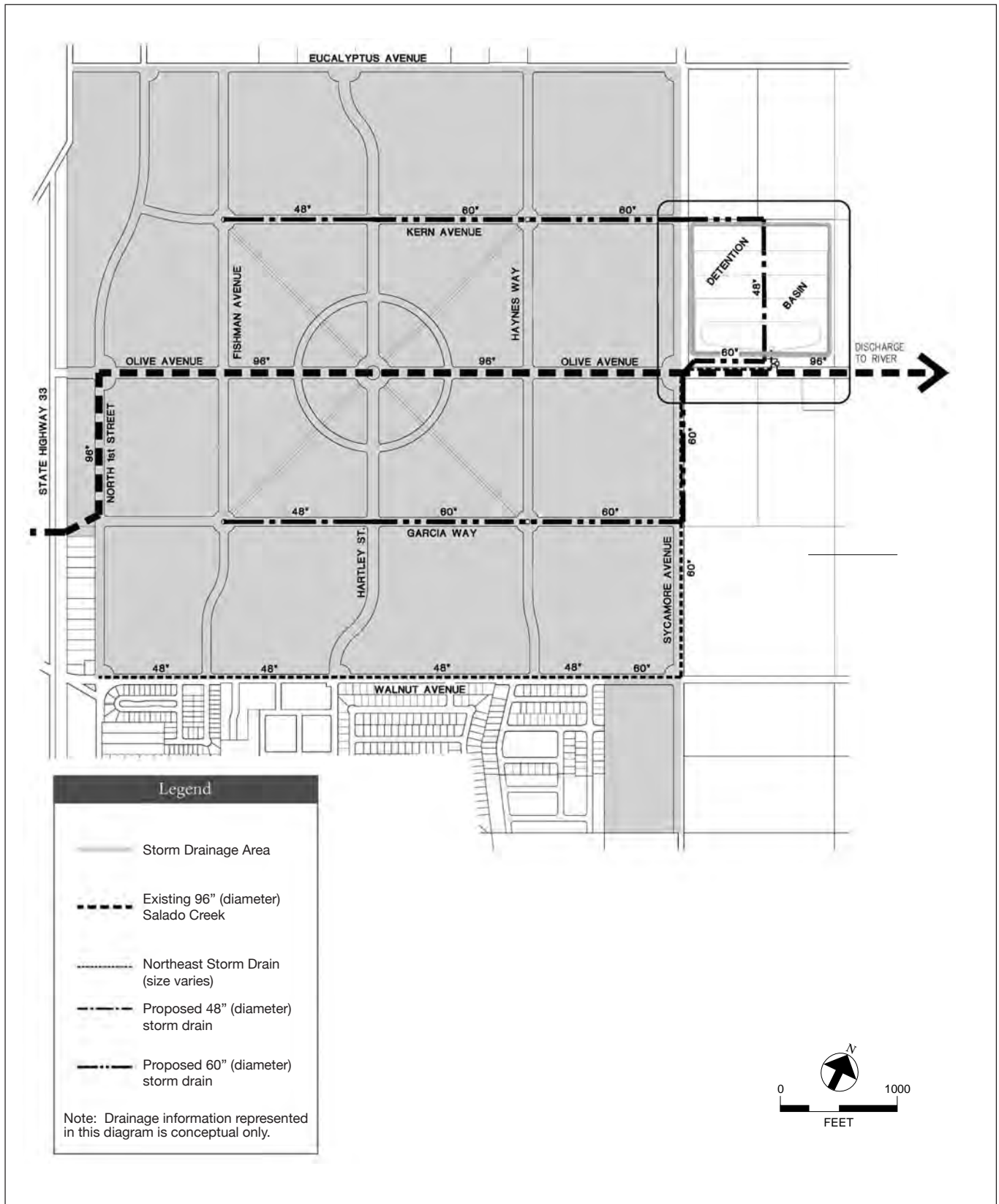
SOURCE: William Hezmalhalch Architects, Inc.

FIGURE 5: PROPOSED WATER PLAN



SOURCE: William Hezmalhalch Architects, Inc.

FIGURE 6: PROPOSED WASTEWATER PLAN



SOURCE: William Hezmalhaich Architects, Inc.

9. SURROUNDING LAND USES AND SETTING:

The project site is bounded by the City of Patterson and urban uses along its entire southern boundary along Walnut Avenue, including recent low-density residential development and a high-density, multi-unit residential development located off of Walnut Avenue at Eureka Street (operated by the Stanislaus County Housing Authority).

To its west, the project site is also bounded by City of Patterson urban uses along approximately two-thirds of its western boundary, including several existing light industrial uses (including self storage, printing and automotive) on the west side of N. 1st Street. North of Salado Creek, the SPRR right-of-way and State Highway 33 bound the Plan Area to the west. Across Highway 33 to the west of the project site is high-density residential development (El Solyo Village). North of Ivy Street is low-density residential development. At the northernmost tip of the City of Patterson along Highway 33 is a wholesale farm equipment dealer.

To the north and east of the project site are ongoing agricultural uses in unincorporated Stanislaus County similar to those currently within the Plan Area.

10. APPROVALS

The following approvals are required for the Villages of Patterson Development Plan:

City of Patterson Approvals

- Certification of an EIR;
- Amendments to the City's General Plan Land Use map: from Low Density Residential to Downtown Core within The Village Circle; and from Heavy Industrial to Light Industrial at the western portion of the project site north of Olive Avenue;
- Rezoning of the Plan Area to zoning districts that coincide with the Development Plan;
- Amendments to the City's Infrastructure Master Plans for water, sewer, stormwater and circulation to include the proposed project;
- Approval of a Water Supply Assessment;
- Villages of Patterson Preliminary and Final Development Plan;

- Vesting Tentative Subdivision “A” Map(s) (for larger lots for later subdivision into neighborhoods);
- Vesting Tentative Subdivision “B” Map(s) (for neighborhoods);
- Development agreement(s) between the City and applicants;
- Initiate Application to LAFCO (for approvals described below);
- Creation of, or annexation to, a Mello-Roos District;
- Approval of Williamson Act contract cancellations;
- Creation of, or annexation to, a fire assessment district;
- Building permits and use permits.

LAFCo Approvals

- Adoption of amendments to the Service Review and Master Service Element for the City’s Sphere of Influence to include the service plans for the proposed project;
- Amendment to the City’s Sphere of Influence to include the portion of the Plan Area north of Olive Avenue;
- Reorganization to annex the entire Plan Area to the City, remove the Plan Area from fire and irrigation districts and add it to City service areas.

11. OTHER PUBLIC AGENCIES WHOSE APPROVALS ARE REQUIRED:

- Stanislaus County permit for well construction under Stanislaus County Code Chapter 9.36;
- Regional Water Quality Control Board (RWQCB) General Construction Permit;
- Approval by Patterson Irrigation District to remove irrigation Laterals 5 and 6.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

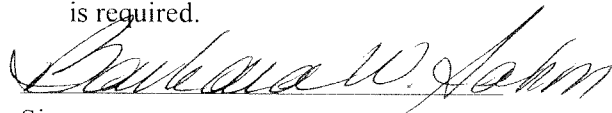
The environmental factors, indicated below by a solid box (■), would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

- | | | |
|---------------------------------|--------------------------------------|----------------------------|
| ■ Aesthetics | ■ Agriculture Resources | ■ Air Quality |
| ■ Biological Resources | ■ Cultural Resources | □ Geology / Soils |
| ■ Hazards & Hazardous Materials | ■ Hydrology / Water Quality | ■ Land Use / Planning |
| □ Mineral Resources | ■ Noise | □ Population / Housing |
| □ Public Services | □ Recreation | ■ Transportation / Traffic |
| ■ Utilities / Service Systems | ■ Mandatory Findings of Significance | |

DETERMINATION

On the basis of this initial evaluation:

- I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
- I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
- I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.



Signature



Date

Barbara Sahn
For Rod Simpson

EVALUATION OF ENVIRONMENTAL IMPACTS

I. AESTHETICS	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project:				
a) Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Discussion

- a, b) No scenic vistas are identified on or near the project site. Interstate 5, about three miles to the east of the project site, is designated as a California State Scenic Highway for its entire length through Stanislaus County. The Plan Area would be minimally visible in the distance (if distinguishable at all) from Interstate 5. The proposed project would have no impact on scenic vistas and scenic resources. These topics will not be discussed in the EIR.
- c, d) The proposed project would transform the existing open agricultural visual character of the project site to developed residential, commercial and civic uses. The topics of visual/aesthetic quality and potential light and glare will be discussed in an Environmental Impact Report (EIR).

II. AGRICULTURE RESOURCES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
<p>In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project:</p>				
<p>a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?</p>	■	□	□	□
<p>b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?</p>	■	□	□	□
<p>c) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?</p>	■	□	□	□

Discussion

The entire project area is considered Prime Farmland by the United States Department of Agriculture, and includes a number of properties that are subject to Williamson Act contracts. This topic of impacts on agricultural resources will be discussed in an EIR.

III. AIR QUALITY	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	■	□	□	□
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	■	□	□	□
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	■	□	□	□
d) Expose sensitive receptors to substantial pollutant concentrations?	■	□	□	□
e) Create objectionable odors affecting a substantial number of people?	□	□	■	□

Discussion

- a-d) Operation of the proposed project would result in air pollutant emissions from project-related motor vehicle trips, and land-use-based sources such as natural gas. The topic of potential effects on air quality and the potential for exposure of sensitive receptors to pollutants will be discussed in an EIR.
- e) The project includes construction of a residential and commercial development in the Plan Area, where it would not operate under conditions or with any large volumes of chemicals or activities that could create objectionable odors in the site vicinity. Therefore, the topic of odors will not be discussed in the EIR.

IV. BIOLOGICAL RESOURCES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	■	□	□	□
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	■	□	□	□
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	■	□	□	□
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	■	□	□	□
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	■	□	□	□
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	□	□	□	■

Discussion

- a, b) A biotic report will be prepared as a background study for the EIR analysis. The report will identify whether any candidate, sensitive, and special status species and areas of sensitive natural communities are present on the project site and the EIR will analyze how project development may impact habitat for these species.
- c) Salado Creek runs through the project site in a 96-inch pipe to the San Joaquin River. Irrigation Laterals “C” and “D” also run through the project site. The biotic report will determine whether there are any federally protected natural or artificial water bodies on the project site. This topic will be discussed in the EIR.
- d) The agricultural habitats of the project site may provide habitat for migrating birds. Development of the project site may result in significant impacts to wildlife migration patterns. Therefore, this topic will be discussed in the EIR.
- e) Both Stanislaus County and the City of Patterson have General Plan policies protecting biological resources. This topic will be discussed in the EIR.

Neither the County nor the City have tree preservation ordinances applicable to the project site. This topic will not be discussed in the EIR.

- f) The project site is not included in any known local, regional, or state conservation or habitat conservation plan. Therefore, this topic will not be discussed further in the EIR.

V. CULTURAL RESOURCES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

CULTURAL RESOURCES <i>(Continued)</i>	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Disturb any human remains, including those interred outside of formal cemeteries?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Discussion

The Central California Information Center (CCIC) conducted a record search for the Plan Area.⁴ The search included a review of maps for the specific project area and vicinity, and review of the National Register of Historic Places, the California Register of Historical Resources, the *California Inventory of Historic Resources* (1976), the *California Historical Landmarks* (1990), the *California Points of Historical Interest* listing (May 1992 and updates), the Historic Property Data File (Office of Historic Preservation current computer list, December 2004), the Caltrans State and Local Bridge Survey (1989 and updates), the *Survey of Surveys* (1989), GLO Plats, and other pertinent historic data available at the CCIC for each specific county.

a. Historic Architectural Resources⁵

Background

The Plan Area is part of the Patterson Colony, recorded with the County in 1909. The Patterson Colony included downtown Patterson and extended eastward from the SPRR tracks to the San Joaquin River, and extended over 3 miles north and over 3 miles south of Las Palmas Avenue. The city’s founder, Thomas Patterson, laid out Patterson’s downtown, subdivided the land into 5-, 10-, and 20- acre tracts, and developed an innovative irrigation system to deliver water from the San Joaquin River to farms. By fall of 1911, 50 residences had been built in the Patterson Colony.

Patterson planned the downtown in a unique pattern modeled after Washington D.C. A circular “hub,” El Circulo Avenue, rings the downtown center. Radiating streets emanate from a circular central plaza. The older downtown residential blocks surrounding the downtown center are laid out in a regular axial street grid. Secondary traffic circles are located where the circular, radial and grid streets converge. Although only the palms along Las Palmas Avenue survive from Thomas Patterson’s original plantings, the downtown features a mature cover of trees lining the streets of the downtown residential

⁴ Central California Information Center (CCIC), California Historical Resources Information System. CCIC File # 6033N, December 2005.

⁵ For the purposes of this Initial Study, the term “historic architectural resources” is synonymous with “historical resources” under CEQA Guidelines Section 15064.5. The former term is used here to exclude archeological resources, which may also be considered historical resources under CEQA, but are covered separately below.

district, providing shade and a unifying formal element for the downtown, framing views down streets.

The following resources in the Patterson area are included, or identified, in local, state and/or federal registers of historic resources, or are recognized for their historic character in the City's General Plan. As such, they are considered "Historical Resources" for the purposes of CEQA Section 15064.5(a).

- The Historic Overlay Zone is a local historic district located at the core of the City of Patterson (at the convergence of Las Palmas, Del Puerto, and Salado Avenues, and Third Street), designated under Patterson's Zoning Ordinance. It includes Patterson's central circular Plaza, the wedge-shaped buildings surrounding the Plaza, and North and South City Parks.
- The Plaza Building, at the center of the Plaza, was the first building in the Patterson Colony, built in 1909. It originally housed the Patterson Ranch Company sales office. The building is listed on the National Register of Historic Places. It is currently used as the town's museum.
- The Del Puerto Hotel, located on the Plaza, was built in 1909. Prospective buyers would stay there while being shown property of the Patterson Colony. This building was demolished in 1998 after sustaining damage in a fire. The City has purchased the property and a new City Hall is being constructed to visually replicate the Hotel.
- The Carnegie Library, at 355 Las Palmas Avenue, was built in 1917. The building is listed on the National Register of Historic Places. It is currently operating as an office building.
- Las Palmas Avenue is a three-mile parkway lined with palm trees from Patterson to the San Joaquin River. Las Palmas Avenue is identified in the City's General Plan (p.VII-5) as a local historic resource. The palms survive from Thomas Patterson's original plantings.
- The Downtown Residential District encompasses the older residential areas surrounding the downtown core. The City's General Plan and Zoning Ordinance contain policies and regulations intended to protect the distinctive historic character of the Downtown Residential District. Planned by Thomas Patterson at the founding of the Patterson Colony, it is characterized by a regular street grid, regular parcelization pattern, and a cohesive tree planting scheme. Homes in the area have been built throughout the Twentieth Century, beginning soon after the founding of the town. These homes have filled in the block pattern established by Thomas Patterson's original plan, creating streetscapes that are varied yet cohesive.

Plan Area

The Plan Area contains about 35 scattered farm complexes of varying age and size along existing streets. Buildings in the Plan Area have been built and added throughout the Twentieth Century, beginning soon after the founding of the Patterson Colony in 1909. These farm complexes consist of farmhouses and associated outbuildings (e.g., garages, sheds, barns and water towers).

None of the buildings within the Plan Area are listed on the National Register of Historic Places, the California Register of Historical Resources, or the other surveys and registers searched by the CCIC. The project site contains no buildings included in local registers of historic resources.

Under *CEQA Guidelines*, even if a resource is not included on any local, state or federal register, or identified in a qualifying historical resources survey, a lead agency may still determine that any resource is an historical resource for the purposes of CEQA (*CEQA Guidelines*, Section 15064.5(a)(4)). Such a determination must be supported by substantial evidence in light of the whole record (*CEQA Guidelines*, Section 15064.5(a)(3)). A lead agency shall consider a resource to be historically significant if it finds that the resource meets the criteria for listing in the California Register. A resource is eligible for listing in the California Register if it:

- A. (Events) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
- B. (Persons) Is associated with lives of persons important in our past; or
- C. (Architecture) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
- D. (Information Potential) Has yielded, or may be likely to yield, information important in prehistory or history.⁶

Individually the buildings in the Plan Area do not appear to meet the eligibility criteria for inclusion in the California Register. Several such buildings are associated with the early years after the founding of the Patterson Colony in 1909. Unlike the Plaza Building or Las Palmas Avenue, properties in the Plan Area were developed by individual buyers of land in the Patterson Colony (and their successors) and therefore lack a direct association with Patterson's founder, Thomas Patterson. Buildings in the Plan Area do not appear to exhibit individual architectural distinction. Typical of rural agricultural development throughout the County, these farm buildings are functional and utilitarian in character and siting, although greater decorative emphasis is often paid to residences, which may include decorative features popular in the early Twentieth Century.

Collectively, the buildings within the Plan Area do not appear eligible for inclusion in the California Register as contributors to a historic district. Existing development within these areas does not embody the unique vision that Thomas Patterson planned for downtown and surrounding residential areas, but was mapped and subdivided along a conventional 1-mile grid, common throughout the Central Valley and the American West. Developed according to the needs, preferences and constraints of individual property owners over time, on lots of varying sizes and configurations, the buildings do not appear to possess the spatial and formal cohesiveness and integrity that characterizes development in downtown Patterson and its older downtown residential neighborhoods.

⁶ Criterion D is generally understood to refer to archaeological resources, which may also be considered historical resources under CEQA. These are discussed and analyzed separately from historic architectural resources.

Conclusion

Substantial evidence would not support a lead agency determination that any of the existing buildings within the Villages of Patterson Plan Area possess the requisite association with significant historical persons or events, or sufficient architectural distinction and integrity to be considered eligible for listing on the California Register, either individually or as contributors to a historic district. As such, these buildings would not be considered historical resources for the purposes of CEQA. Demolition of these buildings, as proposed under the project, would not constitute a substantial adverse change to the significance of an historical resource.

Further study of buildings within the Plan Area might reveal additional information about the former residents of the area, and uncover documentation of the historic development of the area and the changes it has undergone through the years. However, at this juncture it appears that the existing buildings in the Plan Area do not present sufficient potential for historic significance under CEQA to justify exhaustive study. It does not appear likely that further inquiry would yield any information that would materially change the conclusions of this Initial Study. Therefore, the topic of historic architectural resources will not be discussed further in the EIR.

It should be noted, however, that farmhouses, barns, and water towers are familiar features contributing to the visual character of the rural landscape. Demolition of existing buildings and construction of the proposed development would transform the rural visual character of the Plan Area. This issue will be addressed in the EIR under the topic of Visual/Aesthetic Resources.

- b) A records search by the CCIC uncovered no known archaeological resources within the Plan Area and its vicinity. An archaeological resources report will be prepared by an archeologist and this topic of archeological resources will be discussed in the EIR.
- c) There are no unique geological features within the project site. No unique paleontological resources are known to exist within these areas. These areas have been tilled and otherwise disturbed for nearly 100 years. Implementation of the proposed project would not likely unearth and/or directly or indirectly destroy a unique paleontological resource or site or a unique geologic feature. Therefore, the topic of paleontological resources and unique geologic features will not be discussed further in the EIR.
- d) In the event that any human remains are accidentally discovered in the course of construction, the project sponsor will comply with the procedures set forth in *CEQA Guidelines* Section 15064.5(e). Compliance with these provisions would ensure that impacts related to this topic would be less than significant. Therefore, this topic will not be discussed further in the EIR.

VI. GEOLOGY AND SOILS	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Discussion

As with most of the City of Patterson, the Plan Area is located on Quaternary alluvium derived from the Coast Ranges and deposited by streams that drain from the Coast Ranges.⁷ The composition of the alluvium varies, depending on the size of the drainage basins and the type. For the purposes of this Initial Study, the General Plan Background Report forms the foundation of the preliminary analysis.

- a) i) The Plan Area is not within a designated Earthquake Fault Zone as defined by the Alquist-Priolo Earthquake Fault Zone Act of 1972, which regulates development near active faults for the purpose of preventing surface fault rupture hazards to structures for human occupancy.⁸ An Alquist-Priolo Special Studies Zone is located about 20 miles southwest of the project site along the Ortigalita Fault in the Diablo Range and extends into Stanislaus County about seven miles at its southwest edge; however, there has not been sufficient evidence of recent fault rupture on this segment and therefore it has not been identified to warrant zoning under the Alquist-Priolo Act.⁹ No major known or active faults have been mapped as passing through or adjacent to the Plan Area. The nearest identified faults to the project site include the Patterson Pass Fault, located about 20 miles to the northwest and which runs from the Alameda/San Joaquin County boundary towards Livermore; the Tesla Fault, located about 40 miles to the northwest within the Diablo Mountain Range; and the Ortigalita Fault, located about 20 miles to the southwest, also within the Diablo Mountain Range.¹⁰ Given that the site is not located in a designated fault zone, the potential for fault ground rupture hazards is low. Therefore, the topic of fault rupture will not be addressed further in the EIR.
- a) ii) Groundshaking is the vibration which radiates from the epicenter of an earthquake; it is the most serious direct earthquake hazard which can cause the damage or collapse of buildings and other structures.¹¹ Accordingly, moderate ground shaking from earthquakes originating on nearby faults would likely be felt on or near the proposed project site. Pursuant to General Plan Policy VII.A.1, all proposed structures would be designed following recommendations of a geotechnical report to ensure new structures would be able to withstand the effects of seismic activity, including moderate earthquake shaking. Therefore, the topic of seismic ground shaking will not be addressed further in the EIR.
- a) iii) Liquefaction results from loss of soil strength due to seismic forces acting on water-saturated granular soils during a seismic event.¹² Liquefaction is most likely to occur in deposits of weak saturated alluvium or similar deposits of artificial fill. Though liquefaction potential within Patterson exists in low-lying areas composed of

⁷ California Department of Conservation Division of Mines and Geology, *Mineral Land Classification of Stanislaus County, California*, 1993, p. 20.

⁸ California Geological Survey, *Alquist-Priolo Home Page, Table 4-Cities and Counties Affected by Alquist-Priolo Earthquake Fault Zones, May 1, 1999*, <http://www.consrv.ca.gov/CGS/rghm/ap/affected.htm> (accessed January 31, 2006).

⁹ *General Plan Background Report*, p. IX-5.

¹⁰ *General Plan Background Report*, Figure IX-1: Faults in the Vicinity of Patterson.

¹¹ *General Plan Background Report*, pp. IX-5-IX-6.

¹² *General Plan Background Report*, pp. IX-6-IX-7.

unconsolidated, saturated, clay-free sands and silts and is subject to liquefaction resulting from earthquakes on several of the nearby faults, the expected degree of earthquake-caused shaking is relatively low, and it is unlikely that significant liquefaction would occur.¹³ Furthermore, the City of Patterson requires preparation of a geotechnical report to identify any specific areas within the project area that are susceptible to liquefaction and that would provide recommendations to ensure that new structures are able to withstand the effects of seismic activity, including liquefaction. Therefore, the topic of seismic-related ground failure will not be addressed further in the EIR.

- a) iv) Landslides can occur under a variety of conditions, but they commonly involve sloping ground. The City of Patterson and the Plan Area are mostly flat and therefore the susceptibility to landslides is very low.¹⁴ The topic of landslides will not be addressed further in the EIR.
- b) Surface soils in the Plan Area have been repeatedly tilled for agricultural uses and grazing, which could make them more susceptible to erosion than undisturbed soil if not protected. However, given the essentially level topography of the Patterson area, erosion hazard exhibited by surface soils is considered low near the vicinity of the project site.¹⁵ Furthermore, the proposed site development would involve construction of numerous residential and commercial buildings with paved parking and circulation areas over existing surface soils. Therefore, the topic of soil erosion will not be addressed further in the EIR.
- c) Soil types on the project site would determine the susceptibility of certain land areas to erosion and ground failure. All soils have certain engineering properties and characteristics such as erosion potential, shrink-swell behavior, and permeability, which determine building suitability and constrains. Future geotechnical engineering investigation reports will be prepared by the project applicant for submittal to the City of Patterson with the various permit applications. These reports will identify underlying soils and whether certain types would be unstable or which could become unstable as a result of the project. Additionally geotechnical engineering reports will discuss required site preparation and construction recommendations. Therefore, the topic of landslides, lateral spreading, subsidence, liquefaction and collapse will not be discussed further in the EIR.
- d) Future geotechnical engineering report(s) will be prepared by the project applicant for submittal to the City of Patterson with various permit applications. These reports will analyze any substantial risks from expansive soils on site and will recommend construction mitigation measures. Therefore, the topic of expansive soil and risks to life and property will not be discussed further in the EIR.
- e) Proposed developed would be served by the City of Patterson wastewater conveyance system. New sewer lines would be constructed as part of the project. Therefore, the topic of soil capability to support septic tanks will not be discussed in the EIR.

¹³ *General Plan Background Report*, pp. IX-6-IX-7.

¹⁴ *General Plan Background Report*, p. IX-7.

¹⁵ *General Plan Background Report*, p. IX-7.

VII. HAZARDS	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	■	□	□	□
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	■	□	□	□
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	■	□	□	□
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	■	□	□	□
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	□	□	□	■
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	□	□	□	■
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	□	□	□	■

HAZARDS <i>(Continued)</i>	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion

a-d) The property has been used for many years for agricultural production. Although most agricultural chemicals commonly in use today have short persistence, some classes of agricultural chemicals used in the past can leave residues that persist many years after their use has ceased. Storage of fuels and farm equipment over the years may also have released hazardous materials into the soil. Existing buildings on the project site may contain asbestos and lead, which could be released during demolition. The topic of hazardous materials that may exist on site will be discussed further in the EIR.

The proposed project would convert agricultural land to residential and commercial uses, thereby decreasing the usage of pesticides and herbicides in the Plan Area. Operation of the proposed development project would involve routine household and commercial use of small quantities of hazardous materials found in common household products (such as paints, cleaners, solvents, disinfectants, garden chemicals). These products are labeled to inform users of risks, and to instruct them in proper disposal methods. Most of these materials are consumed or neutralized through use, resulting in little hazardous waste. The topic of handling of hazardous materials as part of routine project operations will not be discussed in the EIR.

c, f) The Patterson Airport runway is just over 2 miles west of the Plan Area. The project site is therefore not within any Stanislaus County Airport Land Use Plan Zone. The Plan Area is therefore not in the vicinity of any public or private airport. The topic of potential airport hazards will not be addressed in the EIR.

g) New roads in the Plan Area would be designed to City specifications, accommodating emergency response vehicles such as fire trucks and ambulances. Implementation of the Villages of Patterson Development Plan would not interfere with an adopted emergency response plan or emergency evacuation plan. Therefore, this topic will not be discussed further in the EIR.

h) The area surrounding the proposed project site is largely agricultural or developed. There is no substantial wildland in the vicinity of the project site. Therefore, the proposed development of the Plan Area would not expose people or structures to impacts from wildland fires. The topic of wildland fires will not be discussed in the EIR.

VIII. HYDROLOGY AND WATER QUALITY	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project:				
a) Violate any water quality standards or waste discharge requirements?	■	□	□	□
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	■	□	□	□
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	■	□	□	□
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	■	□	□	□
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	■	□	□	□
f) Otherwise substantially degrade water quality?	■	□	□	□
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	■	□	□	□

HYDROLOGY AND WATER QUALITY <i>(Continued)</i>	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
j) Inundation by seiche, tsunami, or mudflow?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion

- a, c-f) Development of the proposed project would alter on-site drainage patterns and increase the rate of surface runoff due to development of new structures, roadways, and parking lots in the Plan Area. Increased volume and rate of runoff could result in changes in drainage patterns, increases in downstream flooding, and increases in urban runoff pollutant loading, including increases during construction periods. The EIR will evaluate potentially significant impacts associated with alteration of drainage patterns and increased runoff on the project site.

- b) On-site groundwater recharge sources consist of rainwater reaching the subsurface through deep percolation. Development of the proposed project would involve an increase of impervious surface on the site and may affect groundwater recharge potential. Additionally, it is anticipated that the project would include pumping of groundwater for additional wells. The EIR will evaluate potentially significant impacts on groundwater recharge.

- g-i) The Plan Area is currently mapped by the Federal Emergency Management Agency (FEMA) as being within a 100-year flood zone of Salado Creek. Recent flood control projects, increasing the carrying capacity of Salado Creek to the San Joaquin River, have been completed since publication of FEMA Flood Insurance Rate Maps. These are expected to have substantially reduced the potential for flooding within the Plan Area. The Plan Area is not located within any identified dam failure inundation hazard areas. The EIR will discuss the potential flooding impacts at the site.

- j) The project site is not located within the proximity of any natural or manmade large bodies of water where inundation by seiche would be likely. The elevation of the Patterson area (ranging from 120 to 200 feet above mean sea level) would preclude potential coastal inundation hazards. The Plan Area is flat, located over two miles from the base of the Coastal Range and would not be subject to mudflow. Therefore, this topic will not be discussed further in the EIR.

IX. LAND USE AND PLANNING	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project:				
a) Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion

- a) The proposed project would not divide an established community. The Plan Area is located at the northeastern edge of the City’s urban development. The proposed project would convert existing agricultural land to residential and commercial development, extending the City’s existing urban edge northward and eastward. Currently, the eastern portion of the City’s General Plan Planning Area is separated from the rest of the City of Patterson by the SPRR tracks, and by State Highway 33 and the commercial and industrial development along the highway. The formal geometric street plan of the proposed community is designed to enhance connectivity to the existing City along existing collector roads (like Eucalyptus, Olive, Walnut, and Sycamore Avenues) and by alignment of new roadways in the Plan Area with existing roads outside of the Plan Area (like N. 1st Street, Hartley Street and Fishman Avenue). This topic will not be addressed further in the EIR.
- b) The proposed project would require General Plan land use map amendments to change existing land use designations within the Plan Area. Conformity with land use plans and policies will be discussed further in the EIR.
- c) There are no known habitat conservation plans or natural community conservation plans associated with the project site, and therefore this topic will not be discussed further in the EIR.

X. MINERAL RESOURCES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion

According to the *Mineral Land Classification of Stanislaus County, California*¹⁶ the Plan Area is not located within any Mineral Resource Zone. The proposed project would not result in the loss of availability of a known mineral resource recovery site that would be of future value to the region or state. Therefore, there would be no impact and this topic will not be discussed further in the EIR.

XI. NOISE	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

¹⁶ *California Division of Mines and Geology. Mineral Land Classification of Stanislaus County, California, DMG Special Report 173, 1993, Plate 8C.* This report is on file with the City of Modesto Community and Economic Development Department, 1010 Tenth Street, Modesto, CA.

NOISE <i>(Continued)</i>	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion

- a, c, d) The proposed project would increase existing noise levels on the project site resulting from construction and operation of the proposed project. The potentially significant impacts related to noise will, therefore, be analyzed in the EIR.
- b) The project would not involve either pile driving or blasting during construction and does not proposed heavy industries that could cause groundborne noise or vibrations. Therefore this topic will not be discussed further in the EIR.
- e-f) The proposed project is not located within an area identified in the *Stanislaus County Airport Land Use Plan* or within two miles of a public airport or public use airport¹⁷ or in the vicinity of a private use airstrip. Therefore, the project would not expose people residing or working on the project site to excessive noise from aircraft.

¹⁷ Stanislaus County *Airport Land Use Plan*, adopted August 3, 1978.

XII. POPULATION AND HOUSING	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Discussion

- a) The proposed project would directly induce substantial population growth in the Patterson area. According to 2000 U.S. Census information, the population of Stanislaus County was about 447,000, and that of the City of Patterson was about 11,600. More recently, in 2005, the California Department of Finance (DOF) estimated Stanislaus County’s 2005 population to be about 504,000 and the City of Patterson’s population to be about 16,200.

Completion and occupation of the approved and Creekside and Patterson Gardens developments on the west side of town would contribute about 5,555 additional persons to the DOF’s 2005 estimate for Patterson totaling about 21,755 persons for existing and approved residential development.¹⁸

Completion and occupation of the 3,100-unit Villages of Patterson project would contribute an additional approximately 8,175 additional persons (based on General Plan household occupancy assumptions) to the estimated 21,755 total population for existing and approved residential development in Patterson,¹⁹ totaling 29,930 persons. With implementation of Villages of Patterson Development Plan, the City would exceed the

¹⁸ GDR Engineering, *Draft Villages of Patterson Sanitary Sewer Study and Master Plan*, July 2005. Construction and occupancy of the approved Creekside and Patterson Gardens developments is underway. It is assumed that 1,450 persons of the Creekside development were included in the 2005 DOF estimate. The remainder of 2,595 persons from Creekside, and 2,960 persons from Patterson Gardens, totals 5,555 and is assumed not to have been included in the 2005 DOF estimate.

¹⁹ See General Plan EIR, p. II-6. These occupancy rates are applied to the proposed Villages of Patterson Project as follows: 852 Low Density Residential units at 3 persons per unit equal 2,556 persons; 1,709 Medium Density Residential units at 2.5 persons per unit equal 4,272 persons; 539 High Density Residential units at 2.5 persons per unit equal 1,347 persons. 2,556 + 4,272 + 1,347 = 8,175 persons.

29,000 population threshold set out in the General Plan (as revised in 2004) that should be reached before considering an expansion of the area designated for residential development by the General Plan.²⁰

Jobs generated by proposed Light Industrial and Public/Quasi Public development, and by mixed-use commercial development in The Village Circle, are expected to be filled largely by residents of the region, including the residents of Patterson and residents of the proposed Villages. Although new job opportunities within the Villages of Patterson may attract some newcomers to the area, their numbers would be negligible compared to City and County population projections, and could be absorbed within the Villages of Patterson residential development, or elsewhere in the City or County. Increased employment opportunity under the proposed project would not have a significant impact on population.

Population growth, in itself, is not considered an adverse environmental impact. Rather, impacts arising from population growth are embodied in physical environmental consequences such as those related to traffic, air quality, visual changes, public services, utilities and infrastructure. These are discussed under each environmental topic in the Initial Study, or will be addressed in the EIR.

- b-c) The proposed project would include construction of 3,100 new residential units. It would therefore not require construction of replacement housing for the estimated 35 existing home sites within the Plan Area (housing about 105 persons based on the General Plan household occupancy assumption of 3 persons per household) that would be displaced as part of the project. The EIR will not discuss the removal of existing housing units and displacement of persons.

XIII. PUBLIC SERVICES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
<p>Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:</p>				
<p>a) Fire protection?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<p>b) Police protection?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

²⁰ City of Patterson, *General Plan Policy Document*, Policy I.A.2, as revised September 2004.

PUBLIC SERVICES <i>(Continued)</i>	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
c) Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Discussion

The approximately 692-acre project is comprised of commercial, light industrial and residential land uses including 852 low density, 1,709 medium density and 539 high density residential units. The residential component would create an increased demand for schools and park services, and both residential and commercial/light industrial project components would create increased demand for fire and police services.

- a, b) The project could potentially have a physical impact on fire and police services by requiring additional facilities to meet the increased demand. The development program includes a future fire station and a satellite police station within Planning Area 2 at the intersection of N. 1st Street and Olive Avenue. This facility would satisfy additional demand created by the proposed commercial, light industrial, and residential uses. Therefore, the effects of the project on these services will not be discussed in the EIR.
- c) The project is in the boundaries of the Patterson Joint Unified School District. The project will create the need for additional school facilities, and such additional facilities could have an effect on the environment. The project anticipates that three schools will be located in the project area. One of the sites has already been acquired by the District for a school that initially can house students in grades K-8 but that ultimately will be a middle school for students in grades 6-8. The District has complied with CEQA for this school and construction is anticipated to begin in the fall of 2006.

The project master plan anticipates two further school sites within the boundaries of the project area. Both of these sites are anticipated to be used for elementary schools and will house students in grades K-5. While no substantial adverse physical impacts associated with the provision of these new facilities are anticipated, the environmental effects of the construction of these facilities will be included as part of the project in the EIR.

If the PJUSD determines that all or some of the school sites are not necessary facilities or elect not to build on those sites, the sites could be redesignated for medium and low density residential uses. No additional substantial adverse physical impacts associated with the redesignation of these sites are anticipated that would differ from those being studied for the project as a whole. The environmental effects of these possible redesignations thus will be included as part of the EIR.

As for providing adequate school facilities, the District avails itself of the 1998 legislation commonly known as SB-50 that allows school districts to directly charge developer fees on new residential development to construct adequate school facilities to serve these new developments. Prior to SB 50, a state created fee was available to school districts for adjudicatory land use approvals²¹ but school districts, after a series of court cases, could obtain additional monies from cities or counties seeking additional fees for legislative land use approvals or additional mitigation through the CEQA process. These additional fees or mitigations had to be imposed by a city or county. SB-50 allowed school districts to directly charge additional fees and prohibited cities and counties from seeking additional mitigation. The District's current School Facilities Needs Analysis ("SFNA") gives some of the background of this state-mandated provision for school facilities:

In August 1998, the Governor signed into legislation Chapter 407 of the 1998 legislative session ("SB-50") which includes, in part, the Leroy F. Greene School Facilities Act of 1998 ("SFP"). This bill made major changes in the State school building program as well as the level of permissible school fees for districts in California. Education Code 17620 was amended to include the revised provisions of Sections 65995, 65995.5, 65995.6 and 65995.7.

Prior to the passage of SB-50, school districts had been able to rely on a series of appellate court decisions known as "Mira-Hart-Murrieta." These court decisions had allowed or in some instances required municipalities, when making a legislative decision (such as general plan amendments, development agreements, zoning changes, etc.) concerning land use, to consider the impacts of that decision on school facilities and condition their approval on mitigation measures. These cases allow cities and counties to assist school districts by using their legislative power to fully mitigate the impacts of land development on school facilities. These measures could be in the form of mitigation payments higher than a Level I Fee, land dedication or other measures which the land use agencies agreed would mitigate the impacts of the proposed development. In addition, the California Environmental Quality Act ("CEQA") was interpreted by the "Mira" decisions to include mitigation for the environmental impact of a development, providing the school districts with a concurrent means to procure mitigation agreements to fund school facilities to meet the need resulting from additional development.

SB-50 imposes limitations on the power of cities and counties in regard to requiring mitigation of school facilities impacts of new development. This law amends Section 65995(a) to provide that only those fees authorized by Education Code Section 17620 or 65970 may be imposed in connection with or made conditions of any legislative or adjudicative act by a local agency involving planning, use, or development of real property. A copy of Sections 65995-65998 is included as Appendix A for reference.²²

²¹ This fee still exists and is commonly known as a Level I Fee. See Jack Schreder & Associates, School Facility Needs Analysis for Patterson Joint Unified School District, March 14, 2005, p. 3.

²² Ibid., pp. 3-4.

The District used this SFNA to establish Level II Fees of \$4.41 per square foot and a Level III Fee of \$8.81 per square foot.²³ Level II Fees are charged during the time the State Allocation Board is appropriating funds to school districts for new construction as is currently the case. Level III Fees may be triggered when notice is provided that such appropriations are no longer being made.²⁴ In any case, the provisions of SB-50 are deemed to provide full and complete school facilities mitigation and a local agency may not deny or refuse land use entitlements on the basis that school facilities are inadequate, notwithstanding the provisions of CEQA. The provisions are the exclusive means of both “considering” and “mitigating” school facilities impacts of projects.²⁵ Thus, with the Level II statutory fee in place, any impacts of the project on school facilities are mitigated because under SB-50, the statutory fees constitute full and complete mitigation. Consequently, the effect of the project on school facilities will not be further addressed in the EIR.

Since the fees created under a district’s SFNA are valid for only one year²⁶, the PJUSD currently is circulating a new SFNA. This SFNA contains similar provisions to those quoted herein, except that the Level II Fee is set to be increased to \$4.90 per square foot and the Level III Fee is stated to be \$9.80 per square foot.²⁷

- d) The Villages of Patterson Development Plan would include 24.9 acres of park throughout the four Villages with an average of about 4.3 acres per Village including the Village Circle. A 40-acre dual-use basin (detention basin with soccerfields) would be located in Planning Area 24 east of Sycamore Avenue between Kern and Olive Avenues. The Parks and Open Space component of the development plan also includes 6.2 acres of linear parks (or paseos). As described below in ‘Recreation’, development of the project would not have a significant impact on parks and recreation facilities. This topic will not be discussed in the EIR.
- e) The Patterson area is served by regional acute care and emergency care medical facilities in Turlock (about 16 miles, 22 minutes), Modesto (about 18 miles, 26 minutes), and Tracy (about 29 miles, 36 minutes). The Del Puerto Health Care District operates the Del Puerto Health Center, a primary care and urgent care clinic on Ward Avenue at State Highway 33. Past projects in the City have paid a development fee that the City has collected on behalf of the District for capital improvements for its facilities. A similar contribution is expected for the proposed project. Thus, health care facilities will not be discussed in the EIR.

²³ Ibid., pp. 2, 21-22, 25-26.

²⁴ Ibid., pp. 26, App. A – p. 11.

²⁵ Ibid., App. A – p. 12.

²⁶ Ibid., App. A – pp. 10-11.

²⁷ See Jack Schreder & Associates, Patterson Joint Unified School District-School Facility Needs Analysis for Patterson Joint Unified School District, March 3, 2006, p. 3.

XIV. RECREATION	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Discussion

- a) The City’s General Plan standard for parkland provision is five acres of parkland per 1,000 residents. The proposed project would include dedication and development of about 65 acres of new public parks, providing nearly eight acres of parkland per 1,000 new residents of the Villages of Patterson. Parkland provision under the proposed project would thereby assist the City in meeting its standard for provision of parkland citywide. The proposed project would therefore not overtax existing recreational facilities, resulting in substantial physical deterioration of these facilities. Therefore, this topic will not be discussed in the EIR.

- b) The proposed project would require development of new parkland and recreational facilities within the Plan Area through conversion of existing agricultural land to developed urban uses. Impacts associated with this conversion are discussed in this Initial Study, and will be discussed in the EIR, in the context of the conversion of agricultural acreage under each relevant environmental topic (e.g., Agricultural Resources, Cultural Resources, Biological Resources), rather than as a separate impact.

XV. TRANSPORTATION/TRAFFIC	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project:				
a) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?	■	□	□	□
b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	■	□	□	□
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	□	□	□	■
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	□	□	■	□
e) Result in inadequate emergency access?		□	■	□
f) Result in inadequate parking capacity?	■	□	□	□
g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	■	□	□	□

Discussion

a, b) The proposed project would construct approximately 3,100 residential units, and up to approximately 723,800 s.f. of commercial, light industrial and office space, parks, schools and civic uses. The project would also include construction of roads and new surface parking lots. Development of this scale on the project site would generate additional traffic on the local transportation system, and could increase volume-to-capacity ratios on nearby roads (affecting levels of service), and/or increased congestion at intersections. The EIR will discuss potentially significant impacts related to transportation and circulation, including intersection operations.

- c) The proposed project does not include the use of air traffic and would not change any existing air traffic patterns or levels. There would be no air-traffic-related safety risk as a result of the project. Therefore, this topic will not be discussed further in the EIR.
- d) The proposed project would include construction of roads throughout the Plan Area. City and Caltrans traffic safety standards would be followed during the design and construction of these roads to eliminate any potential hazards and maximize safety. Therefore, this topic will not be discussed further in the EIR.
- e) The proposed Villages of Patterson Development Plan includes streets that would provide access to each new structure. The internal roads in the Plan Area would be required to meet City standards for street system and access from surrounding arterials. The City’s Public Works Department and Fire Marshal would review street system design and site plan layout for adequacy of access for emergency vehicles. These steps in the review process would provide for resolution of any emergency access issues. Therefore, the topic of emergency access will not be discussed further in the EIR.
- f) The proposed project would include construction of parking for proposed residential, commercial, office, light industrial, and civic uses. The project would not meet the general requirements for provision of parking under the City’s Zoning Code. The provision of parking in less-than-required amounts would be considered as part of an action on a Planned Unit Development. The topic of parking capacity will be discussed further in the EIR.
- g) The proposed project would include a network of Class I bike paths and Class II bike lanes and pedestrian paths. The EIR will discuss the planned bikeways and identify any potentially significant impacts operation of those bikeways may generate.

XVI. UTILITIES AND SERVICE SYSTEMS	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>

UTILITIES AND SERVICE SYSTEMS <i>(Continued)</i>	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
g) Comply with federal, state, and local statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Discussion

- a) Wastewater disposal is regulated under the federal Clean Water Act and the state Porter-Cologne Water Quality Control Act. The Central Valley RWQCB implements these acts by administering the National Pollution Discharge Elimination System (NPDES), issuing waste discharge permits, and establishing disposal capacity as well as best management practices. The proposed project would result in increased wastewater flows. Flows would be required to comply with NPDES regulatory requirements. Therefore, this topic will not be further discussed in the EIR.

- b) The proposed project would increase demand for wastewater treatment and disposal services. The *Patterson Wastewater Master Plan and Diablo Grande Sewer Line Final Environmental Impact Report Wastewater Treatment Master Plan EIR* (2003 Wastewater EIR)²⁸ analyzed the impacts of expansion of the City's wastewater treatment and disposal facilities to accommodate a Patterson General Plan buildout population of 30,000, as well as additional wastewater flows generated by Phase One of the Diablo Grande project.²⁹ According to that EIR, wastewater flows generated at buildout of the City's General Plan, combined with Diablo Grande contracted flows, would total approximately 4.1 million gallons per day (mgd) and require 400 acres of land for percolation ponds to dispose of treated effluent.

²⁸ City of Patterson, *Patterson Wastewater Master Plan and Diablo Grande Sewer Line Final Environmental Impact Report*, October 7, 2003.

²⁹ Under an agreement between the City and the Western Hills Water District, the City's wastewater treatment facility would accept up to .75 mgd generated by Phase One of the Diablo Grande project.

The City has reassessed and updated its projected wastewater treatment flows and percolation pond land requirements from those anticipated in the 2003 Wastewater EIR.³⁰ The City has found that anticipated wastewater flows at General Plan buildout, with Diablo Grande contracted flows, would total 3.45 mgd (considerably lower than the 4.1 mgd projected in the 2003 Wastewater EIR). Based on actual data averaged over the years since 2000 when flow meters were installed, the City has lowered its flow rate assumptions from about 110 gallons/day/person assumed in the 2003 Wastewater EIR, to 90 gallons/day/person. Actual flows have been measured at about 75 gallons/day/person, so this assumption is conservative. Additionally, recent improvements to sanitary sewer trunk lines have reduced stormwater infiltration, and recent improvements to the stormwater system have decreased stormwater diversions into the sanitary sewer collection system.

The City has also found that the City's existing percolation ponds (totaling about 100 acres) have considerably higher percolation rates than previously assumed. Through a combination of percolation and evaporation, the total projected disposal capacity for the existing percolation ponds is estimated to be 3.47 mgd, and is therefore sufficient to cover the 3.45 mgd wastewater flows projected for General Plan buildout, plus Diablo Grande flows.

The City's lowered assumptions for projected wastewater treatment needs at General Plan buildout, together with increased assumptions for percolation rates of existing ponds, eliminates the need to construct new percolation ponds. Potential environmental impacts arising from construction of new ponds are thereby avoided (e.g., potential impacts to agricultural lands, biological resources, and cultural resources). The potential growth-inducing impact of excess treatment capacity is also avoided since excess treatment capacity would not be available to additional new development, unless it is already anticipated under the General Plan.

Wastewater treatment for a projected population of 30,000 at General Plan buildout was analyzed in the 2003 Wastewater EIR. Wastewater treatment for the proposed Villages of Patterson project is therefore anticipated and covered under that EIR. Construction of additional percolation ponds would not be necessary to meet the increased demand generated by the proposed project. Therefore, the topic of wastewater treatment capacity will not be discussed in the EIR.

- c) The project would require the construction of new stormwater facilities or expansion of existing facilities. The proposed stormwater system will be discussed in the EIR in the context of the Hydrology and Water Quality discussion. Construction impacts of new stormwater infrastructure will be discussed in the EIR, in the context of construction impacts under each relevant environmental topic (e.g., Transportation, Air Quality, Noise, Archaeological Resources), rather than as a separate impact.
- d) A Water Supply Assessment (WSA) is being prepared for the proposed project, to meet the requirements of California Water Code Section 10910-10915 (as amended by SB610). The topic of water supply will be discussed in the EIR.

³⁰ LEE & RO, Technical Memorandum from Bob Godwin to Ignacio Lopez, regarding the Status of the Treatment Plan and Percolation Ponds and Projected Wastewater Capacity Needs, February 28, 2006.

- e) See Response “b)” above.
- f, g) The City’s non-recyclable waste is disposed of at the Fink Road Landfill, owned and operated by Stanislaus County, located west of Crows landing. The landfill has a permit from the California Integrated Waste Management Board to dispose of up to 1,500 tons per day (tbd). The facility accepts about 290 tpd from the County and communities within the County and region, and therefore uses a relatively small portion of its permitted daily capacity.³¹ Ample unused capacity therefore exists to accept new solid waste generated by the proposed project. Therefore, the topics of landfill space and compliance with federal, state, and local laws governing waste disposal will not be discussed further in the EIR.

XVII. MANDATORY FINDINGS OF SIGNIFICANCE	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	■	□	□	□
b) Does the project have impacts that are individually limited, but cumulatively considerable (“Cumulatively considerable” means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	■	□	□	□
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	■	□	□	□

³¹ <http://www.ciwmb.ca.gov>, website accessed January 25, 2006.

Discussion

- a) As discussed in the Biological Resources section of this Initial Study, implementation of the project may have the potential to degrade the quality of the environment and reduce protected and/or sensitive species habitat. This topic will be discussed in the EIR.

As discussed in the Cultural Resources section of this Initial Study, the project would not have a significant adverse effect on the significance of historic architectural resources as defined by CEQA and therefore this topic will not be discussed in the EIR. The project may potentially affect archaeological resources and this topic will be discussed in the EIR.

- b) Implementation of the proposed project would contribute to significant cumulative traffic and air quality impacts that could be cumulatively considerable. These potentially significant impacts will be discussed further in the EIR.
- c) Significant environmental impacts of the proposed project will be discussed in the EIR.

APPENDIX B: TRAFFIC STUDY

Note: Appendices to the report in this Appendix B to the EIR are not reproduced here. They are available for review at the City of Patterson Community Development Department (City Hall, 1 Plaza, Patterson, CA 95363) as part of the project file.

FINAL

The Villages of Patterson EIR Traffic Study



Source: William Hezmalhalch Architects, Inc.

In the City of Patterson

February 26, 2007

FINAL

**The Villages of Patterson
EIR Traffic Study**

In the City of Patterson

February 26, 2007

**Prepared by:
TJKM Transportation Consultants
5960 Inglewood Drive, Suite 100
Pleasanton, CA 94588-8535
Tel: 925.463.0611
Fax: 925.463.3690**

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INTRODUCTION AND SUMMARY

Introduction

The purpose of this report is to document the traffic impacts of the proposed Villages of Patterson development located in the northeast quadrant of the City of Patterson's current General Plan Area in Stanislaus County. The proposed Project is located within the area north of Walnut Avenue, south of Eucalyptus Avenue, east of State Highway 33 and west of Sycamore Avenue. The proposed Project covers an area of approximately 692 acres.

The Villages of Patterson will be a new residential and mixed-use village community with approximately 852 Low Density Residential dwelling units, 1,709 Medium Density Residential dwelling units, 232 High Density Residential dwelling units and 307 mix of multi-family residential including live-work dwelling units at the Village Circle for a total of 3,100 dwelling units.

In addition, the proposed Project consists of approximately 623,800 square feet of Light Industrial development, approximately 433,400 square feet of Public/Quasi-Public uses and up to approximately 100,000 square feet total including office, retail, civic uses and home-based business at the Village Circle.



The Stanislaus Council of Government (StanCOG) countywide gravity based average daily traffic (ADT) model was used as the basis for the development of a peak hour model. To reflect the latest travel patterns, the model was calibrated to the latest peak hour turning movements at 26 study intersections and 11 link segments. After calibration, all study intersections and roadway links in the model reflect accuracy within 10 percent of the traffic counts.

Summary

The following five scenarios were analyzed in this study:

- Existing Conditions
- Existing plus Approved (EPAP) Conditions
- EPAP plus Project Conditions
- Future Year 2030 Base Conditions
- Future Year 2030 Base plus Project Conditions

Currently, all study intersections and roadway segments operate acceptably at LOS C or better during the peak hours. Eight intersections are signalized.

EPAP Conditions

In this scenario, seven study intersections not currently signalized are expected to need signalization. The existing interchange intersections of Sperry Avenue at I-5 are expected to need signalization in this scenario. In addition, improvements would also be required at seven additional intersections. With the proposed mitigations, all 26 study intersections are expected to operate acceptably during the a.m. and p.m. peak hours in this scenario. All the study roadway segments are expected to operate acceptably with the existing lane geometry in this scenario.

EPAP plus Project Conditions

In this scenario, 10 study intersections are expected to require signalization in addition to the intersections currently signalized. This includes seven new signals needed for EPAP conditions. With the identified mitigations, all study intersections are expected to operate acceptably in this scenario. All the study roadway segments are expected to operate acceptably with the existing lane geometry in this scenario.

Future Year 2030 Conditions

Based on future funding information, improvements are planned by Year 2030 were assumed at the intersections of Rogers Road, Baldwin Road and American Eagle Drive along Sperry Avenue, SR 33/ Las Palmas Avenue, Poplar Avenue/Las Palmas Avenue, Carpenter Road/West Main Street, Crows Landing Road/West Main Street as shown on Figure 11.

The intersections of Poplar Avenue/Las Palmas Avenue, Carpenter Road/W. Main Street and Crows Landing Road/ W. Main Street are planned to be signalized by Year 2030. In addition, signalizations would be required at seven intersections.

With the planned improvements and the proposed mitigations all the study intersections are expected to operate acceptably in this scenario. All study roadway segments are expected to operate acceptably in this scenario.

Future 2030 Base Year plus Project Conditions

In this scenario, the two intersections of SR 33 at Eucalyptus Avenue and Olive Avenue are expected to need signalization in addition to the intersections already signalized under Year 2030 Base Conditions.

With the identified mitigations and planned improvements, all study intersections are expected to operate acceptably. All study roadway segments are expected to operate acceptably with the existing lane geometry in this scenario.

Several sources of funding would be available to mitigate the impacted intersections. A Mello-Roos community facilities district (CFD) has been created to fund a majority of the impacted intersections. It will be supplemented with additional funding from the Stanislaus County Public Facilities Fees (PFF) for several of the county intersections.

The City of Patterson will be starting an annual traffic monitoring and improvement triggering analysis. The purpose is to anticipate roadway impact in the two, four, and six-year looks and make any necessary roadway improvements in advance of the anticipated demand. It is in the best interest of the City of Patterson to provide a good level of traffic operations for all existing and future residents. The City is committed to implement the recommendations based on the results of the annual traffic monitoring and triggering analysis.

EXISTING CONDITIONS

The City of Patterson is located approximately 35 miles south of the junction of I-205 and I-5. Like most cities in the Central Valley, it was originally built to support the agricultural economic development of the surrounding area. Patterson is a small but growing city surrounded by agricultural land. With agriculture as its primary economic base, orchards of apricots, almonds and walnuts, as well as row crops of dry beans, tomatoes, broccoli, spinach, peas and melons play an important role in Patterson's history. Patterson is the "Apricot Capital of the World".

The steady growth population in the last 20 years can be attributed primarily to workers who live in Patterson and work in the San Francisco-San Jose-Tri-Valley areas and secondarily in the Modesto area. The most substantial growth occurred between 1980 and 1990, with a growth rate of approximately 120 percent to a population of approximately 8,870 in 1990. The population growth slowed somewhat after 1990, to a population of approximately 9,920 in 1998. The current population is approximately 16,200, reflecting substantial growth in the recent past.

The overall population growth has also produced an overall increase in traffic volumes on roadway networks in the area.

Roadway Network

For regional travel, the City of Patterson relies primarily on Interstate Highway 5 (I-5), a major north-south freeway to the west of the city limits. I-5 connects to I-580, approximately 15 miles to the north of Patterson. I-5 and I-580 provide access to regional employment centers in Pleasanton, San Ramon and the rest of the San Francisco Bay Area. Freeway bound project traffic from the Villages of Patterson project is expected to use primarily Sperry Avenue. Figure 1 shows the existing local street circulation in the project area and the study locations. Important roadways in the project vicinity are described below:

Interstate 5 is a four-lane freeway near Patterson. According to the 2005 traffic counts obtained from the Caltrans website, I-5 carries between 38,000 to 40,000 vehicles per day (vpd) in the vicinity of Sperry Avenue.

The interchange of I-5/Sperry Avenue is configured as a tight diamond with a narrow local road underpass and a steep drop in grade next to the northbound on-ramp. The ramps are one lane in each direction.

State Route 33 (SR 33) is located on the western edge of the Project area, approximately three miles to the east of I-5. SR 33 provides north-south access to Westley to the north and the City of Newman to the south. Its ADT is approximately 6,000 vpd.

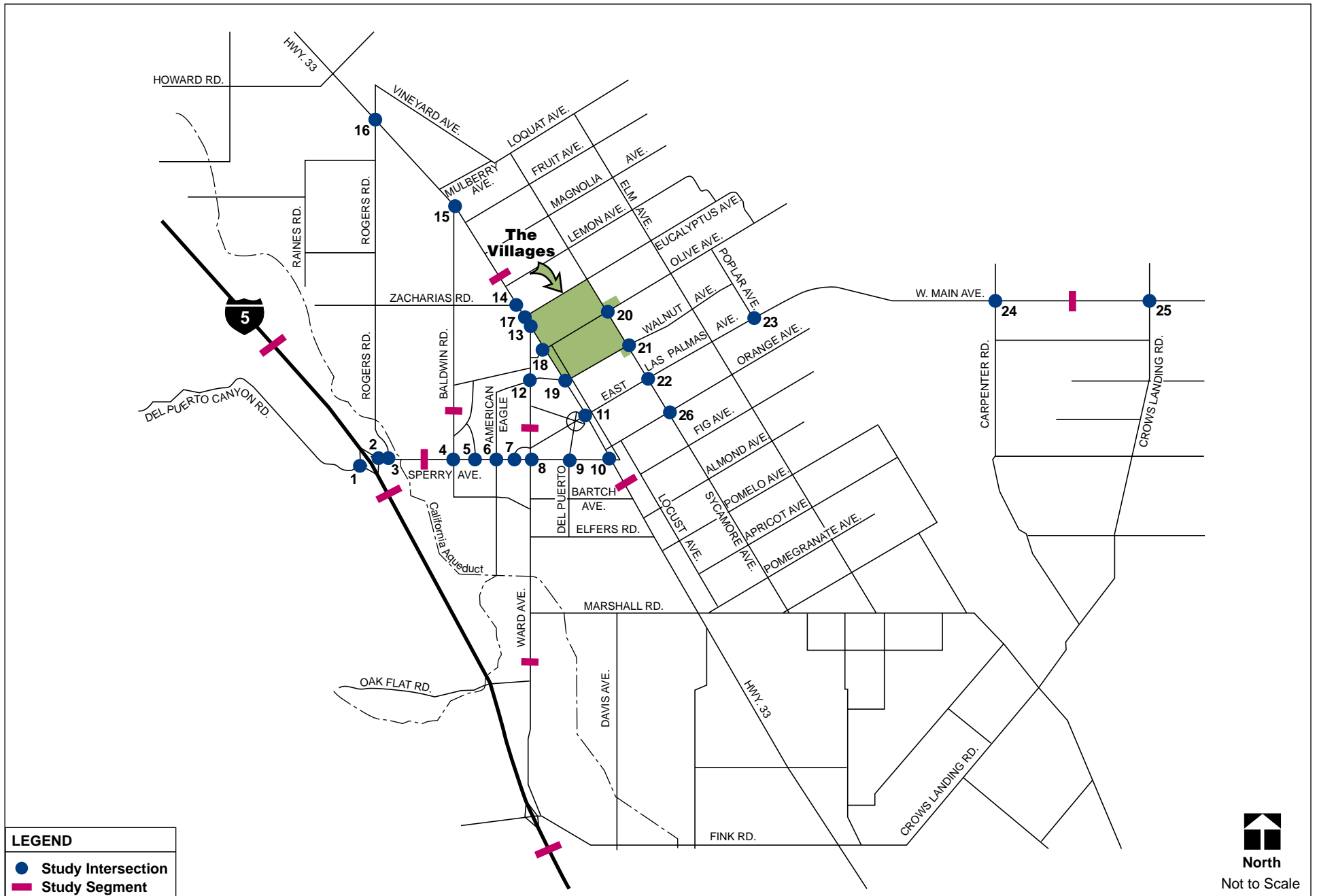
Sperry Avenue is a two lane major arterial roadway that serves as the major route of travel between I-5 to the west and the City of Patterson the east. Sperry Avenue connects I-5 to the west and SR 33, three miles to the east. Near the freeway, its ADT is approximately 12,200 vpd.

East Las Palmas Avenue to the south of the project is a three-lane major east west arterial including a center two-way left-turn lane west of Sycamore Avenue where it narrows to a two-lane road. To the west of SR 33, four major streets form a roundabout at Las Palmas Avenue. Traffic destined for Modesto currently uses either Las Palmas Avenue or SR 33. Its ADT is approximately 5,000 vpd.

East Las Palmas Avenue is generally a wide two-lane road with palm trees on each side of the road. The palm tree streetscape continues to the west of SR 33 at the roundabout.

Sycamore Avenue borders the east side of the proposed Project. It is a two lane north-south roadway and is classified as a collector roadway in the City's General Plan. Sycamore Avenue links Loquat Avenue to the north and E. Marshall Road to the south, a distance of seven miles.

Eucalyptus Avenue borders the north side of the Project area. It is an existing two lane two-way roadway.



City of Patterson
 The Villages of Patterson Traffic Study
Vicinity Map and Study Locations

Figure
1



General Plan Standards of Significance

The City's 2004 General Plan, Policy III.A.2 states that "The City shall endeavor to maintain a Level of Service (LOS) "D", as defined by the 2000 Highway Capacity Manual (HCM) or subsequent revisions, on all streets and intersections within the City."

There are several software packages that have been developed to implement HCM. For coordinating and optimizing signal timing, Synchro's delay method is the most widely implemented and used. Based on the field validation for signalized intersections, the New England Section ITE Technical Committee has concluded that only Synchro consistently calculated queues close to field values and performed well in emulating the HCM. In this report, the Synchro method will be used in computing the level-of-service analysis. The analysis will use LOS D as the impact threshold, in which impact below the threshold will be considered unacceptable. A description of the levels-of-service analysis methodology is contained in Appendix A.

Of the 26 study intersections, 18 are unsignalized. The method of unsignalized intersection capacity analysis used in this study is from Chapter 10, "Unsignalized Intersections" of the *Highway Capacity Manual, Special report No. 209*, Transportation Research Board, updated October 2000.

This method applies to two-way STOP sign or YIELD sign controlled intersections (or one-way STOP sign or YIELD sign controlled intersections at three-way intersections). At such intersections, drivers on the minor street are forced to use judgment when selecting gaps in the major flow through which to execute crossings or turning maneuvers. Thus, the capacity of the controlled legs of an intersection is based on three factors:

1. The distribution of gaps in the major street traffic stream.
2. Driver judgment in selecting gaps through which to execute their desired maneuvers.
3. Follow-up time required to move into the front-of-queue position.

The level of service criterion for Two-Way STOP controlled intersections is somewhat different from the criterion used in Chapter 9 for signalized intersections. The primary reason for this is the difference that drivers expect a signalized intersection to carry higher traffic volumes than unsignalized intersections. Additionally, several driver behavior conditions combine to make delays at signalized intersections less onerous than at unsignalized intersections.

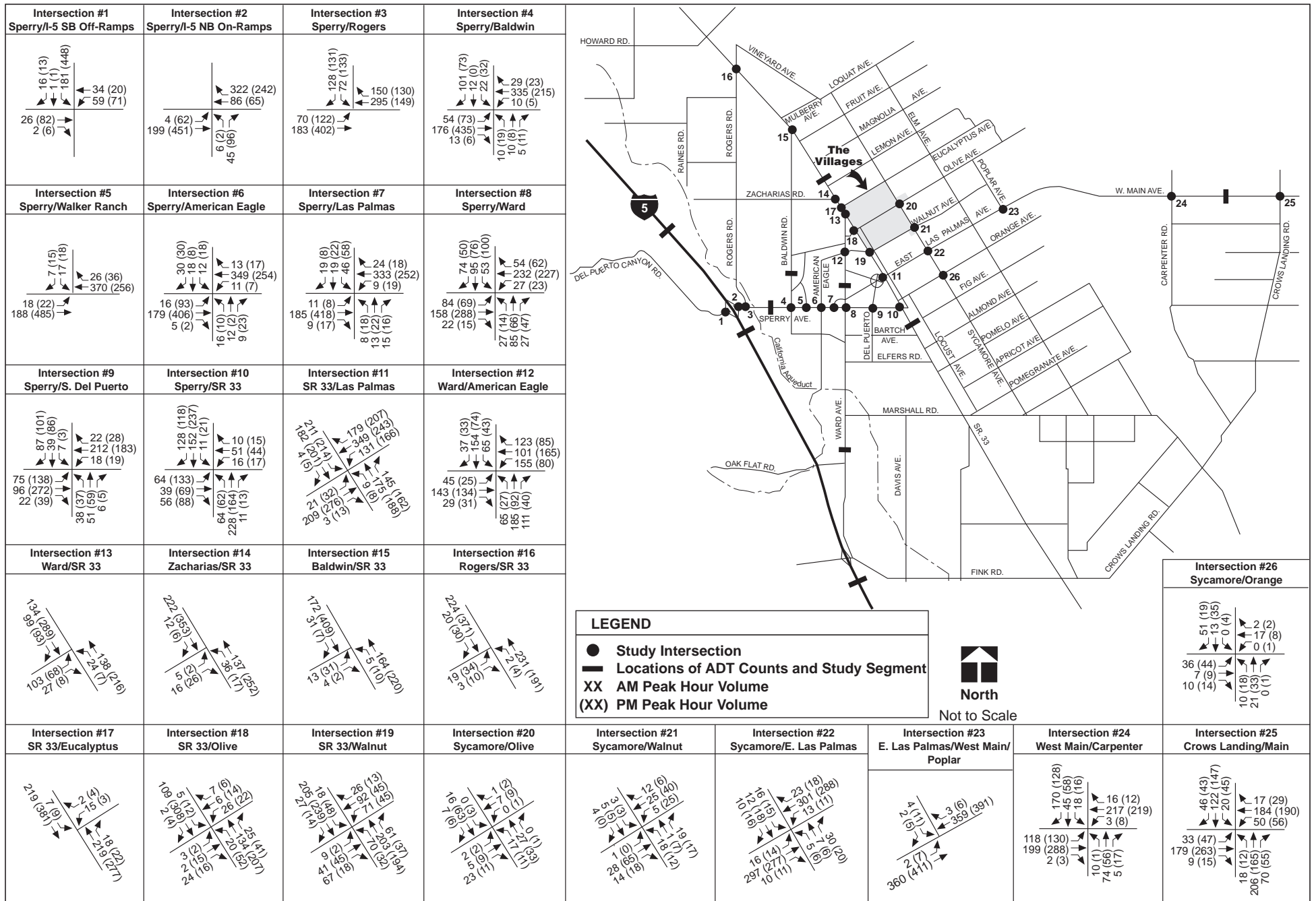
The LOS is reported for both the minor approach as well as for the whole intersection. Depending on the availability of gaps, the minor approach might be operating at LOS D, E or F while the intersection LOS operates at LOS C or better. A minor approach that operates at LOS D, E or F does not automatically translate into a need for a traffic signal. A signal warrant would still need to be met. There are many instances where only a few vehicles are experiencing LOS D, E or F on the minor approach while the whole intersection operates at an acceptable LOS. A signal is usually not warranted under such conditions.

Other improvement criteria considered include traffic conditions where a left-turn pocket might be required to safely accommodate projected volumes due to safety reason. For example, for safety reasons, due to higher speed on major streets it is safer to provide left-turn pocket to channelize heavy left-turning traffic so that it will not impede the flow of through traffic. This will also provide for safer and better traffic operations on the roadway. For this study, a left-turn pocket will be recommended when the projected left-turn volumes at a major intersection are more than 150 vehicles during the peak hour.

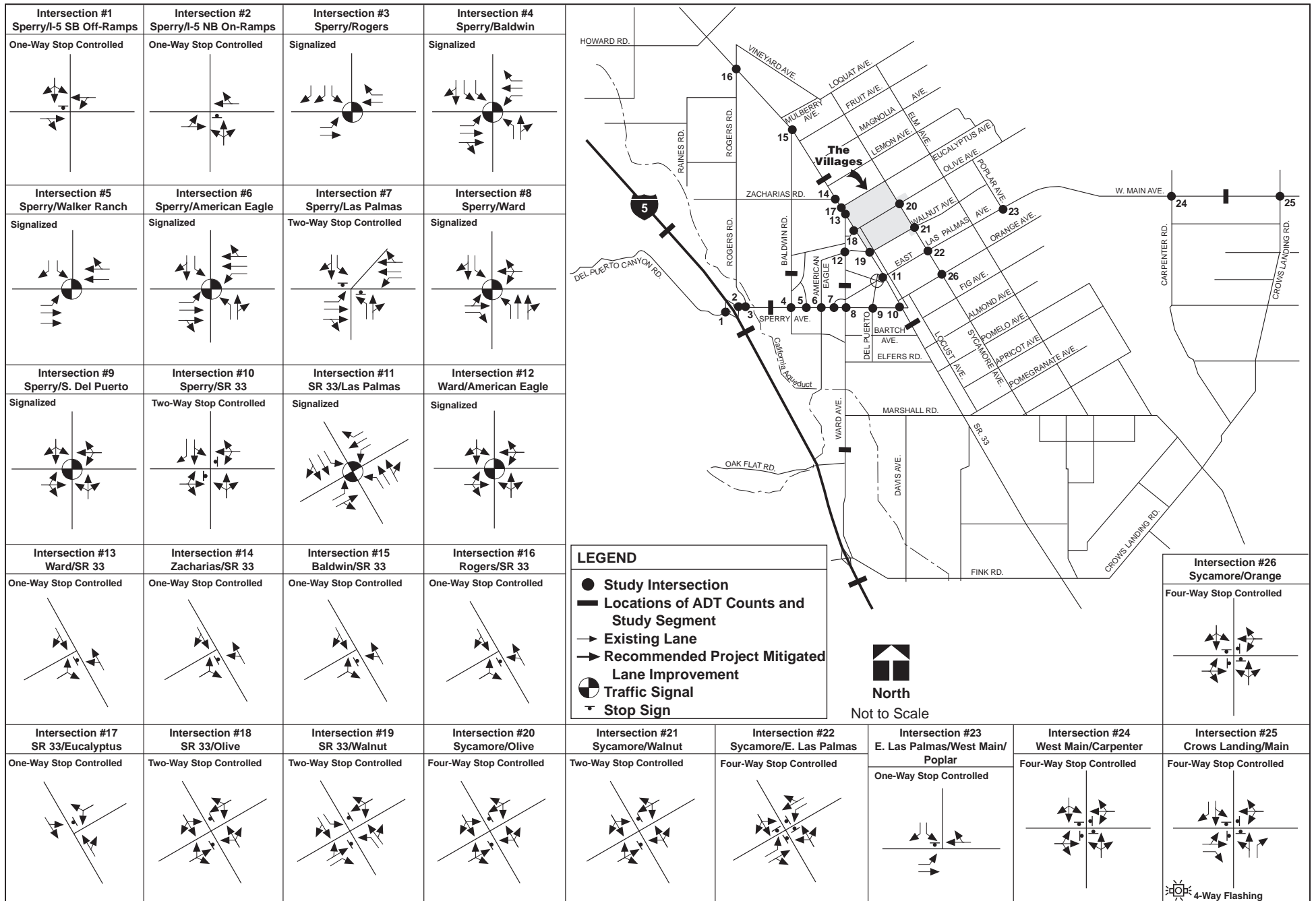
Level of Service Analysis

Based on consultations with the City, 26 intersections and 11 roadway segments have been selected for analysis. The a.m. and p.m. peak hour turning movement counts were obtained during November 2005. The turning movement counts are shown in Figure 2 while the existing lane geometry is shown in Figure 3. The intersection levels of service analysis results are shown in Table I. Detailed calculations are shown in Appendix B.

Table II shows the arterial levels of service under existing conditions. Currently, all arterial segments operate acceptably during the a.m. and p.m. peak hours. Table III summarizes the results of the freeway level of service analysis for the study segments on I-5. Currently, all three freeway segments operate acceptably during the peak hour.



City of Patterson
The Villages of Patterson Traffic Study
Existing Peak Hour Turning Movement Volumes



City of Patterson
 The Villages of Patterson Traffic Study
Existing Lane Geometry

TABLE I: INTERSECTION LEVELS OF SERVICE – EXISTING CONDITIONS

<i>Intersection</i>	<i>Existing Intersection Control</i>	<i>A.M.</i>		<i>P.M.</i>	
		<i>Delay</i>	<i>LOS</i>	<i>Delay</i>	<i>LOS</i>
1. Sperry Ave/I-5 SB Off-Ramps	Unsignalized	8.6 (11.6)	A (B)	19.0 (25.2)	A (D)
2. Sperry Ave/I-5 NB On-Ramps	Unsignalized	0.9 (10.2)	A (B)	2.3 (13.0)	A (B)
3. Sperry Ave/Rogers Road	Signalized	7	A	7.9	A
4. Sperry Ave/Baldwin Rd	Signalized	7.9	A	6.3	A
5. Sperry Avenue/Walker Parkway	Signalized	2.6	A	2.2	A
6. Sperry Ave/American Eagle Dr	Signalized	3.7	A	5.5	A
7. Sperry Ave/Las Palmas Ave	Unsignalized	2.6 (14.0)	A (B)	3.0 (17.0)	A (C)
8. Sperry Ave/Ward Ave	Signalized	8.1	A	8.9	A
9. Sperry Ave/S Del Puerto Ave	Signalized	4.5	A	6	A
10. Sperry Ave/SR-33	Unsignalized	6.1 (18.5)	A (C)	14.6 (41.6)	B (E)
11. SR-33/Las Palmas Ave	Signalized	11.7	B	11.9	B
12. Ward Ave/ American Eagle Dr	Signalized	8.5	A	5.9	A
13. Ward Ave/SR-33	Unsignalized	3.5 (12.3)	A (B)	1.7 (14.3)	A (B)
14. Zacharias Rd/SR-33	Unsignalized	1.2 (10.2)	A (B)	0.7 (11.0)	A (B)
15. Baldwin Rd/SR-33	Unsignalized	0.6 (10.7)	A (B)	0.9 (14.7)	A (B)
16. Rogers Rd/SR-33	Unsignalized	0.6 (11.9)	A (B)	1.0 (13.5)	A (B)
17. SR-33/Eucalyptus	Unsignalized	0.6 (11.8)	A (B)	0.3(12.0)	A (B)
18. Olive Avenue/SR-33	Unsignalized	2.6 (11.4)	A (B)	2.6 (17.3)	A (B)
19. Walnut Avenue/M Street/SR-33	Unsignalized	9.9 (34.5)	A (D)	5.2 (20.6)	A (C)
20. Olive Ave/Sycamore Ave	All-Way Stop	7.1	A	7.3	A
21. Walnut Ave/Sycamore Ave	Unsignalized	7.0 (9.3)	A (A)	8.1 (9.8)	A (A)
22. Las Palmas Avenue/Sycamore Ave	All-Way Stop	13.4	B	12.4	B
23. Poplar Ave/Las Palmas Ave	Unsignalized	0.1 (13.6)	A (B)	0.6 (11.4)	A (B)
24. Carpenter Rd/W Main Ave	All-Way Stop	12.1	B	14.3	B
25. Crows Landing Rd/W Main Ave	All-Way Stop	13.2	B	16.3	C
26. Sycamore Av./Orange Ave.	All-Way Stop	7.2	A	7.4	A

Notes: LOS = Level of Service

X (X) = Intersection level of service (Level of service for the minor approach)

X.X (X.X) = Average Intersection Delay in seconds per vehicle (Average Delay in seconds per vehicle for the minor approach)

TABLE II: ARTERIAL LEVELS OF SERVICE – EXISTING CONDITIONS

No.	Roadway Segment	Direction	Dir. Lanes	Capacity	A.M. Peak Hour			P.M. Peak Hour		
					Volume (Veh.)	Speed (mph)	LOS	Volume (Veh.)	Speed (mph)	LOS
1.	Sperry Ave. e/o Rogers Rd.	EB	2	2,280	255	26.5	C	535	27.0	C
		WB	2	2,280	445	26.0	C	279	26.5	C
2.	Baldwin Rd, n/o Sperry Ave.	NB	1	890	93	19.5	C	104	19.5	C
		SB	1	890	135	19.0	C	105	19.5	C
3.	SR-33, n/o Zacharias Rd.	NB	1	1,140	178	31.0	C	254	30.5	C
		SB	1	1,140	234	30.5	C	359	29.5	C
4.	SR-33, s/o Sperry Ave.	NB	1	1,140	303	30.0	C	239	30.5	C
		SB	1	1,140	224	30.5	C	342	30.0	C
5.	Ward Ave., n/o Las Palmas Ave.	NB	1	1,140	361	26.0	C	159	26.5	C
		SB	1	1,140	338	26.0	C	185	26.5	C
6.	Ward Ave., s/o Marshall Rd.	NB	1	1,140	139	26.5	C	127	26.5	C
		SB	1	1,140	144	26.5	C	114	26.5	C
7.	E. Las Palmas Ave., e/o Sycamore Ave.	EB	1	1,140	343	26.0	C	312	26.0	C
		WB	1	1,140	337	26.0	C	317	26.0	C
8.	Main St., e/o Carpenter Rd.	EB	1	1,140	222	27.0	C	321	26.0	C
		WB	1	1,140	236	27.0	C	239	26.5	C

Counts: TJKM

Source: Highway Capacity 2000- Urban Streets Analysis

TABLE III: FREEWAY LEVELS OF SERVICE – EXISTING CONDITIONS

No.	Freeway Segment	Lanes	Capacity	Peak Hour		
				Volume	V/C	LOS
1.	I-5, n/o Sperry Ave.	4	9,200	4,650	0.51	C
2.	I-5, s/o Sperry Ave.	4	9,200	3,900	0.42	B
3.	I-5, s/o Fink Rd.	4	9,200	5,000	0.54	C

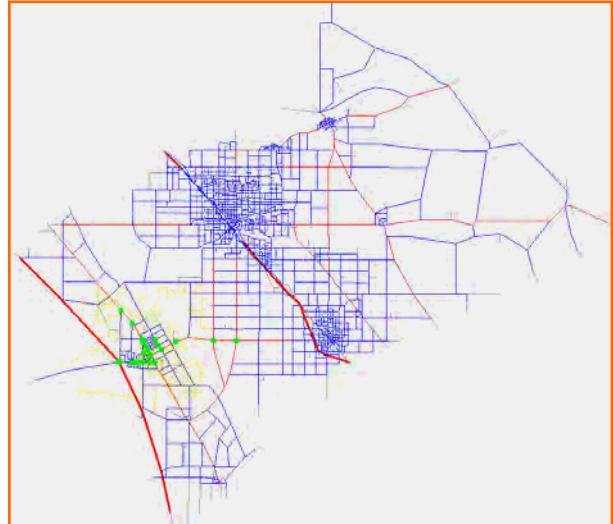
Counts: Caltrans

Source: Highway Capacity 2000- Basic Freeway Segments Analysis

TRAVEL DEMAND MODEL

A long-range traffic-forecasting model was used to assess the impact of the proposed Villages of Patterson project. The StanCOG (Stanislaus County Council of Governments) countywide gravity based model was used in the study.

TJKM obtained the most current StanCOG model for use in the study. The StanCOG model is used for the Stanislaus County Regional Transportation Plan (RTP). The StanCOG modeling area is the whole region where the StanCOG model operates as shown in the figure to the right. It is not a part of the study to validate the whole StanCOG model. Therefore, it is assumed that this model provides a reasonable travel pattern including the Origin-Destination (OD) demands and the route choices among the different areas within the modeling areas.



The current StanCOG model is a daily model. The model estimates the daily trips using a trip generation equation for each land use type. After trip generation, the model distributes all the trips between their origins and destinations onto the roadway network in the model and assigns trips to individual streets.

As part of this project, an a.m. and p.m. peak hour model was developed from the StanCOG model. A detailed model calibration was made based on the counts collected at the 26 study intersections and 11 roadway segments. The Traffic Analysis Zones (TAZs) for the project and its vicinity are shown in Figure 4. TAZs are used to represent geographical locations in the model. Trips are generated at the TAZ level and distributed onto the roadway network.

Model calibration is a process to adjust the model estimate to the existing traffic condition as reflected in the traffic counts. Demand forecasting models need to be demonstrably reliable and credible after the model calibration before being used for analysis on a project. A central point of many public hearings and meetings concerning city and private plans and projects focus is the credibility of the forecasting model. Therefore, it is important that the analysis tools not become a point of contention, so that the real issues can be properly understood and addressed both within the design team and public meetings. The calibration effort of the Patterson model was pursued with this goal in mind. Since the R^2 (which is a measure of the accuracy of the traffic estimates) is nearly 0.9 after model calibration (verses 0.5 or less before calibration), it can be concluded that TJKM has calibrated the model to a very high level of accuracy.

After the model was calibrated, the difference method¹ (Wu & Thnay, ITE 2001) was used to obtain future link level and intersection turning movement volumes based on the calibrated OD matrices. These volumes were used to calculate the level of service for the study intersections in this project. Detailed model calibration information is contained in Appendix C.

Reference [1] Wu, J.H. and C. Thnay (2001), "An OD Based Method for Estimating Link and Turning Volume Based on Counts", Proceedings of Institute of Transportation Engineers (ITE) District 6 Annual Conference, July 9-12, 2001.



City of Patterson
 The Villages of Patterson Traffic Study
Traffic Analysis Zones (TAZ)

Figure
4



EXISTING PLUS APPROVED PROJECTS (EPAP) CONDITIONS

Methodology

This scenario adds traffic from the approved projects in the City of Patterson to the existing traffic volumes. Some of the major approved project includes the West Patterson Business Park, Patterson Gardens and Walker Ranch. The West Patterson Projects EIR was approved in January 9th 2003. The approved project land use includes residential as well as non-residential uses of light industrial, R & D, highway commercial and commercial/office.

The calibrated StanCOG Model was used to forecast turning movement volumes and link volumes at the study locations.

Level of Service Analysis

Based on the calibrated existing network, the existing plus approved project (EPAP) traffic was distributed onto the roadway system. The forecasted peak hour turning movements at all the study intersections are shown in Figure 5. Figure 6 shows the proposed lane geometry to accommodate the projected traffic at the study intersections in this scenario. Based on the existing intersections and roadway geometry, 9 of the 26 intersections would deteriorate to worse than LOS D conditions during one of the peak hours. With the proposed mitigations all study intersections are expected to operate acceptably during the a.m. and p.m. peak hours in this scenario. Table IV summarizes the intersection level of service analysis results under EPAP conditions. Detailed calculations are shown in Appendix D.

Based on the results of the projected traffic at the buildout of approved and proposed project trips, intersections that require improvement measures in this scenario are described below:

1. Sperry Ave/I-5 SB Off-Ramps

Signalize intersection. Southbound: add left turn lane. Westbound: add two left turn lanes.

2. Sperry Ave/I-5 NB On-Ramps

Signalize intersection. Eastbound: add left turn lane. Westbound: add a right turn lane. Northbound: add right turn lane.

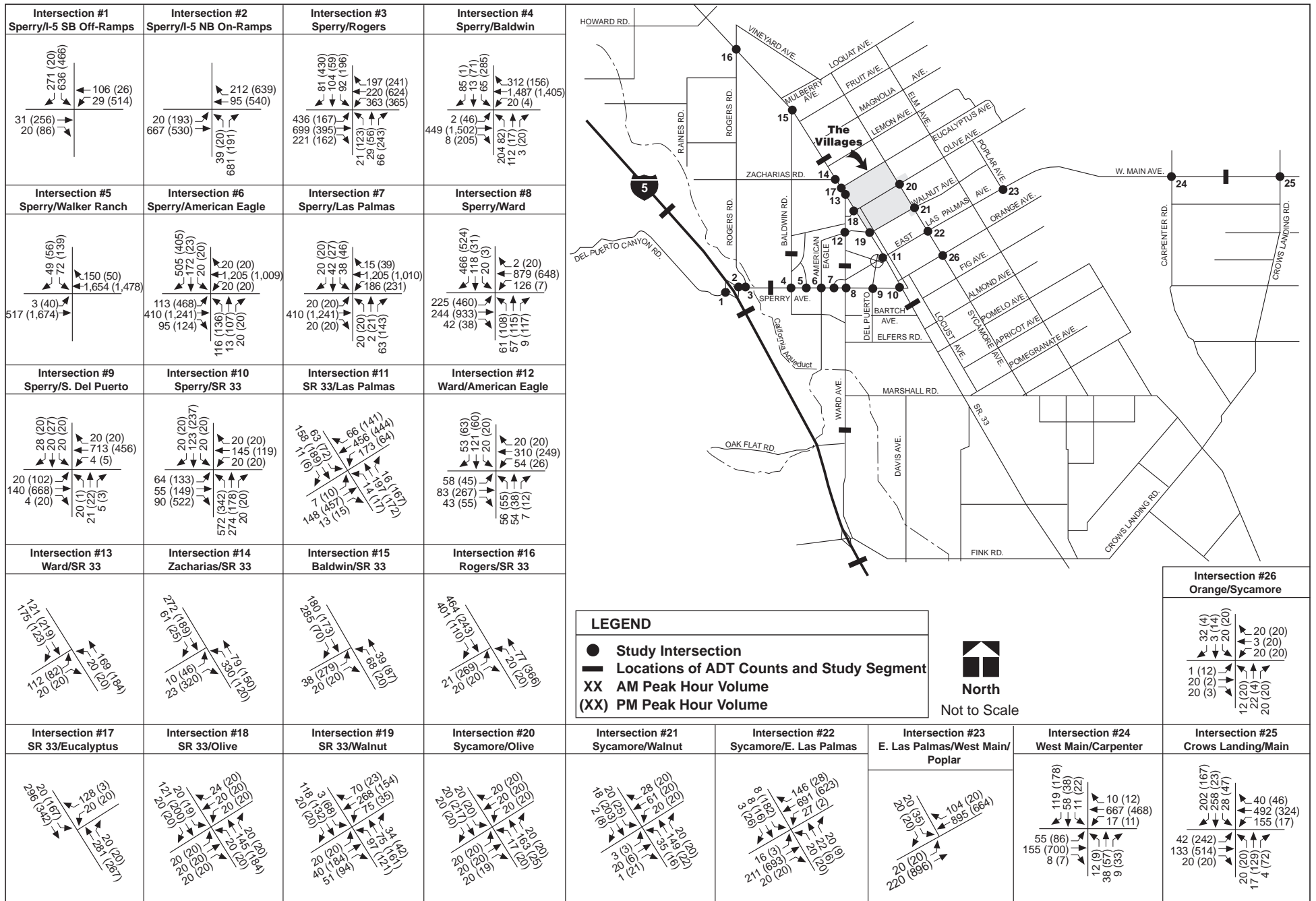
3. Sperry Ave/Rogers Rd

Eastbound: add a left turn lane and a right turn lane. Westbound: add two left turn lanes. Northbound: add a left turn lane and a shared through and right turn lane. Southbound: add a through lane.

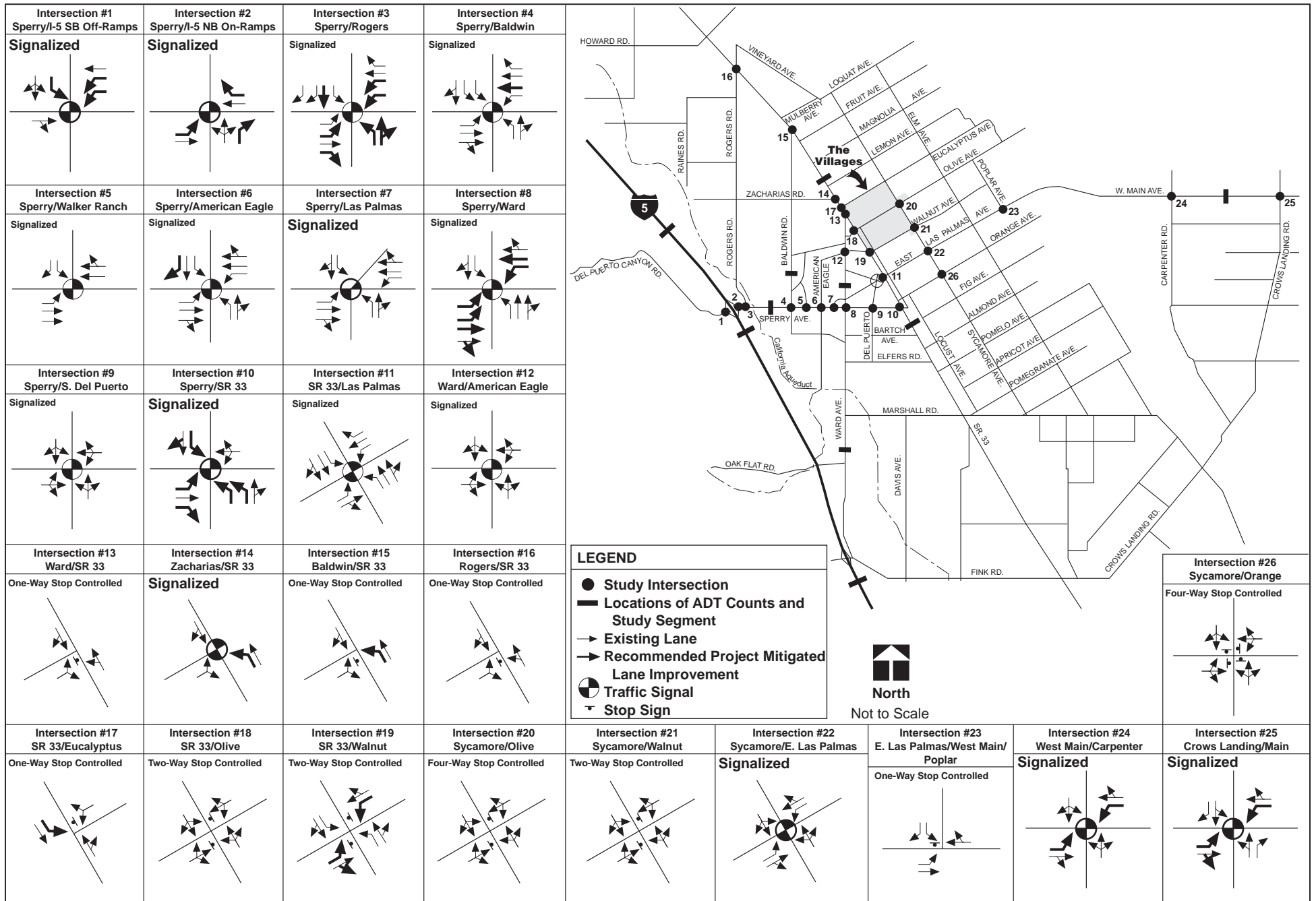
Improvements are due primarily to the projected traffic from the previously approved West Patterson Business Park EIR project in 2003.

4. Sperry Ave/Baldwin Rd

Westbound: add a through lane.



City of Patterson
 The Villages of Patterson Traffic Study
Existing plus Approved Project (EPAP) Peak Hour Turning Movement Volumes



City of Patterson
 The Villages of Patterson Traffic Study
Existing plus Approved Project (EPAP) Lane Geometry

Figure
6



6. Sperry Ave/American Eagle Dr

Southbound: add a right turn lane.

7. Sperry Ave/Las Palmas Ave

Signalize intersection.

8. Sperry Ave/Ward Ave

Eastbound: add two left turn lanes and a through lane; restripe the existing shared through and left turn lane as a shared through and right turn lane. Westbound: add a left turn and a through lane.

10. Sperry Ave/SR 33

Signalize intersection. Eastbound: add a left turn lane and a right turn lane. Northbound: add two left turn lanes. Southbound: add a left turn lane and restripe the shared through and left lane as a shared through and right turn lane.

15. Baldwin Rd./SR 33

Northbound: add a left turn lane.

14. Zacharias Rd/SR 33

Northbound: add a left turn lane due to heavy northbound left-turn volumes of 330 during the a.m. peak hour. Note that a southbound left turn is also warranted at Eucalyptus Road/SR 33.¹

17. SR 33/Eucalyptus Ave

Southbound: add a left turn lane.

19. Walnut Ave/M Street/SR 33

Eastbound: add a left turn lane and restripe shared through and left turn lane as a shared through and right turn lane. Westbound: add a left turn lane and restripe the shared left, through and right turn lane as a shared through and right turn lane.

22. E. Las Palmas Ave/Sycamore Ave

Signalize intersection.

24. Carpenter Rd/W. Main Ave

Signalize intersection. Add eastbound and westbound left turn lanes.

25. Crows Landing Rd/W. Main Ave

Signalize intersection. Eastbound: add a left turn lane; restripe shared through and left turn lane as a shared through and right turn lane. Westbound: add a left turn lane.

¹ Chakroborty P. et al, Transportation Research Record 1500, Lengths of Left Turn Lanes at Unsignalized intersections.

TABLE IV: INTERSECTION LEVELS OF SERVICE – EPAP NO PROJECT CONDITIONS

Intersection	Existing Traffic Control	EPAP Intersection Control (Mitigated)	Existing Conditions				Existing plus Approved Project Conditions							
			A.M.		P.M.		A.M.		A.M. Mitigated		P.M.		P.M. Mitigated	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1. Sperry Ave/I-5 SB Off-Ramps	Unsignalized	Signalized	8.6(11.6)	A (B)	19.0(25.2)	A (D)	>120(>120)	F(F)	6.6	A	>120(>120)	F(F)	20.0	B
2. Sperry Ave/I-5 NB On-Ramps	Unsignalized	Signalized	0.9(10.2)	A (B)	2.3(13.0)	A (B)	>120(>120)	F(F)	9.1	A	15.9(>120)	C(F)	8.6	A
3. Sperry Ave/Rogers Road	Signalized	Signalized	7.0	A	7.9	A	— ³	— ³	21.8	C	— ³	— ³	19.4	B
4. Sperry Ave/Baldwin Rd	Signalized	Signalized	7.9	A	6.3	A	82.1	F	17.3	B	63.7	E	18.6	B
5. Sperry Avenue/Walker Prkwy	Signalized	Signalized	2.6	A	2.2	A	7.2	A	—	—	9.8	A	—	—
6. Sperry Ave/American Eagle Dr	Signalized	Signalized	3.7	A	5.5	A	42.3	D	22.7	C	45.0	D	19.0	B
7. Sperry Ave/Las Palmas Ave	Unsignalized	Signalized	2.6(14.0)	A (B)	3.0 (17.0)	A (C)	>120(>120)	F(F)	7.7	A	>120(>120)	F(F)	12.8	B
8. Sperry Ave/Ward Ave	Signalized	Signalized	8.1	A	8.9	A	>120	F	23.1	C	>120	F	23.8	C
9. Sperry Ave/S Del Puerto Ave	Signalized	Signalized	4.5	A	6.0	A	4.7	A	—	—	5.4	A	—	—
10. Sperry Ave/SR-33	Unsignalized	Signalized	6.1(18.5)	A (C)	14.6 (41.6)	B (E)	>120(>120)	F(F)	12.6	B	>120(>120)	F(F)	11.4	B
11. SR-33/Las Palmas Ave	Signalized	Signalized	11.7	B	11.9	B	10.5	B	—	—	10.1	B	—	—
12. Ward Ave/American Eagle Dr	Signalized	Signalized	8.5	A	5.9	A	6.6	A	—	—	6.0	A	—	—
13. Ward Ave/SR-33	Unsignalized	Unsignalized	3.5(12.3)	A (B)	1.7 (14.3)	A (B)	3.1(13.3)	A(B)	—	—	2.5(13.9)	A(B)	—	—
14. Zacharias Rd/SR-33 ¹	Unsignalized	Signalized	1.2(10.2)	A (B)	0.7 (11.0)	A (B)	5.0(16.9)	A(C)	1.8	A	8.2(16.1)	A(C)	4.5	A
15. Baldwin Rd/SR-33 ¹	Unsignalized	Unsignalized	0.6(10.7)	A (B)	0.9 (14.7)	A (B)	2.2(12.9)	A(B)	2.1(12.9)	A(B)	8.0(16.7)	A(C)	7.9(16.7)	A(C)
16. Rogers Rd/SR-33	Unsignalized	Unsignalized	0.6 (11.9)	A (B)	1.0 (13.5)	A (B)	0.9(16.4)	A(C)	—	—	14.1(49.3)	B(E)	—	—
17. SR-33/Eucalyptus ²	Unsignalized	Unsignalized	0.6(11.8)	A (B)	0.3(12.0)	A (B)	2.7(12.4)	A(B)	2.6(12.4)	A(B)	3.0(21.9)	A(C)	2.3(21.9)	A(C)
18. Olive Avenue/SR-33	Unsignalized	Unsignalized	2.6(11.4)	A (B)	2.6 (17.3)	A (B)	4.0 (12.4)	A(B)	—	—	3.5(13.9)	A(B)	—	—
19. Walnut Avenue/M Street/SR-33	Unsignalized	Unsignalized	9.9(34.5)	A (D)	5.2 (20.6)	A (C)	36.4(70.2)	D(F)	17.1(29.7)	C(D)	59.3(>120)	E(F)	28.2(58.2)	C(F)
20. Olive Ave/Sycamore Ave	Unsignalized	Unsignalized	7.1	A	7.3	A	8.3	A	—	—	8.7	A	—	—
21. Walnut Ave/Sycamore Ave	Unsignalized	Unsignalized	7.0(9.3)	A (A)	8.1 (9.8)	A (A)	5.4(12.0)	A(B)	—	—	3.4(11.1)	A(B)	—	—
22. Las Palmas Avenue/Sycamore Ave	Unsignalized	Signalized	13.4	B	12.4	B	>120	F	5.9	A	>120	F	10.6	B
23. Poplar Ave/Las Palmas Ave	Unsignalized	Unsignalized	0.1(13.6)	A (B)	0.6 (11.4)	A (B)	0.9(24.1)	A(C)	—	—	1.8(49.3)	A(E)	—	—
24. Carpenter Rd/W Main Ave	Unsignalized	Signalized	12.1	B	14.3	B	114.3	F	6.5	A	>120	F	6.4	A
25. Crows Landing Rd/W Main Ave	Unsignalized	Signalized	13.2	B	16.3	C	>120	F	7.8	A	>120	F	6.7	A
26. Sycamore Ave/Orange Ave	Unsignalized	Unsignalized	7.2	A	7.4	A	7.2	A	—	—	7.3	A	—	—

Notes: LOS = Level of Service

X (X) = Intersection level of service (Level of service for the minor approach)

X.X (X.X) = Average Intersection Delay in seconds per vehicle (Average Delay in seconds per vehicle for the minor approach)

Signalized in Bold is a mitigation measure

¹ An exclusive northbound left turn lane is warranted

² An exclusive southbound left turn is recommended

³ Existing configurations not applicable since additional lane configuration required for future development to the south of the intersection

Table V shows the roadway segment level of service analysis in this scenario. Based on the existing roadway lane configuration, all study segments are expected to operate acceptably at LOS D or better in this scenario.

TABLE V: ROADWAY SEGMENT LEVELS OF SERVICE – EPAP CONDITIONS

No.	Freeway / Roadway Segment	Direction	Dir. Lanes	Capacity	Existing Conditions						EPAP Conditions					
					A.M. Peak Hour			P.M. Peak Hour			A.M. Peak Hour			P.M. Peak Hour		
					Volume (Veh.)	Speed (mph)	LOS	Volume (Veh.)	Speed (mph)	LOS	Volume (Veh.)	Speed (mph)	LOS	Volume (Veh.)	Speed (mph)	LOS
1	I-5, n/o Sperry Ave. ¹	NB	2	4,600	2,050	-	B	2,487	-	C	2,074	-	B	2,581	-	C
		SB	2	4,600	2,600	-	C	2,086	-	B	2,631	-	C	2,245	-	B
2	I-5, s/o Sperry Ave. ¹	NB	2	4,600	1,719	-	B	2,181	-	B	2,566	-	C	1,926	-	B
		SB	2	4,600	2,086	-	B	1,814	-	B	1,763	-	B	2,366	-	B
3	I-5, s/o Fink Rd. ¹	NB	2	4,600	2,204	-	B	2,674	-	C	1,863	-	B	1,687	-	B
		SB	2	4,600	2,796	-	C	2,326	-	B	1,686	-	B	1,800	-	B
4	Sperry Ave. ² e/o Rogers Rd.	EB	2	2,280	255	26.5	C	535	27	C	1,096	25.5	C	794	26	B
		WB	2	2,280	445	26	C	279	26.5	C	453	26.5	C	1,046	25.5	B
5	Baldwin Rd, n/o Sperry Ave. ²	EB	1	890	93	19.5	C	104	19.5	C	477	17.5	D	212	19	B
		WB	1	890	135	19	C	105	19.5	C	245	19	C	350	18	B
6	SR-33, n/o Zacharias Rd. ²	NB	1	1,140	178	31	C	254	30.5	C	77	31	C	365	29.5	C
		SB	1	1,140	234	30.5	C	359	29.5	C	465	29	C	244	30.5	C
7	SR-33, s/o Sperry Ave. ²	NB	1	1,140	303	30	C	239	30.5	C	846	25.5	C	520	29	C
		SB	1	1,140	224	30.5	C	342	30	C	213	30.5	C	760	26	D
8	Ward Ave., n/o Las Palmas Ave. ²	NB	1	1,140	361	26	C	159	26.5	C	285	26	C	563	25	C
		SB	1	1,140	338	26	C	185	26.5	C	584	25	C	547	25	C
9	Ward Ave., s/o Marshall Rd. ²	NB	1	1,140	139	26.5	C	127	26.5	C	128	26.5	C	352	26	C
		SB	1	1,140	144	26.5	C	114	26.5	C	286	26	C	76	27	C
10	E. Las Palmas Ave., e/o Sycamore Ave. ²	EB	1	1,140	343	26	C	312	26	C	77	27	C	297	26	C
		WB	1	1,140	337	26	C	317	26	C	416	26	C	211	26.5	C
11	Main St., e/o Carpenter Rd. ²	EB	1	1,140	222	27	C	321	26	C	175	26.5	C	752	24	C
		WB	1	1,140	236	27	C	239	26.5	C	695	24	C	490	25.5	C

Notes: ¹Highway Capacity Manual 2000 – Basic Freeway Segments Analysis; LOS based on density, not speed.

²Highway Capacity Manual 2000 – Urban Streets Analysis.

LOS I - Mitigated LOS based on four lanes Sperry Avenue

Based on the model results, it is estimated that a three lane roadway segment (with two-way left-turn lanes) would be acceptable on Baldwin Road (between Sperry Avenue and Zacharias Road) and on Zacharias Road (between SR 33 and Baldwin Road).

The current lanes on Sperry Avenue would be able to accommodate the projected traffic. However, signalization and modification at the I-5/Sperry Avenue on-/off ramps would be required.

EPAP PLUS PROPOSED PROJECT CONDITIONS

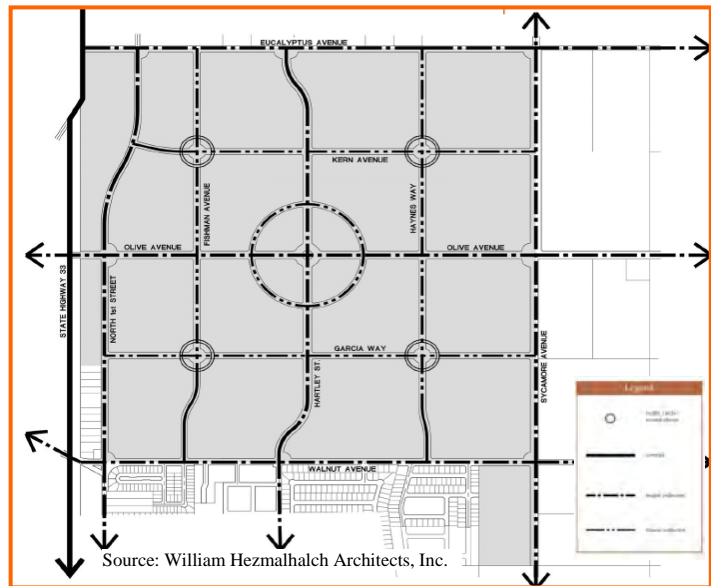
Methodology

This scenario adds traffic from the proposed Villages of Patterson to the EPAP conditions. Turning movement volumes at the study intersections and link volumes on the study segments were obtained from the StanCOG model.

Proposed Project Land Use

The proposed Villages of Patterson will be a new residential and mixed-use village community with approximately 852 Low Density Residential dwelling units, 1,709 Medium Density Residential dwelling units, 232 High Density Residential dwelling units and 307 mix of multi-family residential including live-work dwelling units at the Village Circle for a total of 3,100 dwelling units.

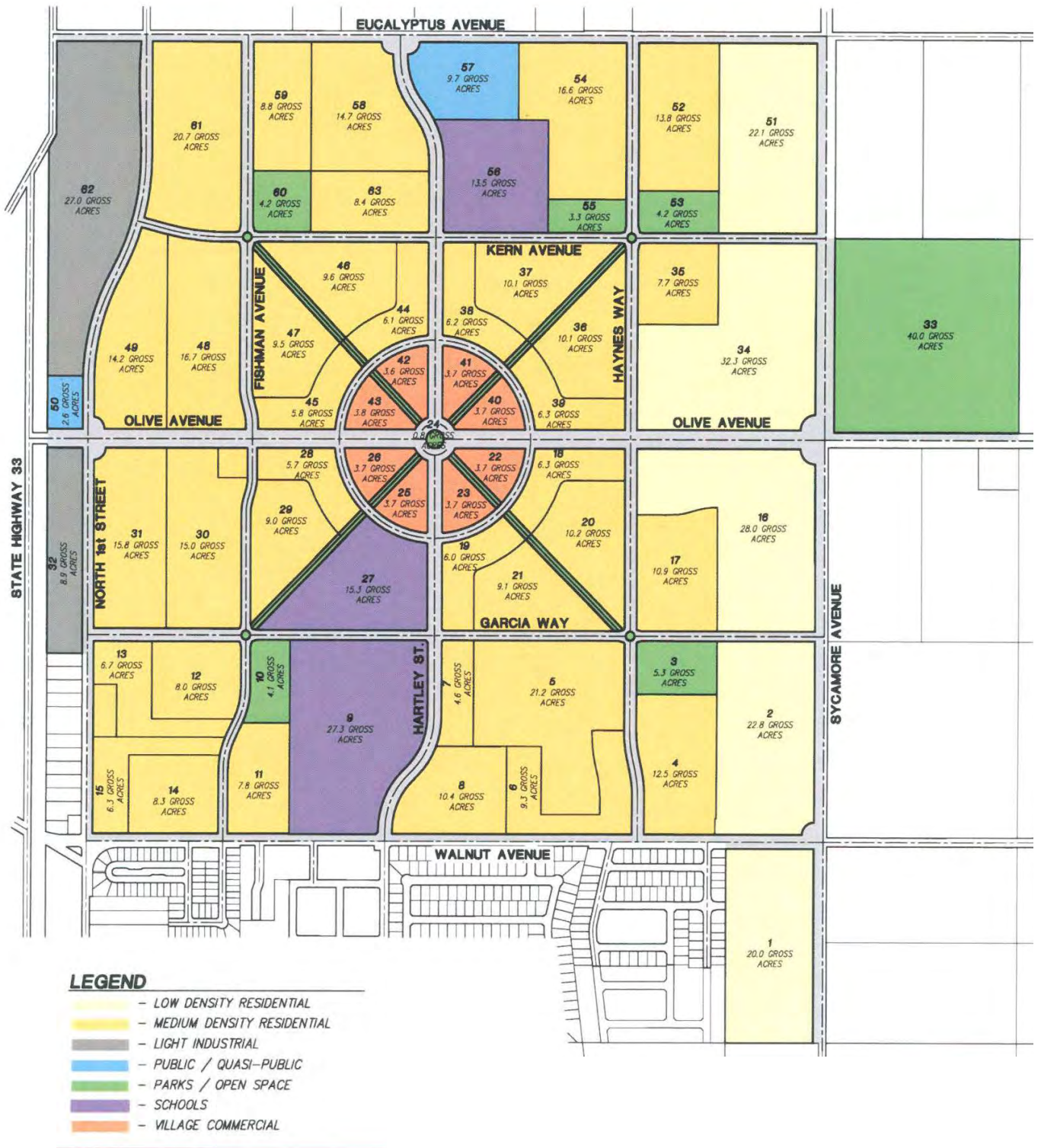
In addition, the proposed Project consists of approximately 623,800 square feet of Light Industrial development, approximately 433,400 square feet of Public/Quasi-Public uses and up to approximately 100,000 square feet total including office, retail, civic uses and home-based business at the Village Circle.



At the Village Circle, it will include a mix of multi-unit residential allowing for live-work and commercial use including small office, café, neighborhood retail and home-based business. The proposed Master Plan land use plan is shown in Figure 7.

The low density residential is generally located on the eastern boundary of the project area. The medium density units are located more towards the central portion of the project.

The Light Industrial (LI) land use is located at the westernmost portion of the Plan Area, adjacent to the SPR railroad right-of-way. The LI designation would allow for light manufacturing, warehouse, commercial or office use. Due to the narrow site constraints, it is anticipated that these would primarily be more suitable for small light industrial uses. The Public/Quasi-Public uses would allow for public uses including fire and police stations, community centers, libraries and places of worship. Three school sites totaling 59 acres have been shown on the plan. The Patterson Unified School District would construct the first of these schools at Hartley Street and Garcia Way.



Source: William Hezmalhalch Architects, Inc.

City of Patterson
 The Villages of Patterson Traffic Study
Proposed Master Plan Land Use

Figure
7



Proposed Circulation

The proposed project circulation consists of four major collector streets that frame the project boundary. Walnut Street is located to the south, Eucalyptus Street to the north, North First Street to the west and Sycamore Avenue to the east. Two additional major collector streets (Olive Avenue runs east-west and Hartley Street runs north-south) bisect the project area almost equally into four equal quadrant areas. A central roundabout at the intersection of Hartley Street and Olive Avenue will provide both focus as well as traffic calming function.

The proposed Sherman Circle will define the Village Circle core area. Its ring layout mirrors that of the existing downtown area.

A network of interior residential streets and alleys will provide access to the local subdivisions and neighborhoods.

Trip Generation

Trip Generation is defined as the number of “vehicle trips” produced by a particular land use or project. Trip generation for the study area is based on the StanCOG Travel Demand Model. Based on the StanCOG model the proposed project traffic was assigned to the roadway network.

Trips from outside zones to the proposed project zones were computed as *inbound* trips and the converse as *outbound* trips. It is estimated that the project will generate approximately 2,652 trips during the a.m. peak hour and 3,338 trips during the p.m. peak hour. The result of the trip distribution is shown on Figure 7a.

TABLE VI: PROPOSED VILLAGES OF PATTERSON TRIP GENERATION

Land Use	Size	Units	A.M. Peak Hour			P.M. Peak Hour		
			IN	OUT	Total	IN	OUT	Total
Low/Medium DU	2,561	DU	77	1,306	1,383	922	1,050	1,972
High Density DU	232	DU	7	93	100	65	58	123
Village Circle	307	DU	9	123	132	86	77	163
	100,000	SF						
Light Industrial	623,800	SF	418	62	480	143	374	518
Public/Quasi-Public	433,400	SF	390	100	490	251	295	546
School	58.6	Ac	60	7	67	2	15	16
Total			961	1,691	2,652	1,469	1,868	3,338

As mentioned earlier, at the Village Circle, there will be a mix of multi-unit residential allowing for live-work and commercial use including small office, neighborhood retail and home-based business. The commercial area is designed to be pedestrian oriented and provides convenient services to the community, so conventional “strip mall” design that is car-oriented will not be permitted. Appropriate commercial uses will include small retail shops, offices, café and restaurants common in traditional towns and pedestrian-oriented environments. It is estimated that there will be less trips generated per dwelling units due to reduced journey to work/from work as well as some link and pass-by trips to the neighborhood oriented commercial area. The commercial areas are designed to promote walk and bike mode of travel.



City of Patterson
 The Villages of Patterson Traffic Study
Project Trip Distribution (2030 plus Project)

Level of Service Analysis

Figure 8 shows the EPAP plus Project peak hour turning movement volumes. Figure 9 shows the EPAP plus Project lane geometry. With the identified mitigations, all study intersections are expected to operate acceptably in this scenario. Table VII shows the results of the intersection level of service in this scenario. Detailed calculations are shown in Appendix E.

Based on the results of the projected traffic at the buildout of approved and proposed project trips, intersections that require mitigation measures in this scenario are described below:

1. Sperry Ave/I-5 SB Off Ramps

Signalize intersection. Southbound: add left turn lane. Westbound: add two left turn lanes.

2. Sperry Ave/I-5 NB On-Ramps

Signalize intersection. Eastbound: add left turn lane. Westbound: add a right turn lane. Northbound: add right turn lane.

3. Sperry Ave/Rogers Rd

Eastbound: add a left turn lane and a right turn lane. Westbound: add two left turn lanes. Northbound: add a left turn lane and a shared through and right turn lane. Southbound: add a through lane.

Intersection improvements are due primarily to the projected traffic from the previously approved West Patterson Business Park EIR project in 2003.

4. Sperry Ave/Baldwin Rd

Westbound: add a through lane.

6. Sperry Ave/American Eagle Dr

Southbound: add a right turn lane.

7. Sperry Ave/Las Palmas Ave

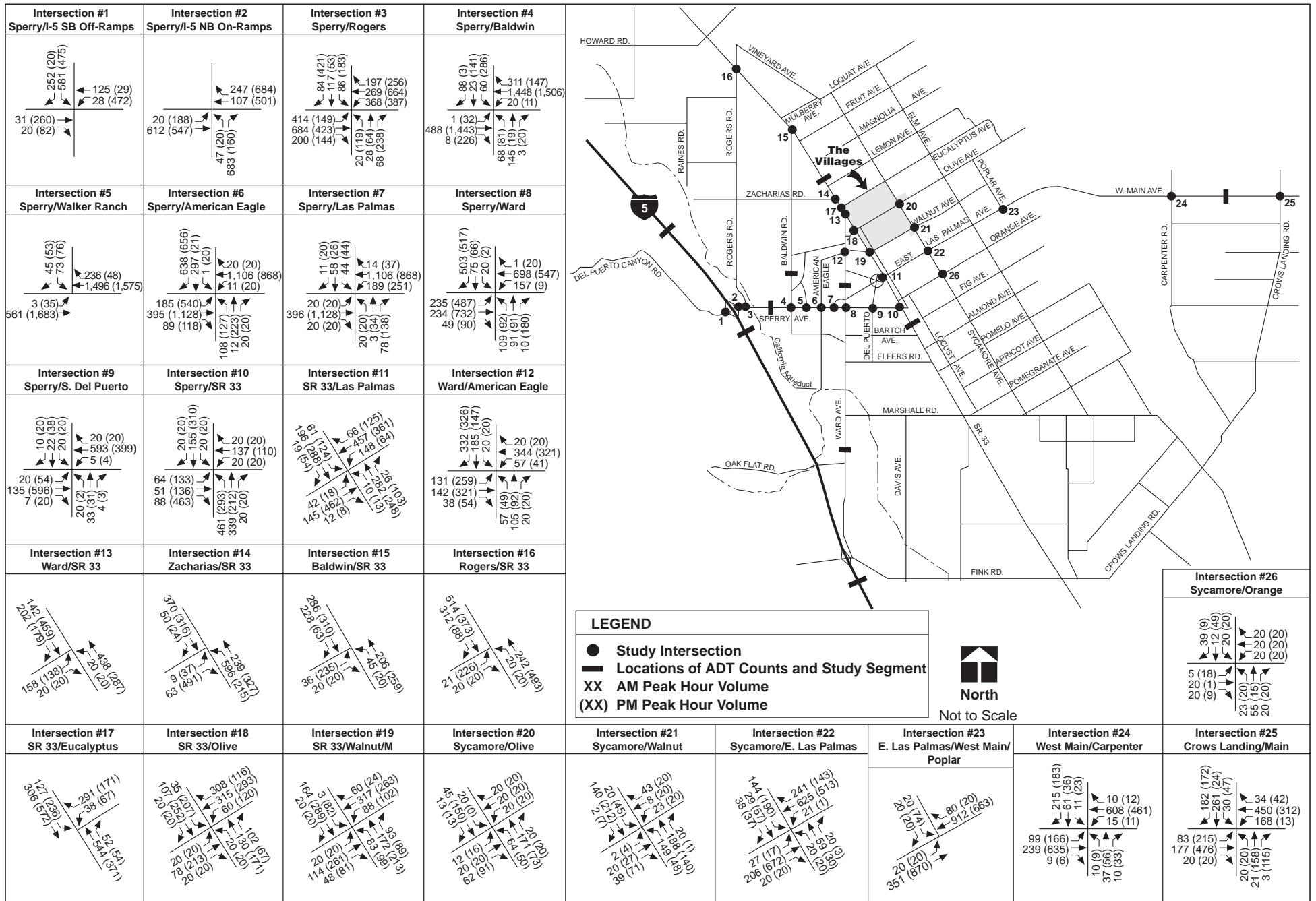
Signalize intersection.

8. Sperry Ave/Ward Ave

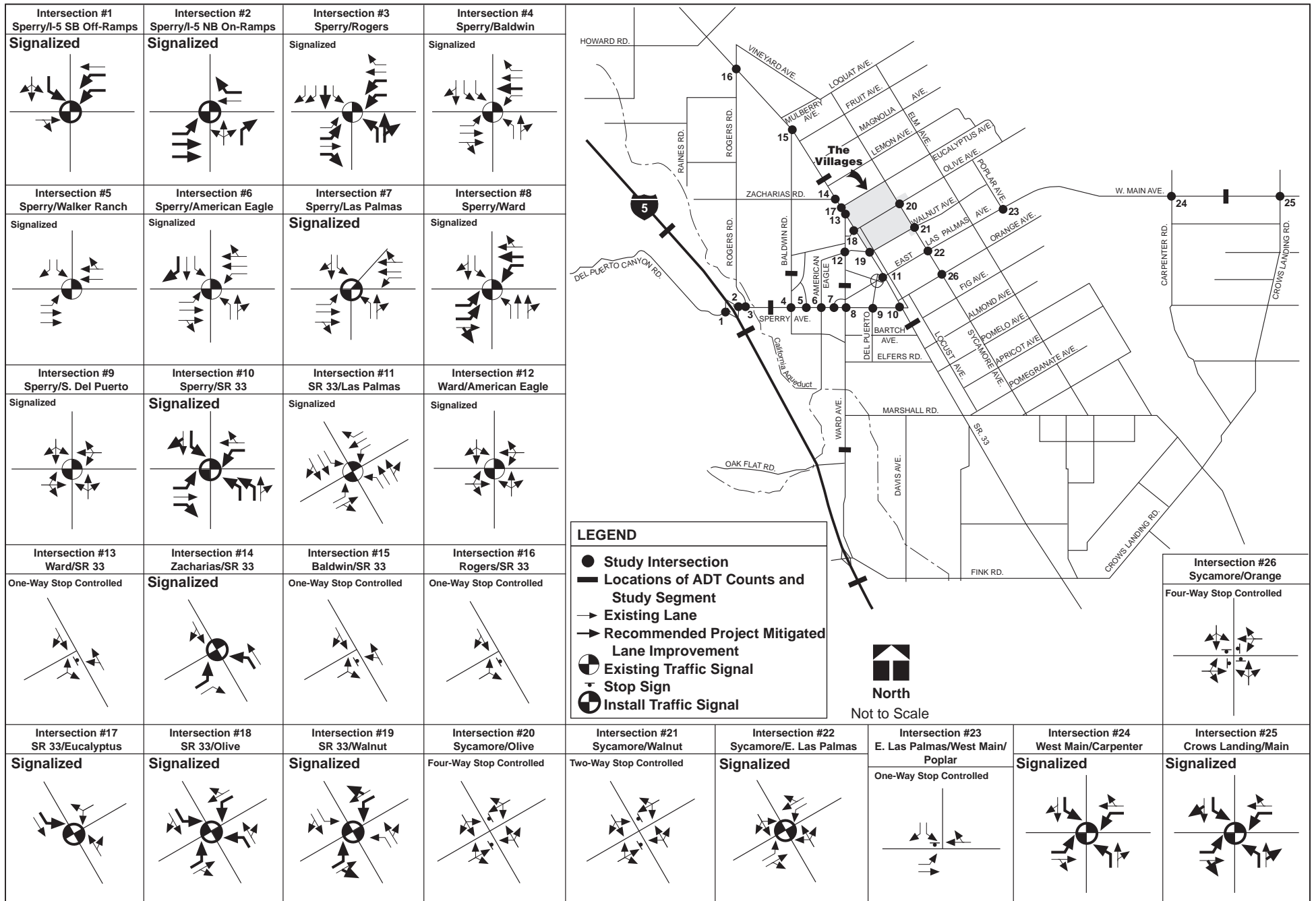
Eastbound: add two left turn lanes; restripe the existing shared through and left turn lane as a shared through and right turn lane. Westbound: add a left turn lane and a through lane.

10. Sperry Avenue/SR 33

Signalize intersection. Eastbound: add a left turn lane. Westbound: add a left turn lane. Northbound: add two left turn lanes. Southbound: add a left turn lane and restripe the shared through and left lane as a shared through and right turn lane.



City of Patterson
The Villages of Patterson Traffic Study
Existing plus Approve (EPAP) + Project Peak Hour Turning Movement Volumes



City of Patterson
 The Villages of Patterson Traffic Study
Existing plus Approved (EPAP) + Project Lane Geometry

14. Zacharias Rd/SR 33

Northbound: add a left turn lane due to heavy northbound left-turn volumes of 596 during the a.m. peak hour. Eastbound: add a left turn lane.

Due to projected volume of nearly 850 vehicles during the a.m. peak hour in the northbound approach, it is estimated that a four-lane segment on SR 33 (between Zacharias Road and Ward Avenue) would be required at approximately 92 percent buildout of the project or when conditions warrant.

17. SR 33/Eucalyptus Ave

Signalize intersection. Southbound: add a left turn and through lane. Northbound: add a through lane.

18. Olive Ave/SR 33

Signalize intersection. Add a left turn lane in the eastbound, westbound, northbound and southbound approaches.

19. Walnut Ave/M Street/SR 33

Signalize intersection. Eastbound, Westbound: add a left turn lane and restripe shared through and left turn lane as a shared through and right turn lane.

22. E. Las Palmas Ave/Sycamore Ave

Signalize intersection.

24. West Main Ave/Carpenter Rd

Signalize intersection. Add a left turn lane in the eastbound, westbound, northbound and southbound approaches.

25. Crows Landing Rd/W. Main Ave

Signalize intersection. Eastbound, Northbound and Southbound: add a left turn lane and restripe the through and left turn lane as a shared through and right turn lane. Westbound: add a left turn lane.

Suggested Intersection Re-alignment

The model results showed that a significant amount of traffic from the proposed project as well as future traffic would be using Zacharias Road to access the projected employment opportunities available at the future West Patterson Business Park. It is estimated that nearly 600 trips will be making the northbound left-turn from SR 33 to proceed westbound onto Zacharias Road during the a.m. peak hour. Therefore a northbound left-turn lane would be required at the intersection of SR 33/Zacharias Road.

The three intersections of Zacharias Road, Eucalyptus Avenue and Ward Avenue along SR 33 are located at approximately 800 feet from each other. To provide for better signal progression as well as good access management within this short distance, it is recommended that the intersections of Zacharias Road/SR 33 and Eucalyptus Avenue/SR 33 be combined into a single intersection as shown on the figure to the right.

In addition, it is recommended that the intersection of Ward Avenue at SR 33 should be realigned so that it T's into SR 33 at a right angle.

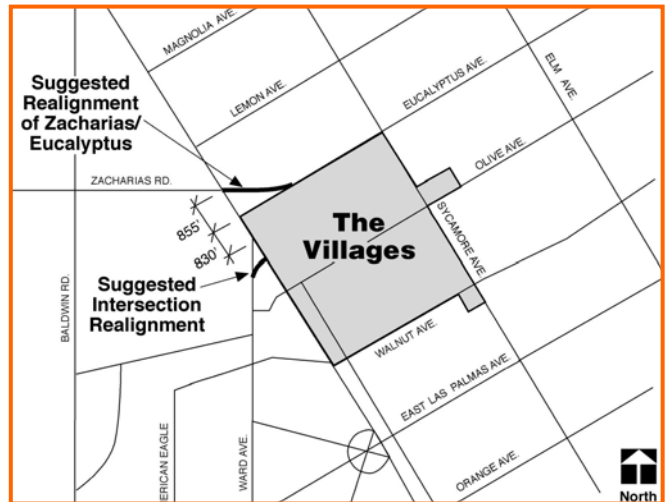


TABLE VII: INTERSECTION LEVELS OF SERVICE: EPAP PLUS PROJECT CONDITIONS

Intersection	Existing Traffic Control	EPAP + Project Intersection Control (Mitigated)	Existing Condition				Existing plus Approved plus Project Condition							
			A.M.		P.M.		A.M.		A.M. Mitigated		P.M.		P.M. Mitigated	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1. Sperry Ave/I-5 SB Off-Ramps	Unsignalized	Signalized	8.6(11.6)	A (B)	19.0(25.2)	A (D)	102.1(>120)	F(F)	12.1	B	>120(>120)	F(F)	16.0	B
2. Sperry Ave/I-5 NB On-Ramps	Unsignalized	Signalized	0.9(10.2)	A (B)	2.3(13.0)	A (B)	>120(>120)	F(F)	7.7	A	12.9(105.0)	B(F)	1.1	A
3. Sperry Ave/Rogers Road	Signalized	Signalized	7.0	A	7.9	A	— ³	—	19.5	B	— ³	—	19.1	B
4. Sperry Ave/Baldwin Rd	Signalized	Signalized	7.9	A	6.3	A	61.1	E	13.8	B	76.6	E	25.1	B
5. Sperry Avenue/Walker Parkway	Signalized	Signalized	2.6	A	2.2	A	7.3	A	—	—	7.3	A	—	—
6. Sperry Ave/American Eagle Dr	Signalized	Signalized	3.7	A	5.5	A	83.7	F	34.4	C	44.5	D	26.0	C
7. Sperry Ave/Las Palmas Ave	Unsignalized	Signalized	2.6(14.0)	A (B)	3.0 (17.0)	A (C)	>120(>120)	F(F)	4.2	A	>120(>120)	F(F)	10.6	B
8. Sperry Ave/Ward Ave	Signalized	Signalized	8.1	A	8.9	A	100.8	F	13.9	B	>120	F	18.0	B
9. Sperry Ave/S Del Puerto Ave	Signalized	Signalized	4.5	A	6.0	A	4.0	A	—	—	4.5	A	—	—
10. Sperry Ave/SR-33	Unsignalized	Signalized	6.1(18.5)	A (C)	14.6(41.6)	B (E)	>120(>120)	F(F)	12.1	B	>120(>120)	F(F)	11.8	B
11. SR-33/Las Palmas Ave	Signalized	Signalized	11.7	B	11.9	B	11.1	B	—	—	12.2	B	—	—
12. Ward Ave/ American Eagle Dr	Signalized	Signalized	8.5	A	5.9	A	9.6	A	—	—	21.6	C	—	—
13. Ward Ave/SR-33	Unsignalized	Unsignalized	3.5(12.3)	A (B)	1.7 (14.3)	A (B)	4.7(24.5)	A(C)	—	—	5.0(33.1)	A(D)	—	—
14. Zacharias Rd/SR-33 ¹	Unsignalized	Signalized	1.2(10.2)	A (B)	0.7 (11.0)	A (B)	10.0(45.4)	A(E)	19.7	B	28.9(72.1)	C(F)	9.1	A
15. Baldwin Rd/SR-33	Unsignalized	Unsignalized	0.6(10.7)	A (B)	0.9 (14.7)	A (B)	1.6(15.1)	A(C)	—	—	8.8(30.5)	A(D)	—	—
16. Rogers Rd/SR-33	Unsignalized	Unsignalized	0.6 (11.9)	A (B)	1.0 (13.5)	A (B)	0.9(18.7)	A(C)	—	—	21.1(103.6)	C(F)	—	—
17. SR-33/Eucalyptus Ave ²	Unsignalized	Signalized	0.6(11.8)	A (B)	0.3(12.0)	A (B)	15.2(57.4)	C(F)	6.0	A	24.0(>120)	C(F)	4.9	A
18. Olive Avenue/SR-33	Unsignalized	Signalized	2.6(11.4)	A (B)	2.6 (17.3)	A (B)	114.2(>120)	F(F)	7.7	A	>120(>120)	F(F)	8.0	A
19. Walnut Avenue/M Street/SR-33	Unsignalized	Signalized	9.9(34.5)	A (D)	5.2 (20.6)	A (C)	>120(>120)	F(F)	6.9	A	>120(>120)	F(F)	7.5	A
20. Olive Ave/Sycamore Ave	Unsignalized	Unsignalized	7.1	A	7.3	A	8.9	A	—	—	8.5	A	—	—
21. Walnut Ave/Sycamore Ave	Unsignalized	Unsignalized	7.0(9.3)	A (A)	8.1 (9.8)	A (A)	5.3(15.2)	A(C)	—	—	4.9(15.1)	A(C)	—	—
22. Las Palmas Avenue/Sycamore Ave	Unsignalized	Signalized	13.4	B	12.4	B	>120	F	12.5	B	>120	F	11.9	B
23. Poplar Ave/Las Palmas Ave	Unsignalized	Unsignalized	0.1(13.6)	A (B)	0.6 (11.4)	A (B)	1.0(30.4)	A(D)	—	—	6.1(106.1)	A(F)	—	—
24. Carpenter Rd/W Main Ave	Unsignalized	Signalized	12.1	B	14.3	B	87.6(>120)	F(F)	6.8	A	>120(>120)	F(F)	6.1	A
25. Crows Landing Rd/W Main Ave	Unsignalized	Signalized	13.2	B	16.3	C	109.7	F	9.3	A	>120(>120)	F(F)	7.1	A
26. Sycamore Ave./Orange Ave.	Unsignalized	Unsignalized	7.2	A	7.4	A	7.5	A	—	—	7.5	A	—	—

Notes: LOS = Level of Service
X = Intersection level of service
X.X = Overall intersection delay in seconds per vehicle
 Delay = Average stopped delay at signalized intersections and average delay for all movements at STOP-controlled intersections.
 Mitigated lane configurations are shown in Figure 7. Same mitigation measures assumed for both AM and PM peak hours as appropriate
Signalized in Bold is a mitigation measure
¹ An exclusive northbound left turn lane is warranted
² An exclusive southbound left turn is recommended
³ Existing configurations not applicable since additional lane configuration required for future development to the south of the intersection

Table VIII summarizes the results of the roadway segment level of service analysis. All study roadway segments are expected to operate acceptably with the existing lane configurations in this scenario.

TABLE VIII: ROADWAY SEGMENT LEVELS OF SERVICE – EPAP PLUS PROJECT CONDITIONS

No.	Freeway / Roadway Segment	Direction	Dir. Lanes	Capacity	A.M. Peak Hour			P.M. Peak Hour		
					Volume (Veh.)	Speed (mph)	LOS	Volume (Veh.)	Speed (mph)	LOS
1.	I-5, n/o Sperry Ave. ¹	NB	2	4,600	2,114	-	B	2,604	-	C
		SB	2	4,600	2,600	-	C	2,257	-	B
2.	I-5, s/o Sperry Ave. ¹	NB	2	4,600	2,516	-	B	1,895	-	B
		SB	2	4,600	1,734	-	B	2,331	-	B
3.	I-5, s/o Fink Rd. ¹	NB	2	4,600	1,857	-	B	1,685	-	B
		SB	2	4,600	1,700	-	B	1,800	-	B
4.	Sperry Ave. ² e/o Rogers Rd.	EB	2	2,280	1,025	25.5	C	786	26.0	C
		WB	2	2,280	494	26.5	C	1,049	25.5	C
5.	Baldwin Rd, n/o Sperry Ave. ²	EB	1	890	455	17.5	D	302	29.5	B
		WB	1	890	256	19.0	C	460	28.5	B
6.	SR-33, n/o Zacharias Rd. ²	NB	1	1,140	221	30.5	C	477	29.0	C
		SB	1	1,140	537	29.0	C	358	29.5	C
7.	SR-33, s/o Sperry Ave. ²	NB	1	1,140	800	25.5	D	471	29.0	C
		SB	1	1,140	254	30.5	C	760	26.0	D
8.	Ward Ave., n/o Las Palmas Ave. ²	NB	1	1,140	197	26.5	C	512	25.0	C
		SB	1	1,140	271	26.0	C	580	25.0	C
9.	Ward Ave., s/o Marshall Rd. ²	NB	1	1,140	292	26.5	C	333	26.5	C
		SB	1	1,140	89	26.0	C	159	26.5	C
10.	E. Las Palmas Ave., e/o Sycamore Ave. ²	EB	1	1,140	174	26.0	C	400	26.0	C
		WB	1	1,140	458	25.5	C	327	26.5	C
11.	Main St., e/o Carpenter Rd. ²	EB	1	1,140	241	25.5	C	704	24.5	C
		WB	1	1,140	665	24.0	C	454	25.5	C

Notes: ¹Highway Capacity Manual 2000 – Basic Freeway Segments Analysis; LOS based on density, not speed.

²Highway Capacity Manual 2000 – Urban Streets Analysis.

LOS (C) - Mitigated LOS based on four lane Sperry Avenue

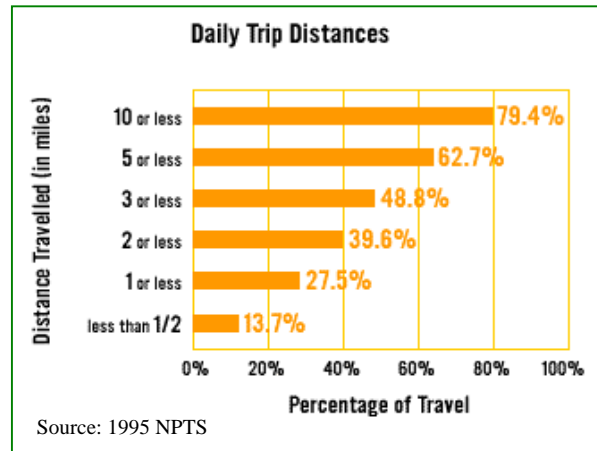
NON-AUTO MODES OF TRAVEL

The current traffic model does not account for any trip reductions from non-auto modes of travel. It is anticipated that many future residents and workers of Villages of Patterson will be using other modes of travel including walking, biking, transit or carpool.

Many of the trips that people make every day are short enough to be accomplished on a bicycle or on foot. The 1995 National Personal Transportation Survey (NPTS) found that approximately 40 percent of all trips are less than two miles in length – which represents a 10-minute bike ride or a 30-minute walk. A 1995 Rodale Press survey found that people *want* the opportunity to walk or bike instead of drive: 40 percent of U.S. adults say they would commute by bike if safe facilities were available.

Bicycle and Walk Plan

Bicycling and walking can help to reduce roadway congestion. Many streets and highways carry more traffic than they were designed to handle, resulting in gridlock, wasted time and energy, pollution, and driver frustration.



Sidewalks are proposed on all residential streets.

In addition, direct pedestrian access connections will be provided at strategic locations. For example, most of the cul-de-sacs will be designed with pedestrian access at the end points. These pedestrian access points will promote a walkable environment by providing a more direct connection to major streets and collectors.

School Access

One of the very attractive designs of Villages of Patterson for families with school age children is that the development will provide most of its own schools specifically both elementary and middle schools. In addition, all the schools have been strategically located and will be bike and pedestrian accessible. It is planned for all the schools in Villages of Patterson to be designed so that children can walk to school, it is expected that a large percentage of students might actually walk to school as opposed to be dropped-off – especially children older than fourth graders.

To ensure that more students actually feel safe walking or biking to school, it is imperative that the future school and parent groups (such as PTA) work closely to design a recommended route to school. The recommended route to school guidelines usually consist of a pamphlet (with recommended routes being mapped out) and safety suggestions for parents and children. The recommended access to every school is different so separate maps should be prepared for each school.

Even though the recommended access routes to each school are unique, the following attributes should be considered for design of roadways near each school:

- To improve mobility and reduce exposure for pedestrians and bicyclists: include curb extensions, chokers, pedestrian crossing islands and raised intersections where feasible. Also include countdown or audible signals at pedestrian crossings.

- To reduce speeds of vehicles: include raised intersections, modern roundabouts and paving treatment at strategic locations where feasible.
- To improve sight distance and visibility for vehicles, pedestrians and bicyclists: include paving treatments, high visibility SCHOOL and XING signs, advanced stop lines, LED pedestrian signals and lighted crosswalks as appropriate.

Transportation Demand Management (TDM)

Transportation Demand Management (TDM, also known as *Mobility Management*) is a general term for various strategies that increase transportation system efficiency. TDM treats mobility as a means to an end, rather than an end in itself, and so helps individuals and communities meet their transport needs in the most efficient way, which often reduces total vehicle traffic. TDM prioritizes travel based on the value and costs of each trip, giving higher value trips and lower cost modes priority over lower value, higher cost travel, when doing so increases overall system efficiency. For example, a higher value trip would be bicycling to work while a lower value trip would be driving alone to work. It emphasizes the movement of people and goods, rather than motor vehicles, and so gives priority to public transit, ridesharing and non-motorized travel, particularly under congested urban conditions.

There are many different TDM strategies with a variety of transportation impacts. Some improve the transportation options available to consumers. Some cause changes in trip scheduling, route, destination or mode. Others reduce the need for physical travel through more efficient land use, or transportation substitutes. TDM is an increasingly common response to transportation problems. Although most individual TDM strategies only affect a small portion of total travel, the cumulative impacts of a comprehensive TDM program can be significant. The specific TDM measures that the Villages of Patterson might consider are summarized below.

<i>Potential Villages of Patterson TDM Measures</i>	
<i>TDM Measures</i>	<i>Action Items and Trigger Points</i>
TDM Plan	Develop an approved TDM Plan prior to the occupancy of the 50 th home.
Annual TDM Meeting	First meeting to be held when a minimum of 1,000 residents and /or 500 employees are in place.
Community telecenter	When 2,000 homes are occupied.
Bicycle storage	One bicycle storage space for every 15 car parking spaces or meet current or future City requirements.
Add shower and clothing locker facilities	For all developments with 50,000 net rentable square feet or larger.
Bus stops	Located every one-quarter to one-half mile depending on the land use density, the best location for the land use they are serving, etc.
Joint-use park-n-ride lots	To be provided near the village center.

Transit Service

The Stanislaus Regional Transit, the regional mobility manager for Stanislaus County, provides public transit services in several cities in the county including Patterson, Modesto, Turlock, Oakdale, Newman and Gustine, and provides intercity and rural transit services. The Stanislaus Regional Transit Route 45 provides bus services from Patterson to Turlock, Newman and Gustine

Railroad

To the west of the project site is the railroad tracks that run north-south and adjacent to the proposed light industrial site. The railroad tracks are located between the proposed light industrial land use and SR 33. Currently, there is a train a day that uses the tracks.

In the vicinity of the proposed project, at grade crossings of the railroad tracks occur at M Street / Walnut Avenue and Olive Avenue. With the proposed project, it is projected that there will be more vehicles crossing the railroad tracks. For safety purposes, railroad crossing arms should be installed at the track crossings.

Well-designed Healthy Streets

Nationally, there is a general movement towards narrower street design. Research has shown that streets have been designed to be too wide in the past for several reasons: i) most streets have been designed only to move autos as quickly as possible, without any considerations of other uses or modes of travel, ii) most planning and public works agencies have adopted standards from other agencies without due considerations for local conditions and iii) most agencies are reluctant to use street standards narrower than those published by American ASSHTO for fear of lawsuits. However, it should be recognized that ASSHTO was adopted primarily for design of highways, not city streets.

The latest research has generally concluded that a narrower street width is considered to be a better design in that it will ensure slower travel speeds and promote pedestrian safety and generally more walkable communities. The research and findings supporting these generally narrower street width designs are documented in the recently published (January 1999) “*Street Design Guidelines for Healthy Neighborhoods*” authored by Dan Burden and published by the Local Government Commission, Center for Livable Communities.

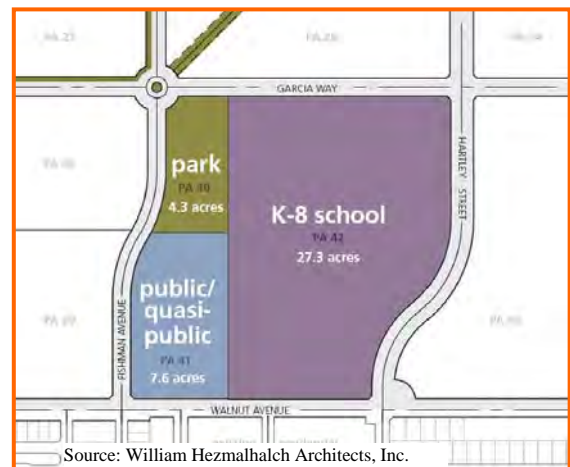
Unless designed with livability in mind, streets in modern subdivisions will continue to bring complaints from residents unhappy with speeding motorists. The tricks or tools used by traffic engineers in the traffic calming toolbox range from speed humps and speed tables to chicanes, bumpouts, circles and roundabouts. However, to avoid costly retrofits for streets that have been designed with no consideration for livability, development should be designed with streets that are walkable, bikable and fully calmed.

Long straight streets generally encourage speeding. The traffic calming program of several Bay Area agencies calls for speed humps a minimum of 600 feet apart. With 600 feet as the goal for a maximum sight distance, the desired street curve radius is approximately 350 feet. Although a smaller radius would reduce speeds even further, it is believed that developers had more difficulty designing their subdivisions with lower radii. The 350 foot goal seems to be an acceptable compromise between speed control and ease of design. Intermediate tangent roadway sections of less than 600 feet appear to provide the needed results.

The proposed project will incorporate some of the good street design functions as discussed above. As mentioned previously, the proposed project includes locating four roundabouts at the four quadrants of the project as well as a central roundabout at the intersection of Hartley Street and Olive Avenue which will provide both focus as well as traffic calming function. In addition, interior curb-to-curb street width with curbside parking will also be narrower at 32 feet.

School Access and Issues

The project includes the development of three elementary schools. The Villages of Patterson development plan stresses design guidelines that require an extensive network of pedestrian and bicycle facilities. Recent studies have shown that excessive speeds occurred predominantly at schools with faster approach speed limits, while slower approach speed limits were associated with better speed compliance. Therefore it is recommended that new school construction on roads with higher speed limits should be discouraged. And, school-zone speed limit signs



with flashing lights were effective in slowing vehicles. Over the past few years, many jurisdictions have constructed in-pavement crosswalk warning systems. The California Traffic Control Devices Committee has evaluated their effectiveness and has recommended adoption for wider use.

For all the schools, some of the most critical issues relate to the peak 15-30 minute student drop-off and bus access during the morning drop-off and afternoon pick-up hours. Generally, inadequate curbside parking or inappropriate access driveway designs on major collector streets cause most of the problems. Therefore, the design for each of the schools should incorporate adequate areas for student drop-off and internal bus turnaround (as necessary) to address these potential issues.

Other means to reduce traffic impacts near schools could be achieved through the implementation of the following measures:

Corner Radii. Street corner radii shall be as small as possible to minimize pedestrian crossing distances (maximum curve radii of 20 to 30 feet for arterials and collectors, and 10 to 20 feet for local streets). Arterial intersections that are anticipated to experience consistent high volumes of truck traffic may utilize curb radii of up to 60 feet, subject to review and approval by the City. Bulb or bumpout corner radii may be used where it can be determined that safety will not be impaired. Radii less than 20 to 25 feet should not be used for street corners at intersections that are (or may be) part of a transit route or school bus route.

Speed Limits. Speed limits shall be established on individual arterial and collector streets. Special speed zones shall be identified as dictated by sensitive land uses such as schools, hospitals, or other institutional uses.

Sidewalks. Sidewalks shall be a minimum of four feet in width along local residential streets and at a minimum of five feet in width along collector streets. Sidewalks shall be constructed at the same time as street connections between residential areas and schools and parks. To facilitate pedestrian circulation and reinforce neighborhood structure, the elementary school sites shall be located within $\frac{3}{4}$ miles walking distance of all homes in the neighborhood.

Site Visibility. School sites should provide a minimum peripheral visibility (typically 200 feet) from planned site driveways. Sites shall be easily accessible from collector roads and comply with school bus requirements for driveways.

Walk to School. The future schools should also be a part of a "Walk to School" program with the Patterson Unified School District. This program will promote safe walking and biking to school.

School development involves site-specific traffic concerns, including the provision of adequate areas for student drop-off, bus movements, safe pedestrian and other access issues. However, the development of each site should consider all the issues and key design criteria as mentioned above.

Since site-specific school plans will not be available during the preparation of this EIR, the preparation of a site-specific traffic study in conjunction with the review and approval of each school site for actual development might be required in the future.

Roundabouts

Another traffic solution that many jurisdictions have adopted is the use of roundabouts in place of traffic signals or stop-controlled intersections. Roundabouts have been used for a long time in countries such as Great Britain, France, Australia, the Netherlands and others. The merits of roundabouts are well known and documented.

The Federal Highway Administration (FHWA) published *Roundabouts: An Informational Guide* in June 2000, which provides state-of-the-practice guidance based upon national and international research and experience. The most comprehensive survey of roundabout safety in the U.S. was carried out in 1997 by the Transportation Research Board (TRB), and found that at intersections, which were converted to roundabouts, overall crashes were reduced by 37 percent and injury accidents by 51 percent.

Generally, roundabouts offer approximately 30 percent higher traffic-moving capacity than traffic signals, which in many circumstances leads to significantly reduced delays. The TRB survey of intersections converted to roundabouts in the U.S., for example, found that peak hour delays had been reduced by an average of 77 percent.

The TRB in a 1997 survey of 44 state departments of transportation in the United States studied 31 roundabout cases, representing a total of 38 individual roundabouts. In it, one of the most interesting results compares public attitudes before and after construction of roundabouts. The results are shown in the table below.

<i>Roundabout Survey</i>		
<i>Attitude</i>	<i>Percent Before Construction</i>	<i>Percent After Construction</i>
Very Negative	23	0
Negative	45	0
Neutral	18	27
Positive	14	41
Very Positive	0	32
Total	100	100

Since roundabout has been used in Patterson for sometime, its use in Patterson will likely not be an issue with future residents.

Caltrans has published Design Information Bulletin (DIB) DIB 80-01 in October 2003 – Roundabouts. In it, Caltrans encourages designers to consider the roundabout as a strategy or countermeasure to optimize intersection safety and operations. The use of modern roundabouts is proposed at several locations along the north-south collector streets and will be a positive addition to the Villages of Patterson.

FUTURE YEAR 2030 CONDITIONS

Methodology

The Year 2030 Model land use and network assumptions were used for the traffic projections. Both the 2030 land use and network assumptions were received from StanCOG. The StanCOG Model was used to forecast turning movement volumes and link volumes for Future Year 2030 conditions.

Level of Service Analysis

Figure 10 shows the forecasted peak hour turning movement volumes for the Future Year 2030 conditions. Figures 11 show the proposed lane geometry for the Future Year 2030 conditions. Based on input by city staff, improvements planned by Year 2030 were recognized at the intersections of Rogers Road (#3), Baldwin Road (#4) and American Eagle Drive (#6) at Sperry Avenue, Poplar Avenue/Las Palmas Avenue (#23), Carpenter Road/West Main Street (#24) and Crows Landing Road/West Main Street (#25) as shown on Figure 11. The intersections of Poplar Avenue/Las Palmas Avenue, Carpenter Road/W. Main Street and Crows Landing Road/ W. Main Street are planned to be signalized by Year 2030. With the planned improvements and the identified mitigations all the study intersections are expected to operate acceptably in this scenario. Table IX summarizes the results of the intersection level of service analysis in this scenario. Detailed calculations are shown in Appendix F.

These improvements include the following:

Intersection #3: Rogers Road/Sperry Avenue – assumes Rogers Road is extended south beyond Sperry Avenue and expands the intersection. Southbound add one through lane and a second right-turn lane; westbound add a second through lane and two left-turn lanes; northbound add a left-turn lane, a through/right lane and a right-turn lane; eastbound add additional left-turn and through lanes and a new right-turn lane.

Intersection #4: Baldwin Road/Sperry Avenue – add a second westbound through lane and an exclusive eastbound right-turn lane.

Intersection #6: American Eagle Drive/Sperry Avenue – add exclusive right and left-turn lanes southbound; add an exclusive right-turn lane northbound; and add a second left-turn lane and an exclusive right-turn lane eastbound.

Intersection #23: Poplar/E. Las Palmas/West Main – signalize the intersection; southbound, convert right-turn lane to a right/left turn lane at this “T” intersection; westbound add an exclusive right-turn lane, convert the existing right/through lane to a through lane and add a second through lane; eastbound add a second through lane.

Intersection #24: Carpenter Road/West Main – add a traffic signal; southbound add exclusive left- and right-turn lanes; westbound add exclusive left-turn and through lanes and retain a through/right lane; northbound add a left-turn lane; and eastbound add a through lane and two left-turn lanes.

Intersection #25: Crows Landing Road/West Main Street – add a traffic signal; southbound add exclusive left-turn lane; westbound add an exclusive left-turn lane and a through lane; northbound add an exclusive left-turn lane and convert the through/left lane to a through/right lane; and eastbound add two exclusive left-turn lanes, convert the through/left lane to a through lane, and add a through/right lane.

Based on the results of the projected traffic at the buildout of approved and proposed project trips, intersections that require improvement measures in this scenario are described below:

1. Sperry Ave/I-5 SB Off Ramps

Signalize intersection. Southbound: add left turn lane. Westbound: add two left turn lanes.

2. Sperry Ave/I-5 NB On-Ramps

Signalize intersection. Eastbound: add left turn lane. Westbound: add a right turn lane. Northbound: add right turn lane.

7. Sperry Ave/Las Palmas Ave

Signalize intersection.

8. Sperry Ave/Ward Ave

Eastbound: add two left turn lanes. Add a shared through and right turn lane. Westbound: add a left turn lane and a through lane. Northbound: add a left turn lane. Southbound: add a right turn lane.

9. Sperry Avenue/S. Del Puerto Avenue

Add eastbound and westbound left turn lanes.

10. Sperry Ave/SR 33

Signalize intersection. Eastbound: add left turn and right turn lanes. Westbound: add a left turn lane. Northbound: add two left turn lanes. Southbound: add a left turn lane; restripe the shared through and left turn lane as a shared through and right turn lane.

13. Ward Ave/SR 33

Signalize intersection. Add a northbound left turn lane.

14. Zacharias Rd/SR 33

Signalize intersection. Northbound: add a left turn lane. Eastbound: add a left turn lane.

Under this scenario, the projected traffic on SR 33 between Ward Avenue and Zacharias Road is nearly 900 vehicles during the a.m. peak hour. Therefore, a four-lane road is recommended on SR 33 between Ward Avenue and Zacharias Road.

16. Rogers Rd/SR 33

Signalize intersection. Add eastbound and northbound left turn lanes. Southbound: add a right turn lane.

17. SR 33/Eucalyptus Ave

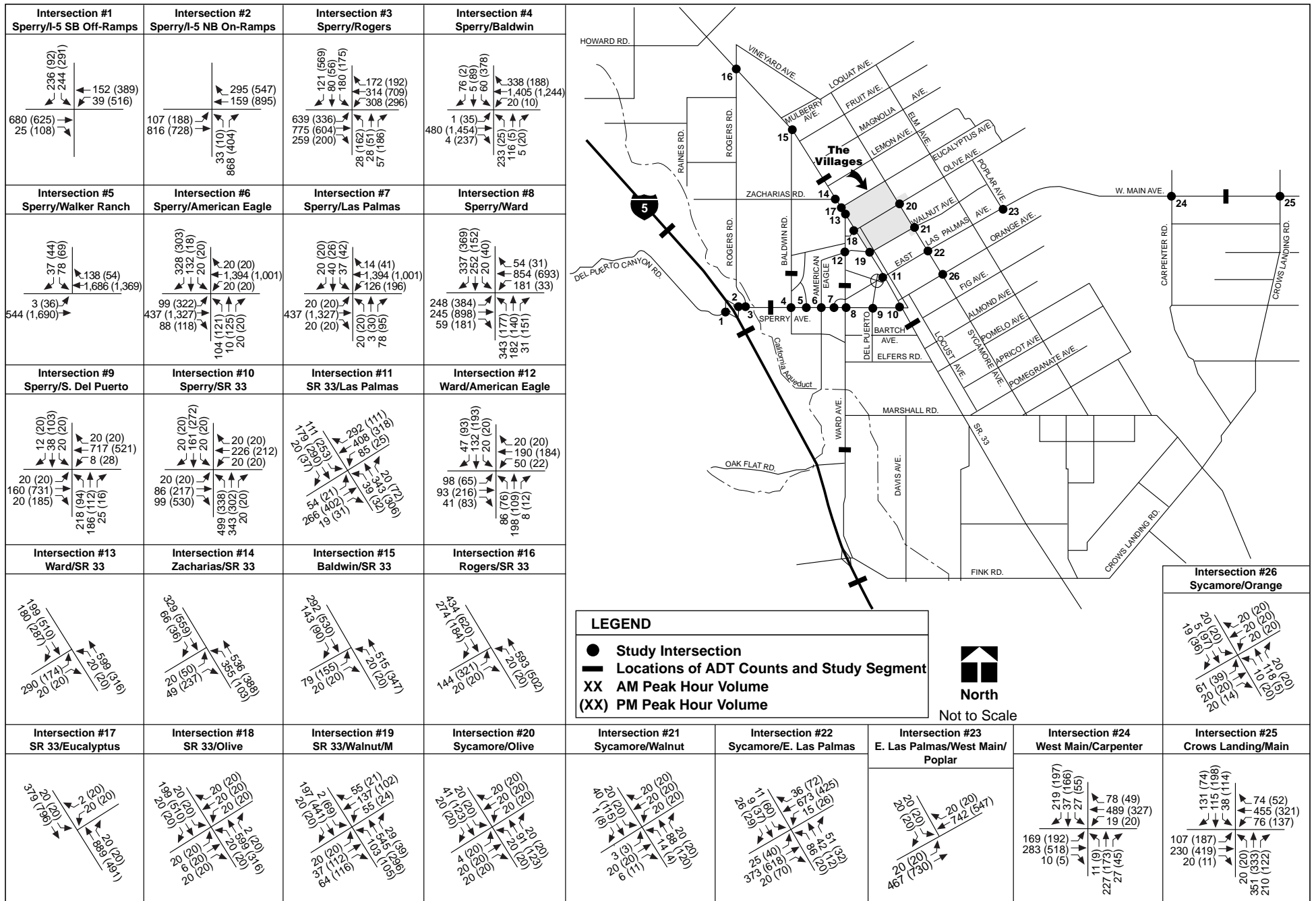
Southbound: add a left turn and through lane. Northbound: add a through lane

19. Walnut Ave/M Street/SR 33

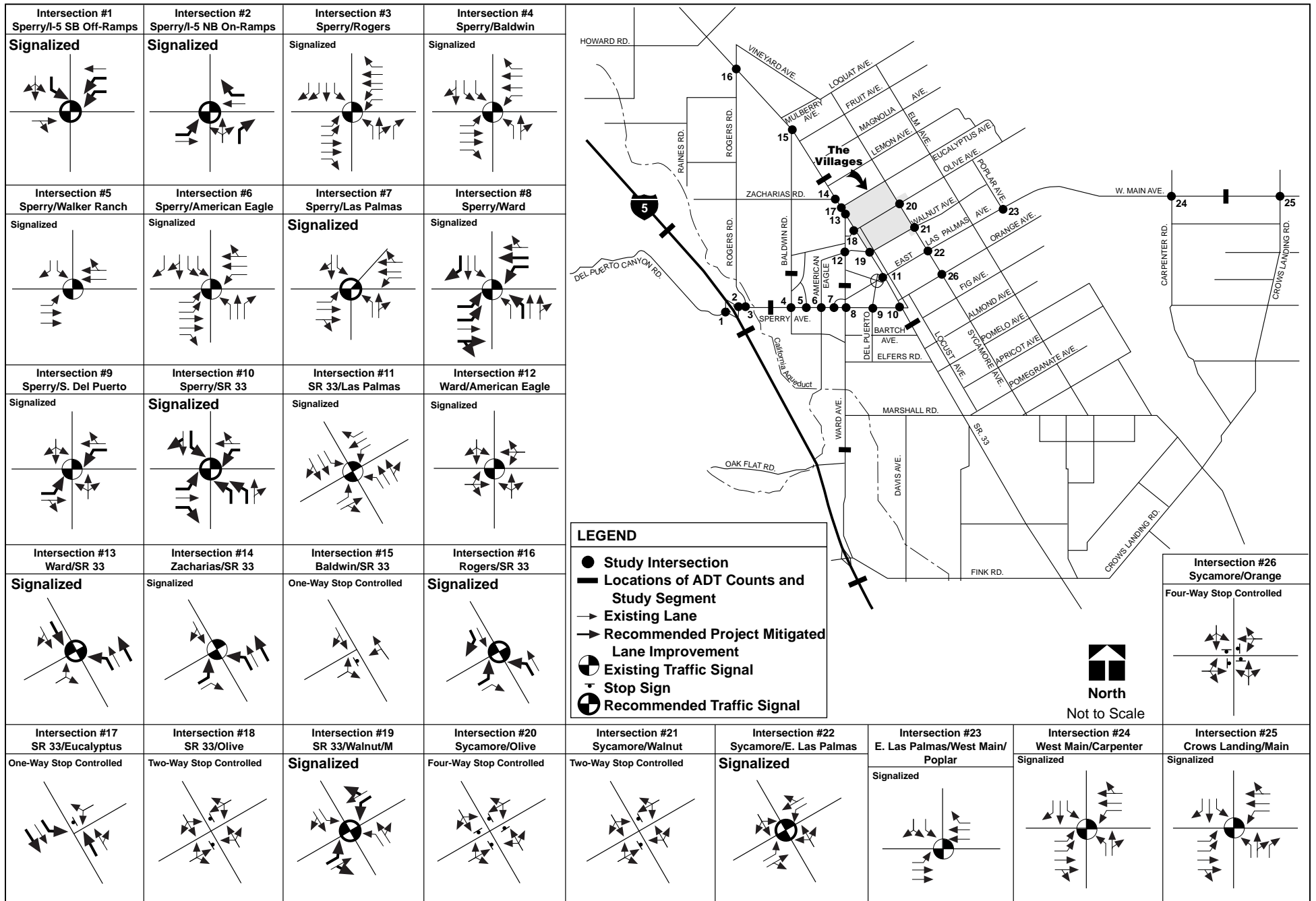
Signalize intersection. Eastbound, Westbound: add a left turn lane and restripe shared through and left turn lane as a shared through and right turn lane.

22. E. Las Palmas Ave/Sycamore Ave

Signalize intersection.



City of Patterson
The Villages of Patterson Traffic Study
Future Year 2030 Base Peak Hour Turning Movement Volumes



City of Patterson
 The Villages of Patterson Traffic Study
Future Year 2030 Lane Geometry

Figure
11



TABLE IX: INTERSECTION LEVELS OF SERVICE – FUTURE 2030 BASE CONDITIONS

Study Intersections	Existing Control	Future 2030 Base (Mitigated)	Future 2030 Base Conditions							
			A.M.		A.M. Mitigated		P.M.		P.M. Mitigated	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1. Sperry Ave/I-5 SB Off-Ramps	Unsignalized	Signalized	103.1(>120)	F(F)	14.8	B	>120(>120)	F(F)	25.5	C
2. Sperry Ave/I-5 NB On-Ramps	Unsignalized	Signalized	>120(>120)	F(F)	18.7	B	83.7(>120)	F(F)	5.6	A
3. Sperry Ave/Rogers Road	Signalized	Signalized	30.4	C	—	—	24.4	C	—	—
4. Sperry Ave/Baldwin Rd	Signalized	Signalized	15.5	B	—	—	10.8	B	—	—
5. Sperry Avenue/Walker Parkway	Signalized	Signalized	7.8	A	—	—	7.2	A	—	—
6. Sperry Ave/American Eagle Dr	Signalized	Signalized	22.8	C	—	—	17.6	B	—	—
7. Sperry Ave/Las Palmas Ave	Unsignalized	Signalized	>120(>120)	F(F)	4.0	A	>120(>120)	F(F)	8.3	A
8. Sperry Ave/Ward Ave	Signalized	Signalized	>120	F	26.7	C	>120	F	16.1	B
9. Sperry Ave/S Del Puerto Ave	Signalized	Signalized	19.1	B	19.0	B	14.1	B	13.8	B
10. Sperry Ave/SR-33	Unsignalized	Signalized	>120(>120)	F(F)	14.3	B	>120(>120)	F(F)	12.2	B
11. SR-33/Las Palmas Ave	Signalized	Signalized	11.7	B	—	—	17.0	B	—	—
12. Ward Ave/ American Eagle Dr	Signalized	Signalized	7.4	A	—	—	7.4	A	—	—
13. Ward Ave/SR-33	Unsignalized	Signalized	42.7(>120)	E(F)	6.9	A	11.4(76.7)	B(F)	5.2	A
14. Zacharias Rd/SR-33 ¹	Unsignalized	Signalized	6.8(41.7)	A(E)	2.7	A	13.0(56.7)	B(F)	5.2	A
15. Baldwin Rd/SR-33	Unsignalized	Unsignalized	2.5(23.8)	A(C)	—	—	7.7(49.8)	A(E)	—	—
16. Rogers Rd/SR-33	Unsignalized	Signalized	12.6(111.5)	A(F)	6.2	A	>120(>120)	F(F)	9.3	A
17. SR-33/Eucalyptus Ave	Unsignalized	Unsignalized	0.8(33.9)	A(D)	0.6(29.3)	A(D)	1.1(25.4)	A(D)	0.6(16.9)	A(C)
18. Olive Avenue/SR-33	Unsignalized	Unsignalized	3.0(24.1)	A(C)	—	—	3.5(25.8)	A(D)	—	—
19. Walnut Avenue/M Street/SR-33	Unsignalized	Signalized	57.7(>120)	F(F)	7.0	A	102.9(>120)	F(F)	6.1	A
20. Olive Ave/Sycamore Ave	Unsignalized	Unsignalized	7.8	A	—	—	8.4	A	—	—
21. Walnut Ave/Sycamore Ave	Unsignalized	Unsignalized	4.4(10.4)	A(B)	—	—	3.2(11.1)	A(B)	—	—
22. Las Palmas Avenue/Sycamore Ave	Unsignalized	Signalized	>120(>120)	F(F)	8.0	A	110.3(>120)	F(F)	6.9	A
23. Poplar Ave/Las Palmas Ave	Unsignalized	Signalized	4.8	A	—	—	4.8	A	—	—
24. Carpenter Rd/W Main Ave	Unsignalized	Signalized	10.7	B	—	—	9.8	A	—	—
25. Crows Landing Rd/W Main Ave	Unsignalized	Signalized	10.9	B	—	—	13.7	B	—	—
26. West Main/Carpenter	Unsignalized	Unsignalized	8.1	A	—	—	7.9	A	—	—

Notes: LOS = Level of Service

X = Intersection level of service

X.X = Overall intersection delay in seconds per vehicle

(X) = Level of service for the minor approach

Delay = Average stopped delay at signalized intersections and average delay for all movements at STOP-controlled intersections.

Signalized in Bold is a mitigation measure

¹ An exclusive northbound left turn lane is warranted

Table X summarizes the results of the roadway segment level of service analysis in this scenario. All 26 study roadway segments are expected to operate acceptably with the existing lane configurations in this scenario.

TABLE X: ROADWAY SEGMENT LEVELS OF SERVICE – YEAR 2030 BASE CONDITIONS

No.	Freeway / Roadway Segment	Direction	Dir. Lanes	Capacity	A.M. Peak Hour			P.M. Peak Hour		
					Volume (Veh.)	Speed (mph)	LOS	Volume (Veh.)	Speed (mph)	LOS
1.	I-5, n/o Sperry Ave. ¹	NB	2	4,600	2,964	-	C	3,128	-	C
		SB	2	4,600	2,978	-	C	2,988	-	C
2.	I-5, s/o Sperry Ave. ¹	NB	2	4,600	3,284	-	C	2,707	-	C
		SB	2	4,600	2,402	-	B	3,119	-	C
3.	I-5, s/o Fink Rd. ¹	NB	2	4,600	2,668	-	C	2,522	-	B
		SB	2	4,600	2,504	-	B	2,667	-	C
4.	Sperry Ave. ² e/o Rogers Rd.	EB	2	2,280	940	25.5	C	966	25.5	C
		WB	2	2,280	794	26.0	C	1,198	25.0	C
5.	Baldwin Rd, n/o Sperry Ave. ²	EB	1	890	537	18.0	C	280	19.0	C
		WB	1	890	197	19.0	C	504	17.5	D
6.	SR-33, n/o Zacharias Rd. ²	NB	1	1,140	607	28.5	C	504	29.0	C
		SB	1	1,140	432	29.0	C	643	28.5	C
7.	SR-33, s/o Sperry Ave. ²	NB	1	1,140	882	26.0	D	612	28.0	C
		SB	1	1,140	247	30.5	C	819	26.0	D
8.	Ward Ave., n/o Las Palmas Ave. ²	NB	1	1,140	449	25.0	C	525	25.0	C
		SB	1	1,140	581	24.5	C	524	25.0	C
9.	Ward Ave., s/o Marshall Rd. ²	NB	1	1,140	488	25.0	C	418	26.0	C
		SB	1	1,140	442	26.0	C	323	26.5	C
10.	E. Las Palmas Ave., e/o Sycamore Ave. ²	EB	1	1,140	71	26.0	C	233	25.5	C
		WB	1	1,140	252	26.0	C	153	26.5	C
11.	Main St., e/o Carpenter Rd. ²	EB	1	1,140	321	25.5	C	637	24.5	C
		WB	1	1,140	602	24.0	C	387	25.5	C

Notes: ¹Highway Capacity Manual 2000 – Basic Freeway Segments Analysis; LOS based on density, not speed.

²Highway Capacity Manual 2000 – Urban Streets Analysis.

LOS (C) - Mitigated LOS based on four-lane Sperry Avenue

FUTURE 2030 BASE YEAR PLUS PROJECT CONDITIONS

Methodology

This scenario adds the traffic generated by the proposed Project to the future Year 2030 conditions. The StanCOG Model was used to forecast turning movement volumes at the study intersections and link volumes at the study segments.

As mentioned previously, the proposed Villages of Patterson will be a new residential and mixed-use village community with approximately 852 Low Density Residential dwelling units, 1,709 Medium Density Residential dwelling units, 232 High Density Residential dwelling units and 307 mix of multi-family residential including live-work dwelling units at the Village Circle for a total of 3,100 dwelling units. In addition, the proposed Project consists of approximately 623,800 square feet of Light Industrial development, approximately 433,400 square feet of Public/Quasi-Public uses and up to approximately 100,000 square feet total including office, retail, civic uses and home-based business at the Village Circle.

Level of Service Analysis

Figure 12 shows the Future Year 2030 plus Project peak hour turning movement volumes. In essence, the figure shows the projected buildout of the future 2030 traffic for the cumulative land use of the City of Patterson and the proposed project. Figure 13 shows the Future Year 2030 plus Project lane geometry. In this scenario, compared to the Future Year 2030 Base conditions, two additional intersections (SR 33/Eucalyptus and SR 33/Olive Avenue) need signalization. Figure 13 shows the planned improvements at the study intersections 3,4,6,11,23, 24 and 25 (same as under the Year 2030 Base Conditions) and proposed mitigations needed at other intersections. With the planned improvements and identified mitigations, all study intersections are expected to operate acceptably in this scenario. Table XI summarizes the results of the intersection levels of service in this scenario. Detailed calculations are shown in Appendix G.

Based on the results of the projected traffic at the future 2030 base year and the proposed project trips, intersections that require mitigation measures in this scenario are described below:

1. Sperry Ave/I-5 SB Off Ramps

Signalize intersection. Eastbound: add a through lane. Westbound: add two left turn lanes. Southbound: add a left turn lane.

2. Sperry Ave/I-5 NB On-Ramps

Signalize intersection. Eastbound: add left turn and through lanes. Westbound: add right turn and through lanes. Northbound: add two right turn lanes.

7. Sperry Ave/Las Palmas Ave

Signalize intersection. Eastbound: add a right turn lane.

8. Sperry Ave/Ward Ave

Eastbound: add two left turn lanes; restripe the shared through and left turn lane as a shared through and right turn lane. Westbound: add a left turn lane and a through lane. Northbound: add a left turn lane. Southbound: add a right turn lane.

9. Sperry Ave/S. Del Puerto Ave

Add eastbound and westbound left turn and through lanes.

10. Sperry Ave/SR 33

Signalize intersection. Eastbound: add left turn and right turn lanes. Westbound: add a left turn lane. Northbound: add two left turn lanes. Southbound: add a left turn lane; restripe the shared through and left turn lane as a shared through and right turn lane.

12. Ward Ave/American Eagle Dr

Add eastbound, westbound, northbound and southbound left turn lanes.

13. SR 33/Ward Ave

Signalize intersection. Add a northbound left turn lane.

14. Zacharias Rd/SR 33

Signalize intersection. Northbound: add two left turn lanes. Eastbound: add a left turn lane. Under this scenario, the projected traffic on SR 33 between Ward Avenue and Zacharias Road is nearly 900 vehicles during the a.m. peak hour. Consequently, a four-lane road is recommended on SR 33 between Ward Avenue and Zacharias Road. The project will make its fair share contribution.

In addition, a four-lane road on Zacharias Road would be required to accommodate the projected traffic. Two westbound lanes on Zacharias Road between SR 33 and Baldwin Road would be required to accommodate the two northbound left-turn lanes. An annual traffic-monitoring program should be conducted to assess when the widening is required. The project will make its fair share contribution.

Based on the model results, a new future freeway connection to I-5 is not needed based on future capacity demand alone. However, a future interchange should be considered at Zacharias Road/I-5, as it will provide better access for future trips to the north of Sperry Avenue.

16. Rogers Rd/SR 33

Signalize intersection. Eastbound: add two left turn lanes. Northbound: add a left turn lane. Southbound: add a right turn lane.

17. SR 33/Eucalyptus Ave

Signalize intersection. Westbound: add a left turn lane. Northbound: add a right turn lane. Southbound: add a left turn lane.

18. Olive Ave/SR 33

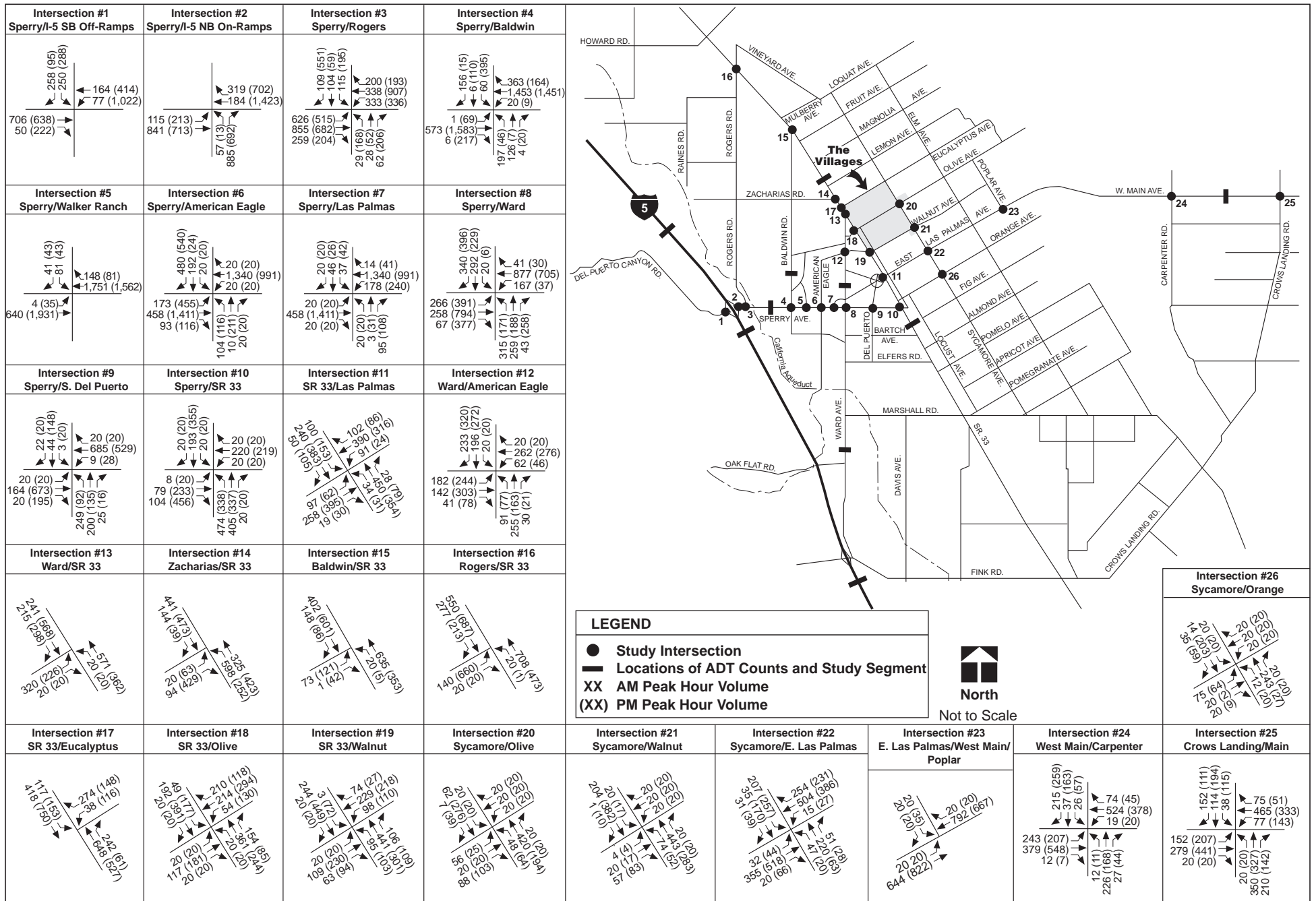
Signalize intersection. Add eastbound, westbound, northbound and southbound left turn lanes.

19. Walnut Ave/M Street/SR 33

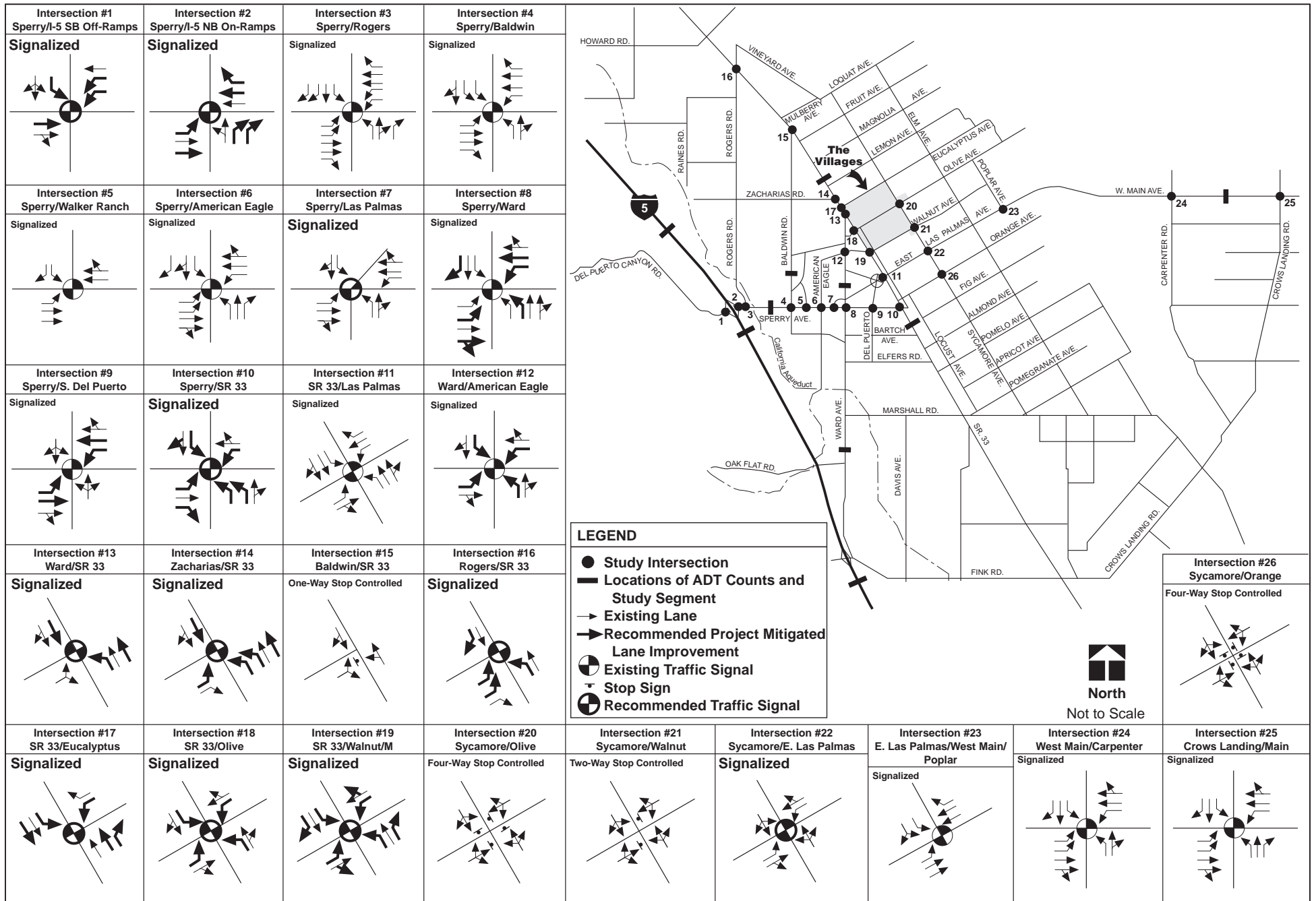
Signalize intersection. Eastbound, Westbound: add a left turn lane and restripe shared through and left turn lane as a shared through and right turn lane. Northbound, Southbound: add a left turn lane and a right turn lane.

22. E. Las Palmas Ave/Sycamore Ave

Signalize intersection.



City of Patterson
The Villages of Patterson Traffic Study
Future Year 2030 + Project Base Peak Hour Turning Movement Volumes



City of Patterson
 The Villages of Patterson Traffic Study
2030 Plus Project Lane Geometry

TABLE XI: FUTURE 2030 BASE CONDITION PLUS PROJECT LEVELS OF SERVICE

Study Intersections	Future Year 2030 Base Control	Future 2030 Base plus Project (Mitigated)	Future 2030 Base plus Project Conditions							
			A.M.		A.M. Mitigated		P.M.		P.M. Mitigated	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1. Sperry Ave/I-5 SB Off-Ramps	Signalized	Signalized	17.9	B	12.2	B	74.5	E	20.7	C
2. Sperry Ave/I-5 NB On-Ramps	Signalized	Signalized	>120(>120)	F	19.9	B	>120(>120)	F	11.2	B
3. Sperry Ave/Rogers Road	Signalized	Signalized	26.5	C	—	—	29	C	—	—
4. Sperry Ave/Baldwin Rd	Signalized	Signalized	17.7	B	—	—	14.8	B	—	—
5. Sperry Avenue/Walker Parkway	Signalized	Signalized	6.4	A	—	—	12	B	—	—
6. Sperry Ave/American Eagle Dr	Signalized	Signalized	31	C	—	—	22	C	—	—
7. Sperry Ave/Las Palmas Ave	Signalized	Signalized	4.1	A	—	—	15.1	B	—	—
8. Sperry Ave/Ward Ave	Signalized	Signalized	26.3	C	—	—	20	B	—	—
9. Sperry Ave/S Del Puerto Ave	Signalized	Signalized	20.5	C	11.3	B	13	B	7.2	A
10. Sperry Ave/SR-33	Signalized	Signalized	14	B	14.3	B	13	B	12	B
11. SR-33/Las Palmas Ave	Signalized	Signalized	13.3	B	—	—	14.6	B	—	—
12. Ward Ave/ American Eagle Dr	Signalized	Signalized	11.5	B	7.2	A	35.6	D	11.3	B
13. Ward Ave/SR-33	Signalized	Signalized	6.9	A	8.4	A	6.3	A	6.6	A
14. Zacharias Rd/SR-33	Signalized	Signalized	19.9	B	3.2	A	13.1	B	9.7	A
15. Baldwin Rd/SR-33	Unsignalized	Unsignalized	2.4(38.6)	A(E)	—	—	5.8(42.7)	A(E)	—	—
16. Rogers Rd/SR-33	Signalized	Signalized	6.6	A	5.6	A	24.4	C	10.8	B
17. SR-33/Eucalyptus	Unsignalized	Signalized	5.2(24.4)	A(C)	5.5	A	35.3(>120)	E(F)	4.8	A
18. Olive Avenue/SR-33	Unsignalized	Signalized	>120(>120)	F(F)	8.7	A	>120(>120)	F(F)	10	B
19. Walnut Avenue/M Street/SR-33	Signalized	Signalized	8.8	A	9.7	A	8.6	A	10.4	B
20. Olive Ave/Sycamore Ave	Unsignalized	Unsignalized	14.4	B	—	—	11.2	B	—	—
21. Walnut Ave/Sycamore Ave	Unsignalized	Unsignalized	4.0(22.8)	A(C)	—	—	3.9(22.2)	A(C)	—	—
22. Las Palmas Avenue/Sycamore Ave	Signalized	Signalized	18.4	B	—	—	17.3	B	—	—
23. Poplar Ave/Las Palmas Ave	Signalized	Signalized	4.7	A	—	—	4.8	A	—	—
24. Carpenter Rd/W Main Ave	Signalized	Signalized	6.6	A	—	—	5.9	A	—	—
25. Crows Landing Rd/W Main Ave	Signalized	Signalized	6.7	A	—	—	7.2	A	—	—
26. West Main/Carpenter	Unsignalized	Unsignalized	9.3	A	—	—	9	A	—	—

Notes: LOS = Level of Service
X (X) = Intersection level of service (Level of service for the minor approach)
X.X (X.X) = Average Intersection Delay in seconds per vehicle (Average Delay in seconds per vehicle for the minor approach)

Table XII shows the results of the roadway segment levels of service in this scenario. All study segments are expected to operate acceptably with the existing lane configurations in this scenario.

TABLE XII: ROADWAY SEGMENT LEVELS OF SERVICE – YEAR 2030 PLUS PROJECT CONDITIONS

No.	Freeway / Roadway Segment	Direction	Dir. Lanes	Capacity	A.M. Peak Hour			P.M. Peak Hour		
					Volume (Veh.)	Speed (mph)	LOS	Volume (Veh.)	Speed (mph)	LOS
1.	I-5, n/o Sperry Ave. ¹	NB	2	4,600	3,022	-	C	3,119	-	C
		SB	2	4,600	2,997	-	C	3,064	-	C
2.	I-5, s/o Sperry Ave. ¹	NB	2	4,600	3,355	-	D	2,742	-	C
		SB	2	4,600	2,403	-	B	3,159	-	C
3.	I-5, s/o Fink Rd. ¹	NB	2	4,600	2,683	-	C	2,529	-	B
		SB	2	4,600	2,512	-	B	2,686	-	C
4.	Sperry Ave. ² e/o Rogers Road	EB	2	2,280	1,031	25.5	C	1,083	25.0	C
		WB	2	2,280	872	26.0	C	1,437	24.0	C
5.	Baldwin Rd, n/o Sperry Ave. ²	EB	1	890	493	17.0	D	327	18.0	C
		WB	1	890	242	18.5	C	520	17.0	D
6.	SR-33, n/o Zacharias Rd. ²	NB	1	1,140	703	27.0	C	469	28.5	C
		SB	1	1,140	540	28.0	C	703	29.0	C
7.	SR-33, s/o Sperry Ave. ²	NB	1	1,140	894	26.5	D	633	25.0	C
		SB	1	1,140	280	30.0	C	862	26.5	D
8.	Ward Ave., n/o Las Palmas Ave. ²	NB	1	1,140	537	25.5	C	562	25.5	C
		SB	1	1,140	624	25.0	C	636	25.0	C
9.	Ward Ave., s/o Marshall Rd. ²	NB	1	1,140	598	25.0	C	574	25.0	C
		SB	1	1,140	522	25.5	C	556	25.0	C
10.	E. Las Palmas Ave., e/o Sycamore Ave. ²	EB	1	1,140	178	26.5	C	376	26.0	C
		WB	1	1,140	374	26.0	C	29	27.0	C
11.	Main St., e/o Carpenter Rd. ²	EB	1	1,140	423	26.0	C	652	25.0	C
		WB	1	1,140	622	24.5	C	437	26.0	C

Notes: ¹Highway Capacity Manual 2000 – Basic Freeway Segments Analysis; LOS based on density, not speed.

²Highway Capacity Manual 2000 – Urban Streets Analysis.

LOS (C) - Mitigated LOS based on four-lane Sperry Avenue

Percent Project Contribution

A model select zone analysis was performed to determine the percent project contribution at each study intersection under the following two scenarios:

1. EPAP plus Project Conditions
2. Year 2030 Base plus Project Conditions

The percent project traffic contribution to each scenario is shown below. Table XIII shows the results of the analysis for the EPAP plus Project conditions. Table XIV shows the results of the analysis for the Year 2030 Base plus Project conditions.

**TABLE XIII: PERCENT PROJECT TRIP CONTRIBUTION AT STUDY INTERSECTIONS –
EPAP PLUS PROJECT CONDITIONS**

<i>Intersection</i>	<i>Project Traffic</i>	<i>EPAP + Project Traffic</i>	<i>Percent Project Traffic</i>
1. Sperry Ave/I-5 SB Off-Ramps	55	1,338	4.1
2. Sperry Ave/I-5 NB On-Ramps	106	2,100	5.0
3. Sperry Ave/Rogers Road	285	2,436	11.7
4. Sperry Ave/Baldwin Rd	498	3,915	12.7
5. Sperry Avenue/Walker Parkway	511	3,632	14.1
6. Sperry Ave/American Eagle Dr	559	3,761	14.9
7. Sperry Ave/Las Palmas Ave	88	2,606	3.4
8. Sperry Ave/Ward Ave	132	2,833	4.7
9. Sperry Ave/S Del Puerto Ave	21	1,207	1.7
10. Sperry Ave/SR-33	158	1,644	9.6
11. SR-33/Las Palmas Ave	278	1,868	14.9
12. Ward Ave/ American Eagle Dr	889	1,670	53.2
13. Ward Ave/SR-33	454	1,103	41.2
14. Zacharias Rd/SR-33	699	1,410	49.6
15. Baldwin Rd/SR-33	304	907	33.5
16. Rogers Rd/SR-33	304	1,220	24.9
17. SR-33/Eucalyptus	822	1,471	55.9
18. Olive Ave/SR-33	1,017	1,519	67.0
19. Walnut Ave/M Street/SR-33	581	1,543	37.7
20. Olive Ave/Sycamore Ave	297	493	60.2
21. Walnut Ave/Sycamore Ave	437	615	71.1
22. Las Palmas Avenue/Sycamore Ave	416	1,703	24.4
23. Poplar Ave/Las Palmas Ave	365	1,667	21.9
24. Carpenter Rd/W Main Ave	314	1,631	19.3
25. Crows Landing Rd/W Main Ave	241	1,614	14.9
26. Orange Ave/Sycamore Ave	69	221	31.2

**TABLE XIV: PERCENT PROJECT TRIP CONTRIBUTIONS AT STUDY INTERSECTIONS –
YEAR 2030 BASE PLUS PROJECT CONDITIONS**

<i>Intersection</i>	<i>Project Traffic</i>	<i>2030+Project Traffic</i>	<i>Percent Project Traffic</i>
1. Sperry Ave/I-5 SB Off-Ramps	66	2,679	2.5
2. Sperry Ave/I-5 NB On-Ramps	128	4,394	2.9
3. Sperry Ave/Rogers Road	178	4,068	4.4
4. Sperry Ave/Baldwin Rd	423	4,086	10.4
5. Sperry Avenue/Walker Parkway	408	3,900	10.5
6. Sperry Ave/American Eagle Dr	462	3,944	11.7
7. Sperry Ave/Las Palmas Ave	70	2,970	2.4
8. Sperry Ave/Ward Ave	172	3,582	4.8
9. Sperry Ave/S Del Puerto Ave	67	1,896	3.5
10. Sperry Ave/SR-33	167	2,058	8.1
11. SR-33/Las Palmas Ave	344	2,018	17.0
12. Ward Ave/ American Eagle Dr	801	1,840	43.5
13. Ward Ave/SR-33	425	1,494	28.4
14. Zacharias Rd/SR-33	600	1,679	35.7
15. Baldwin Rd/SR-33	319	1,208	26.4
16. Rogers Rd/SR-33	319	2,054	15.5
17. SR-33/Eucalyptus	721	1,755	41.1
18. Olive Ave/SR-33	981	1,700	57.7
19. Walnut Ave/M Street/SR-33	591	1,753	33.7
20. Olive Ave/Sycamore Ave	366	821	44.6
21. Walnut Ave/Sycamore Ave	490	928	52.8
22. Las Palmas Avenue/Sycamore Ave	474	1,849	25.6
23. Poplar Ave/Las Palmas Ave	366	1,584	23.1
24. Carpenter Rd/W Main Ave	335	1,907	17.6
25. Crows Landing Rd/W Main Ave	208	2,104	9.9
26. Orange Ave/Sycamore Ave	116	484	24.0

STUDY PARTICIPANTS AND REFERENCES

Study Participants

Chris D. Kinzel, PE	Principal-In-Charge
Christopher Thnay, PE, AICP	Project Manager
Pratyush Bhatia, PE	Transportation Engineer
Allen Nie, PhD	Travel Demand Forecasts
Vishnu Gandluru	Transportation Engineer
Geri Foley	Graphics
Margie Pfaff	Word Processing

Persons Consulted

Cleve Morris, City Manager – City of Patterson
Rod Simpson, Planning Director – City of Patterson
Carlos Yamzon, Chief, Travel Forecasting and Metropolitan Planning – Caltrans District 10
Lark Downs, Senior Planner/Transportation Modeler – Stanislaus Council of Governments
Kirk Ford, Senior Planner – Stanislaus County

References

1. Lengths of Left Turn Lanes at Unsignalized Intersections, *Transportation Research Record 1500*, Partha Chakaraborty, Shinya Kikuchi and Mark Luszcz.
2. *Design Information Bulletin (DIB) DIB 80-01* in October 2003 – Roundabouts, Caltrans.
3. *Street Design Guidelines for Healthy Neighborhoods*, Local Government Commission, Center for Livable Communities, January 1999.

APPENDIX A – LEVEL OF SERVICE METHODOLOGY

**APPENDIX B – LEVEL OF SERVICE WORKSHEETS:
EXISTING CONDITIONS**

APPENDIX C – STANCOG MODEL CALIBRATION

**APPENDIX D – LEVEL OF SERVICE WORKSHEETS:
EPAP CONDITIONS**

**APPENDIX E – LEVEL OF SERVICE WORKSHEETS:
EPAP PLUS PROJECT CONDITIONS**

**APPENDIX F – LEVEL OF SERVICE WORKSHEETS:
YEAR 2030 CONDITIONS**

**APPENDIX G – LEVEL OF SERVICE WORKSHEETS:
YEAR 2030 PLUS PROJECT CONDITIONS**

APPENDIX C: BIOTIC STUDY

VILLAGES OF PATTERSON

BIOTIC STUDY

Prepared by:

H.T. Harvey & Associates

Scott B. Terrill, Ph.D., Principal
Brian B. Boroski, Ph.D., Division Head
Daniel G. Duke, J.D., Assistant Project Manager
Jeff Seay, Wildlife Biologist
Amanda Breen, Ph.D., Botanist

Prepared for:

Mike Kometani
Turnstone Consulting
330 Townsend Street, Suite 216
San Francisco, CA 94107

April 3, 2006

Project No. 2634-01

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EXECUTIVE SUMMARY

The Villages of Patterson Development Plan would result in the development of an approximately 692-acre (280 ha) project site in Stanislaus County, California northeast of the City of Patterson.

The Villages of Patterson project site has very limited plant species diversity due to the disturbed nature of the property and existing agricultural practices. Six habitats occur on the project site: irrigated row crops, orchards, fallow fields, ruderal, aquatic, and developed.

Based on information compiled during our analysis, the concrete-lined laterals on the project site do not appear to represent habitats within the regulatory jurisdiction of either the U.S. Army Corps of Engineers (USACE) or the California Department of Fish and Game (CDFG). The laterals remain dry for 4 to 6 months of the year, they are regularly maintained, cleared of debris by the Patterson Irrigation District, and contained water that was pumped into Main Canal and spilled operationally into Del Puerto Creek on the south side of the creek bank.

The project site provides suitable foraging habitat for Northern Harriers and Tricolored Blackbirds, and suitable nesting and foraging habitat for Loggerhead Shrikes. However, impacts to these species would be less than significant. Project implementation will not substantially reduce the habitat that is regionally available to these species, restrict their range, or cause regional populations to drop below self-sustaining levels.

Burrowing Owls, though not observed during field surveys, could inhabit the project site prior to construction if ground squirrels colonize portions of the site. A habitat assessment, in accordance with CDFG protocol for Burrowing Owls should occur prior to construction activities within the project area. If the habitat assessment confirms habitat is present, implementation of the mitigation measures outlined will reduce potential project related impacts to Burrowing Owls to a less than significant level and avoid “take” of the species; thereby, conforming to federal and state regulations protecting raptors.

Project implementation could result in significant direct and cumulative impacts to the Swainson’s Hawk due to the loss of approximately 506.5 acres (205 ha) of suitable foraging habitat for the species. The offsite preservation of CDFG-approved Habitat Management Lands would reduce these impacts to a less than significant level.

ENVIRONMENTAL SETTING

PROJECT DESCRIPTION

The Villages of Patterson Development Plan would establish a detailed framework for development of an approximately 692-acre (280 ha) project site in Stanislaus County, California (Figure 1) by identifying allowable land uses and their locations, and providing development standards and design guidelines. A mixed-use central core would be surrounded by four residential neighborhood quadrants offering a diverse range of housing types and integrated commercial and office uses. The Plan Area would be linked by a system of roads, parks, and bicycle/pedestrian trails. At build out, the Villages of Patterson is expected to accommodate up to approximately 3,100 dwelling units, up to about 723,800 square feet of commercial/office/light industrial uses, and up to about 433,400 square feet of public and civic uses.

The project site is generally bounded by North 1st Street and Highway 33 to the west, Eucalyptus Avenue to the north, Sycamore Avenue to the east, and Walnut Avenue to the south (Figure 2). The project site also includes an approximately 40-acre (16 ha) area at the northwest corner of Walnut Avenue and Sycamore Avenue, and an approximately 19-acre (7.6 ha) area at the southwest corner of Walnut and Sycamore Avenues.

GENERAL PROJECT AREA DESCRIPTION

The Villages of Patterson project site is located north and east of the City of Patterson, in unincorporated Stanislaus County, contiguous to, and outside of, the incorporated boundaries of Patterson. The project site is situated at an elevation of approximately 100 feet (30 m) in the western San Joaquin Valley of California. The site lies at approximately 75 feet (23 m) National Geodetic Vertical Datum (NGVD) in the northeast and approximately 95 feet (29 m) NGVD in the southwest.

The climate of the San Joaquin Valley is characterized by hot, dry summers and cool, moist winters with frequent heavy fog. Weather patterns in the valley result from the presence of the Coast Range to the west and the Sierra Nevada Mountains to the east. Overall, the Coast Range produces a rain shadow effect, with the majority of moisture falling on the coastal side of the mountains. During winter months, however, the offshore high pressure areas move further south on the coast, allowing the San Joaquin Valley to receive the majority (90%) of its annual precipitation. The average annual precipitation in Patterson ranges from 10 inches to 12 inches (25.4 to 30.5 cm) (Soil Conservation Service; SCS 2002). Temperatures range from an average high of 96 degrees Fahrenheit (F)(35.5 degrees Celcius [C]) and low of 63 degrees F (17.2 degrees C) in the summer, to an average high of 54 degrees F (12.2 degrees C) and low of 37 degrees F (2.7 degrees C) in the winter (National Weather Service).

According to the Soil Conservation Service (2002) the soils underlying the project site are moderately well drained with slow permeability, with the potential to flood. A summary of the soil types present on the project site is provided in Table 1 below.

Table 1. Summary of Soil Types Present on the Villages of Patterson Project Site.

Soil type	Slope percentage	Soil Coverage Percentage of Project Site
Capay clay	0-2%	12.3%
Capay clay, wet	0-2%	3.5%
Capay clay, rarely flooded	0-2%	31.3%
El Solyo silty clay loam, rarely flooded	0-2%	33.6%
Vernalis-Zacharias complex	0-2%	0.7%
Vernalis-Zacharias complex, rarely flooded	0-2%	18.3%
Vernalis loam, rarely flooded	0-2%	0.3%
Totals		100%

SCS Stanislaus County, Western Part 2002



Legend

 Project Location



H.T. HARVEY & ASSOCIATES
ECOLOGICAL CONSULTANTS

Villages of Patterson: Project Detail Map

File No. 2634-01

Date 3/24/06

Figure 2

BIOTIC SURVEYS

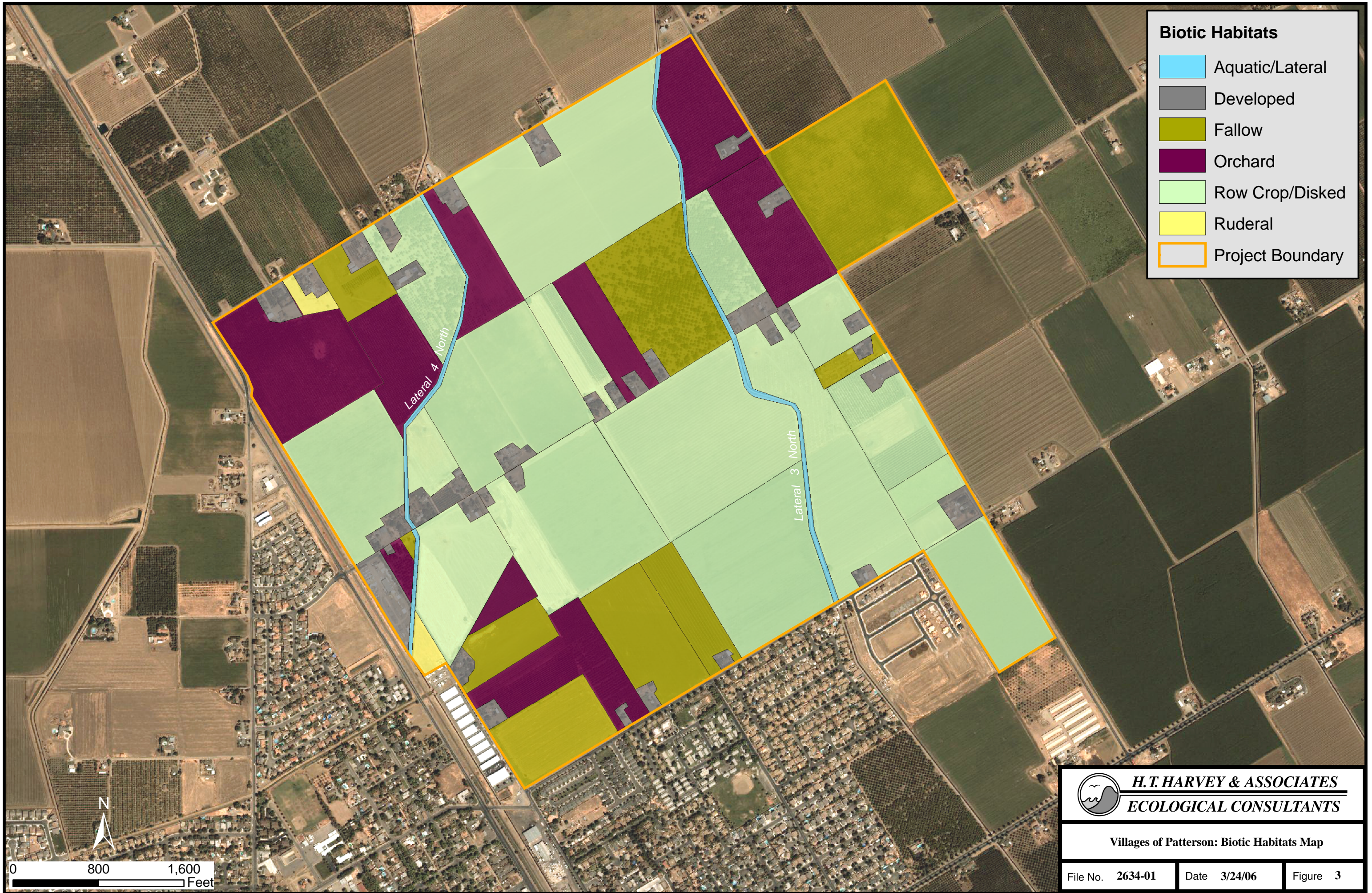
Reconnaissance-level field surveys and a Swainson's Hawk nesting survey of the project site were conducted on 10 March 2006. The purpose of these surveys was to document biotic resources associated with the site that may pose constraints to the proposed development, including nesting Swainson's Hawks. Specifically, surveys were conducted to: 1) describe existing biotic habitats; 2) assess the site for its potential to support special-status species and their habitats; and 3) identify potential jurisdictional habitats, including those regulated by the USACE and CDFG.

BIOTIC HABITATS








Surveys for botanically sensitive habitats were conducted concurrently with special-status plant surveys. Six habitats occur on the project site: irrigated row crops (including disked fields between plantings), orchards, fallow fields, ruderal, aquatic, and developed (Table 2, Figure 3). These biotic habitats and associated vegetation and wildlife are described in further detail below. Plant communities were described in terms of dominant tree, shrub, and herbaceous vegetation composition and, when possible, classified according to the nomenclature of Holland (1986), and Sawyer and Keeler-Wolf (1995). Figure 3 shows the distribution of these habitats and land use types. Appendix A lists the plant species observed on the site.


Table 2. Summary of Biotic Habitats and Land Use Types Present on the Villages of Patterson Project Site.

Habitat type	Acreage	Percent of total
Irrigated Row Crops	383.4	55.4%
Orchard	122.3	17.6%
Fallow Field	123.1	17.7%
Ruderal	8.8	1.3%
Aquatic (Concrete-lined Laterals)	9.4	1.4%
Developed	45.0	6.6%
Totals	692	100%



Biotic Habitats

-  Aquatic/Lateral
-  Developed
-  Fallow
-  Orchard
-  Row Crop/Disked
-  Ruderal
-  Project Boundary

 **H.T. HARVEY & ASSOCIATES**
ECOLOGICAL CONSULTANTS

Villages of Patterson: Biotic Habitats Map

File No. 2634-01	Date 3/24/06	Figure 3
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BIOTIC HABITATS AND EXISTING FACILITIES

IRRIGATED ROW CROPS

Vegetation

Irrigated row crops and disked fields comprise the majority of the project site (383.4 acres [155 ha] or approximately 55.4 percent of the project site). Dominant crops included oats (*Avena sativa*), wheat (*Triticum aestivum*), and alfalfa. Black mustard (*Brassica nigra*) is also found sporadically throughout the fields. These crops are flood-irrigated using water that is diverted from the laterals present on the site to irrigation trenches located on the periphery of the fields.

Wildlife

Because they are less frequently disturbed than other crops, irrigated row crops are used by some wildlife. Species that occur in cultivated habitats are generally widespread species accustomed to disturbances such as American Kestrels (*Falco sparverius*), American Crows (*Corvus brachyrhynchos*), Killdeer (*Charadrius vociferous*), Mourning Doves (*Zenaida macroura*), Western Meadowlarks (*Sturnella neglecta*), Brewer's Blackbirds (*Euphagus cyanocephalus*), and House Finches (*Carpodacus mexicanus*). Alfalfa frequently supports large populations of gophers and voles (*Microtus* sp.), which are prey for raptors such as Red-tailed Hawks (*Buteo jamaicensis*), Swainson's Hawks (*Buteo swainsoni*), and Northern Harriers (*Circus cyaneus*). During irrigation, flocks of American Crows and Great Blue Herons (*Ardea herodias*) are frequently observed feeding on invertebrate life forced to the surface by sheets of water.

ORCHARDS

Vegetation

Developed apricot (*Prunus armeniaca*), black walnut (*Juglans nigra*), English walnut (*Juglans regia*), and almond (*Prunus dulcis*) orchards make up approximately 122.3 acres (49.5 ha) of the project site. The orchards throughout the project site are maintained with few weeds, and consisted primarily of barren soil at the time of the survey.

Wildlife

Orchards provide limited habitats for wildlife, as frequent disturbances associated with crop production such as pruning, spraying, harvesting, watering, and other ground disturbances limit the potential for most wildlife species to persist in these habitats. However, some animals such as the side-blotched lizard (*Uta stansburiana*) persist under these conditions. Birds such as American Crows and Yellow-billed magpies (*Pica nuttalli*) utilize nut crops and can be quite abundant. Burrowing animals such as California ground squirrels (*Spermophilus beecheyi*) and

gophers (*Thomomys sp.*) are normally actively discouraged because of damage these animals can cause to irrigation systems.

FALLOW FIELDS

Vegetation

Fallow fields (previously farmed but not currently planted) comprise approximately 123.1 acres (49.8 ha) of the project site. Although these fields appeared to previously contain oats, wheat, or alfalfa, they were devoid of these crops at the time of the field survey, and contained black mustard and other ruderal, weedy species.

Wildlife

Fallow fields are likely to have larger populations of small mammals such as gophers than actively farmed lands and may be more likely to provide nesting habitat for birds such as Killdeer, Mourning Doves, and Red-winged Blackbirds (*Agelaius phoeniceus*). Raptors also prey upon small mammals within fallow fields.

RUDERAL

Vegetation

Ruderal habitat comprises approximately 8.8 acres (3.5 ha) of the project site. Ruderal communities are assemblages of plants that thrive in disturbed areas, and weedy, non-native annual forbs and grasses are typically the first species to colonize these sites following disturbance. Human-caused disturbances common within, and around, agricultural fields include disking, weed control, and operation of heavy farm equipment. Ruderal species observed on the project site included ripgut brome (*Bromus diandrus*), filaree (*Erodium sp.*), black mustard, shepherd's purse (*Capsella bursa-pastoris*), and yellow star-thistle (*Centaurea solstitialis*).

Wildlife

Ruderal habitats within the project area are of limited value to wildlife due to the lack of vegetative cover. Common species such as Mourning Doves and Killdeer occasionally forage in such areas.

AQUATIC

Aquatic habitat comprises approximately 9.4 acres (3.8 ha) of the project site and occurs only seasonally within the following two laterals: Lateral 4 North, extending from Highway 33 on the western boundary of the project site to Eucalyptus Avenue to the north, and Lateral 3 North, which spans the entire eastern portion of the project site north from Walnut Avenue to Eucalyptus Avenue. Both of the laterals are approximately 8 feet (2.4 m) wide at the top and 6 feet (1.8 m) wide at the bottom. At the time of the survey, the Lateral 4 North did not contain water while Lateral 3 North contained water.

The two laterals on the project site were completely devoid of aquatic vegetation, and recent scraping and clearing of the laterals was evident at the time of the survey. Some hydrophytes (“water-loving” plants) could be present in areas at the terminus of irrigation trenches where ponding may occur as a result of flood-irrigating practices within the project site. However, neither standing water nor hydrophytes were observed within irrigation trenches during the field survey. Because the laterals and the surrounding areas are devoid of vegetation, these areas are of little value for wildlife species. When in use, the laterals may provide a source of drinking water for birds and mammals.

DEVELOPED

Approximately 45.0 acres (18.2 ha) of the project site is comprised of developed areas, including houses and associated hardscape, as well as barns, related structures, and equipment. Many of the ruderal species previously listed occur around these developments. Additionally, a variety of native and ornamental trees including coast live oak (*Quercus agrifolia*), date palm (*Phoenix* sp.), pine (*Pinus* sp.), and eucalyptus (*Eucalyptus* sp.) are present within developed areas.

Homesteads and developed areas typically provide habitat for common species accustomed to human disturbance. Common backyard birds such as Western Scrub-jays (*Aphelocoma californica*), American Robin (*Turdus migratorius*), Northern Mockingbirds (*Mimus polyglottos*), House Finches, and House Sparrows (*Passer domesticus*) are likely to be present at these sites. Where there are wood or brush piles, species such as western fence lizards (*Sceloporus occidentalis*) and desert cottontails (*Sylvilagus audobonii*) may be present.

SPECIAL-STATUS PLANT AND WILDLIFE SPECIES

SPECIAL-STATUS SPECIES REGULATIONS OVERVIEW

Federal and state endangered species legislation gives special status to several plant and animal species known to occur in the vicinity of the project site. In addition, state resource agencies and professional organizations, whose lists are recognized by agencies when reviewing environmental documents, have identified as sensitive some species occurring in the vicinity of the project site. Such species are referred to collectively as “species of special status” and include plants and animals listed, proposed for listing, or candidates for listing as threatened or endangered under the federal Endangered Species Act (ESA) or the California Endangered Species Act (CESA); animals listed as “fully protected” under the California Fish and Game Code; animals designated as “Species of Special Concern” by the CDFG; and plants listed as rare or endangered by the California Native Plant Society (CNPS) in the *Inventory of Rare and Endangered Plants of California* (2001).

ESA provisions protect federally-listed threatened and endangered species and their habitats from unlawful take. Under the ESA, “take” is defined as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any of the specifically enumerated conduct.” The U.S. Fish & Wildlife Service’s (USFWS) regulations define harm to mean “an act which actually kills or injures wildlife.” Such an act “may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering” (50 CFR § 17.3). Activities that may result in “take” of individuals are regulated by the USFWS. The USFWS produced an updated list of candidate species May 11, 2005 (50 CFR Part 17). Candidate species are not afforded any legal protection under ESA; however, candidate species typically receive special attention from federal and state agencies during the environmental review process.

Provisions of CESA protect state-listed threatened and endangered species. CDFG regulates activities that may result in “take” of individuals (*i.e.*, “hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill”). Habitat degradation or modification is not expressly included in the definition of “take” under the California Fish and Game Code. Additionally, the California Fish and Game Code contains lists of vertebrate species designated as “fully protected” (California Fish & Game Code §§ 3511 [birds], 4700 [mammals], 5050 [reptiles and amphibians], 5515 [fish]). Such species may not be taken or possessed.

In addition to federal and state-listed species, the CDFG also has produced a list of Species of Special Concern to serve as a “watch list.” Species on this list are of limited distribution or the extent of their habitats has been reduced substantially, such that threat to their populations may be imminent. Species of Special Concern may receive special attention during environmental review, but they do not have statutory protection. USFWS also uses the label, Species of Concern, as an informal term that refers to those species that might be in need of concentrated conservation actions. Species of Concern receive no legal protection as a result of their designation as Species of Special Concern, and the use of the term does not necessarily mean

that the species will eventually be proposed for listing as a threatened or endangered species. However, most, if not all, of these species are currently protected by state and federal laws.

Raptors (*e.g.*, eagles, hawks, and owls) and their nests are protected under both federal and state regulations. The federal Migratory Bird Treaty Act¹ (MBTA) prohibits killing, possessing, or trading in migratory birds except in accordance with regulations prescribed by the Secretary of the Interior. This act encompasses whole birds, parts of birds, and bird nests and eggs. Birds of prey are protected in California under the State Fish and Game Code.² Section 3503.5 states it is “unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this Code or any regulation adopted pursuant thereto.” Construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment. Disturbance that causes nest abandonment and/or loss of reproductive effort is considered “take” by the CDFG.

Vascular plants listed as rare or endangered by the CNPS, but which might not have designated status under state endangered species legislation, are defined as follows:

- List 1A Plants considered by the CNPS to be extinct in California.
- List 1B Plants rare, threatened, or endangered in California and elsewhere.
- List 2 Plants rare, threatened, or endangered in California, but more numerous elsewhere.
- List 3 Plants about which we need more information – a review list.

SPECIAL-STATUS PLANT SPECIES

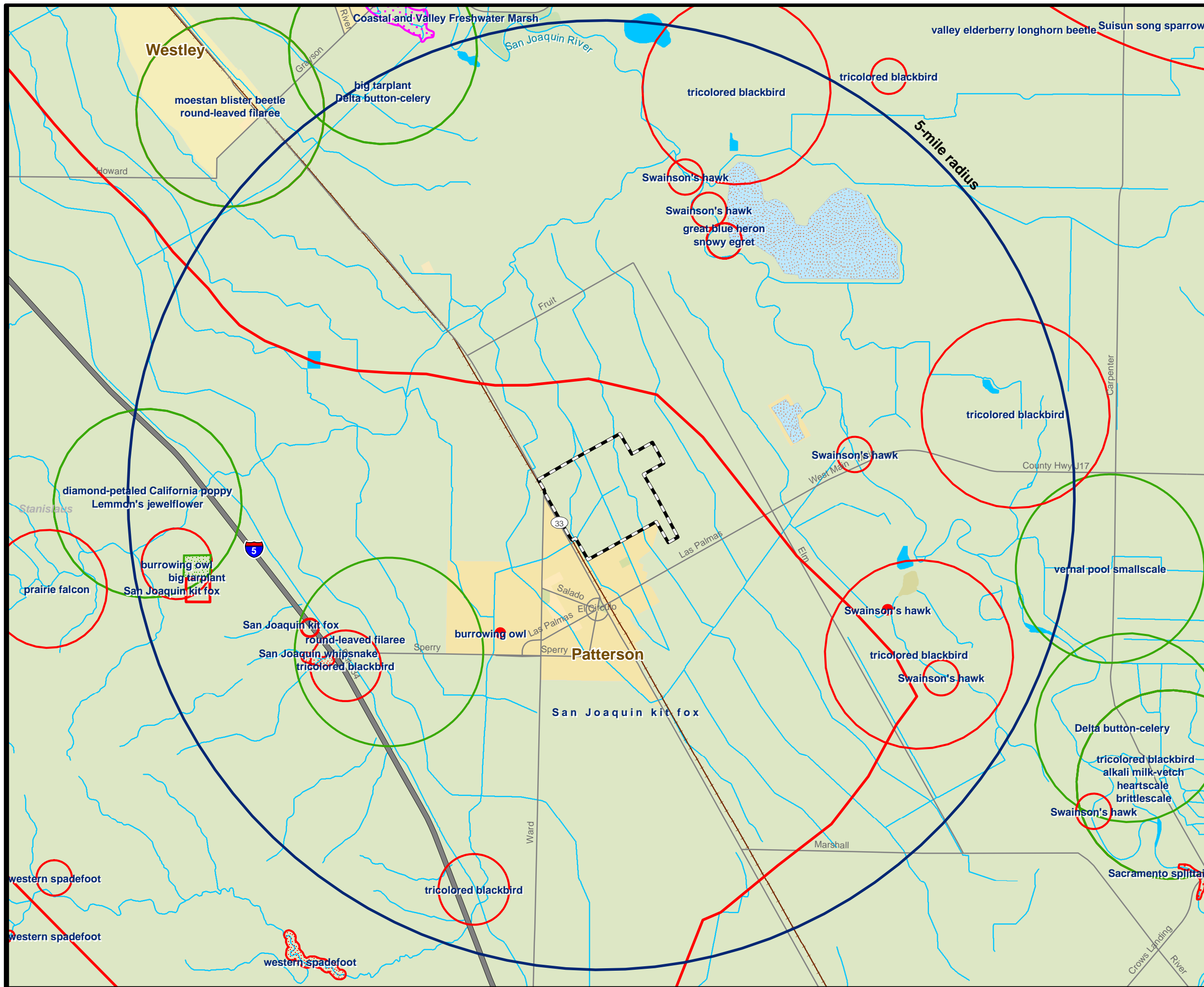
Reconnaissance-level surveys were conducted on 10 March 2006 for habitats capable of supporting special-status plant species. Prior to the site surveys, information concerning the known distribution of threatened, endangered, or other special-status plant species with potential to occur in the area was collected from several sources and reviewed. The sources included the CDFG’s Natural Diversity Database (CNDDDB 2006) and information available through the USFWS, CDFG, and technical publications. The CNPS’s *Inventory of Rare and Endangered Vascular Plants of California* (CNPS 2001) and *The Jepson Manual* (Hickman 1993) supplied information regarding the distribution and habitats of vascular plants in the vicinity.

A query of special-status plants in the CNDDDB was first performed for the USGS Patterson and Crows Landing topographical quadrangles in which the project site occurs, as well as the eight quadrangles surrounding the project site. The CNPS Inventory was then queried to produce a similar list for Stanislaus County. The specific habitat included in the query was valley and foothill grassland. This habitat was chosen based on the similarity of its constituent species to those occurring on the project site. The habitat requirements of each special-status plant species were the principal criteria used for inclusion in the list of species potentially occurring on the site.

¹ 16 U.S.C., Sec. 703, Supp. I, 1989.

² Section 3503.5, 1992.

Many of the special-status plant species that occur in Stanislaus County are associated with habitat or soil types that do not occur on the project site, such as serpentine soils, alkaline soils, clay soils, vernal pool habitat, or cismontane woodland habitat. Twenty-six species associated with valley and foothill grassland habitat were analyzed for rarity, none of which were identified as potentially occurring in the project vicinity. CNDDDB (2006) records list six species as occurring within five miles (8 km) of the project site: round-leaved filaree (*Erodium macrophyllum*), big tarplant (*Blepharizonia plumosa* ssp. *plumosa*), Delta button-celery (*Eryngium racemosum*), diamond-petaled California poppy (*Eschscholzia rhombipetala*), Lemmon's jewelflower (*Caulanthus coulteri* var. *lemmonii*), and vernal pool smallscale (*Atriplex persistens*) (Figure 4). All six of these special-status species were rejected from consideration due to the degraded nature of habitat on the site, the lack of associated native species, and/or the absence of specific microhabitat variables such as soil type, elevation, or hydrology (Appendix B).



CNDDDB Legend

Animals

- Specific Location
- Approximate Location
- General Area

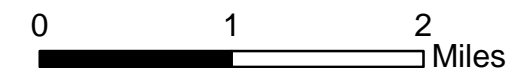
Plants

- Approximate Location
- General Area

Terrestrial Communities

- General Area
- Project Location

Note: This map does not reflect recently developed or developing areas of Patterson Gardens and West Patterson



Villages of Patterson: CNDDDB Map

Table 3. Special-status Plant and Wildlife Species, Their Status, and Potential Occurrence at the Villages of Patterson Project Site.

NAME	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE ON-SITE
Federal or State Endangered or Threatened Species			
Swainson's Hawk <i>Buteo swainsoni</i>	ST	Breeds in stands with few trees in riparian areas, oak savannah, and sometimes in suburban settings. Forages in grassland, pasture, and appropriate agricultural fields.	Presumed Present. There are records of Swainson's Hawks nesting in the vicinity. Foraging habitat exists throughout the project area.
San Joaquin kit fox <i>Vulpes macrotis mutica</i>	FE, ST	Desert alkali scrub, annual grasslands; may forage in adjacent agricultural habitats.	Presumed Absent. Very low potential for occurrence; marginal foraging habitat on agricultural lands; potential dens absent. Surrounded by unsuitable habitat.
California Species of Special Concern			
Northern Harrier <i>Circus cyaneus</i>	CSSC	Forages in marshes, grasslands, and ruderal habitats. Nests in extensive marshes and wet fields.	Present. Observed foraging in pasture habitats during survey.
Burrowing Owl <i>Athene cunicularia</i>	CSSC	Flat grasslands and ruderal habitats. Requires ground squirrel burrows.	Low. Ground squirrel burrows were lacking in open areas. However, the species could occupy site prior to construction if suitable habitat becomes available.
Loggerhead Shrike <i>Lanius ludovicianus</i>	CSSC	Nests in tall shrubs and dense trees, forages in grasslands, marshes, and ruderal habitats.	Present. Observed on site during survey. Suitable nesting and foraging habitat exists on the project site.
Tricolored Blackbird <i>Agelaius tricolor</i>	CSSC	Freshwater Emergent Wetland, Annual grassland, Agriculture, and Valley Foothill Riparian.	Low. Suitable nesting habitat is absent on the site. Species may forage on the site in orchards and within agricultural fields following disking.
State Protected Species or CNPS Species			
Big tarplant <i>Blepharizonia plumosa</i> ssp. <i>plumosa</i>	CNPS 1B	Valley and foothill grassland; elevation 30-505 meters.	Absent. No native habitat on site.
Delta button-celery <i>Eryngium racemosum</i>	CNPS 1B/SE	Riparian scrub (vernally mesic clay depressions); elevation 3-30 meters.	Absent. No riparian scrub or vernal pools present on site.
Diamond-petaled California poppy <i>Eschscholzia rhombipetala</i>	CNPS 1B	Valley and foothill grasslands (alkaline, clay); elevation 0-975 meters.	Absent. No alkaline or clay soils on site.

NAME	STATUS*	HABITAT	POTENTIAL FOR OCCURRENCE ON-SITE
Lemmon's jewelflower <i>Caulanthus coulteri</i> var. <i>lemmonii</i>	CNPS 1B	Pinyon and juniper woodland, valley and foothill grassland; elevation 80-1220 meters.	Absent. No native habitat present on site.
Round-leaved filaree <i>Erodium macrophyllum</i>	CNPS 2	Cismontane woodland, valley and foothill grassland/clay; elevation 15-1200 meters.	Absent. No clay soils present on site.
Vernal pool smallscale <i>Atriplex persistens</i>	CNPS 1B	Vernal pools (alkaline); elevation 10-115 meters.	Absent. No vernal pools on site.

***LISTING STATUS**

- FE = Federally listed Endangered
 FT = Federally listed Threatened
 FD = Federally delisted
 FC = Federal Candidate. Sufficient biological information to support a proposal to list the species as Endangered or Threatened
 SE = State listed Endangered
 ST = State listed Threatened
 CSSC = California Species of Special Concern
 SP = State Protected Species
- CNPS 1B = Plants considered by CNPS to be rare, threatened, or endangered in California, and elsewhere
 CNPS 2 = Plants rare, threatened, or endangered in California, but more numerous elsewhere
 CNPS 3 = Plants about which we need more information - A review list.
 CNPS 4 = Plants of limited distribution

SPECIAL-STATUS WILDLIFE SPECIES

Surveys were conducted on the project site for habitats capable of supporting special-status wildlife species. Prior to the site surveys, information concerning the known distribution of threatened, endangered, or other special-status wildlife species with potential to occur in the area was collected from several sources and reviewed. The sources included the CDFG's Natural Diversity Database (CNDDDB 2006) and information available through the USFWS, CDFG, Museum of Vertebrate Zoology, and California Academy of Sciences.

The CNDDDB was queried for occurrences of special-status wildlife species within the USGS Patterson and Crows Landing topographical quadrangles in which the project site occurs and the eight surrounding quadrangles. The specific habitat requirements and the locations of known occurrences of each special-status wildlife species were the principal criteria used for inclusion in the list of species potentially occurring on the site (Table 3). Eighteen species were rejected from consideration due to lack of suitable aquatic or terrestrial habitat (Appendix B). Expanded descriptions are included for those species for which suitable habitat is available, where specific surveys will be conducted, or where the resource agencies have expressed particular concern.

Federal or State Endangered or Threatened Species

Swainson's Hawk (*Buteo swainsoni*). **Federal Status: None; State Status: Threatened.** The Swainson's Hawk is a large soaring bird of open habitats. Swainson's Hawks are most easily distinguished from other members of its genus, such as the familiar Red-tailed Hawk, by their more slender body and narrow, pointed, and slightly upturned wings.

Swainson's Hawks were once one of the most common birds of prey in the grasslands of California. Its populations have declined at least 90 percent since 1900, and are still believed to be declining (Bloom and Van De Water 1994). They once nested in the majority of the lowland areas in the state. Currently, the nesting range is primarily restricted to portions of the Sacramento and San Joaquin Valleys, and northeast California (Bloom 1980). It was listed as threatened by the State of California in 1983.

Swainson's Hawks require large amounts of foraging habitat, preferably grassland or pasture habitats. Their preferred prey items are voles (*Microtus* spp.), gophers, birds, and insects such as grasshoppers (Estep 1989). They have adapted to the use of some croplands, particularly alfalfa, but also hay, grain, tomatoes, beets and other row crops (Estep 1989). Crops such as cotton, corn, rice, orchards, and vineyards are not suitable because they either lack suitable prey or the prey is unavailable to the Swainson's Hawks due to crop structure.

In the Central Valley, Swainson's Hawks are generally tied to riparian habitat for nesting sites (Bloom 1980). Some pairs utilize eucalyptus trees and nest outside riparian areas (CNDDDB 2005).

In the fall, Swainson's Hawks collect in flocks called kettles, sometimes in large numbers, and migrate together to South America. Kettles can occasionally be seen in the valley foraging behind tractors, hunting mice and insects that have been disrupted.

Land conversion for agricultural purposes in the San Joaquin Valley and the predominance of crops that are unsuitable foraging habitat have led to a loss of suitable habitat patches large enough to sustain Swainson's Hawks. However, there are numerous current and historic records of Swainson's Hawk within ten miles (16 km) of the project site (CNDDDB 2006). Furthermore, an additional CNDDDB record from 1999 exists within 3 miles (4.8 km) of the project site. This record is more than five years old; however, the habitat in the vicinity of the nest appears to be mostly unchanged and remains suitable for Swainson's Hawk. Potential foraging habitat is abundant within the project site within irrigated row crops, disked fields, and fallow lands, and suitable nest locations exist in the vicinity of the project site. Therefore, while the species was not observed during reconnaissance-level surveys, the Swainson's Hawk is presumed present in the project area. Swainson's Hawk nesting surveys are being conducted per the Swainson's Hawk Technical Advisory Committee recommendations to confirm nesting within the project vicinity.

California Species of Special Concern and State Protected Species

Northern Harrier (*Circus cyaneus*). **Federal Status: None; State Status: Species of Special Concern.** Northern Harriers are commonly found in open grasslands, agricultural areas, and marshes. Northern Harriers nest on the ground in areas where long grasses or marsh plants provide cover and protection. Harriers hunt for a variety of prey, including rodents, birds, frogs, reptiles, and insects, by flying low and slow in a traversing manner, utilizing both sight and sound to detect prey items.

Northern Harriers were observed foraging in the project vicinity during the field survey on 10 March 2006. While nesting habitat is absent from the project site, suitable foraging habitat exists throughout the area.

Burrowing Owl (*Athene cunicularia*). **Federal Status: None; State Status: Species of Special Concern.** The Burrowing Owl is a small, terrestrial owl of open country. Burrowing Owls favor flat, open grassland or gentle slopes and sparse-shrub land ecosystems. These owls prefer annual and perennial grasslands, typically with sparse or nonexistent tree or shrub canopies. In California, Burrowing Owls are found in close association with California ground squirrels. Owls use the abandoned burrows of ground squirrels for shelter and nesting.

Burrowing Owls are known to be resident within the southern San Joaquin Valley. They are likely to inhabit pastures, fallow fields, and canal and railway right-of-ways where ground squirrels have been allowed to invade. No Burrowing Owls or signs of their presence, such as feathers, droppings, pellets, or prey remains, were observed on the project site during the reconnaissance-level survey. However, habitat characteristics within fallow fields and some ruderal habitats within the project site may become suitable for Burrowing Owls prior to construction. Therefore, the species could occur on the project site.

Loggerhead Shrike (*Lanius ludovicianus*). **Federal Status: None; State Status: Species of Special Concern.** This predatory songbird inhabits much of the lower 48 states of the United States of America. They prefer open habitats interspersed with shrubs, trees, poles, fences or other perches from which they can hunt. Some populations of the Loggerhead Shrike, primarily those in eastern North America, have declined significantly over the last 40 years. Other populations, including those in western North America, appear to be decreasing as well. Even with this trend, Loggerhead Shrikes are still considered a fairly common species in California. Though they are likely to be more common in less disturbed habitats, Loggerhead Shrikes are still found throughout the Central Valley.

A Loggerhead Shrike was observed on the project site during the survey. Suitable nesting and foraging habitat exists on the project site at the edge of orchards and in some vegetation associated with the residences.

Tricolored Blackbird (*Agelaius tricolor*). **Federal Status: None; State Status: Species of Special Concern.** Tricolored Blackbirds are found almost exclusively in the Central Valley and central and southern coastal areas of California. The Tricolored Blackbird is highly colonial in its nesting habits and forms dense breeding colonies of up to tens of thousands of pairs. This species nests primarily in tall, dense stands of cattails or tules, but also nests in blackberry, wild rose bushes and tall herbs. Nesting colonies are typically located near standing or flowing freshwater. Tricolored Blackbirds form large, often multi-species, flocks during the non-breeding period and range more widely than during the reproductive season.

Nesting habitat for Tricolored Blackbirds is absent from the project area. Tricolored Blackbirds are known from the project vicinity (CNDDDB 2005) and are likely to occasionally forage in agricultural habitats on the project site such as orchards, alfalfa fields, and recently disked fields.

REGULATED HABITATS

UNITED STATES ARMY CORPS OF ENGINEERS JURISDICTION

Regulatory Overview

Areas meeting the regulatory definition of “Waters of the U.S.” (jurisdictional waters) are subject to the jurisdiction of the USACE under provisions of Section 404 of the Clean Water Act (1972) and Section 10 of the Rivers and Harbors Act (1899). These waters may include all waters used, or potentially used, for interstate commerce, including all waters subject to the ebb and flow of the tide, all interstate waters, all other waters (intrastate lakes, rivers, streams, mudflats, sandflats, playa lakes, natural ponds, etc.), all impoundments of waters otherwise defined as “Waters of the U.S.,” tributaries of waters otherwise defined as “Waters of the U.S.,” the territorial seas, and wetlands (termed Special Aquatic Sites) adjacent to “Waters of the U.S.” (33 CFR, Part 328, Section 328.3). Wetlands on non-agricultural lands are identified using the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987).

Construction activities within jurisdictional waters are regulated by the USACE. The placement of fill into such waters must comply with permit requirements of the USACE. No USACE permit will be effective in the absence of state water quality certification pursuant to Section 401 of the Clean Water Act. The State Water Resources Control Board is the state agency (together with the Regional Water Quality Control Boards) charged with implementing water quality certification in California.

Survey Results

Field surveys for jurisdictional waters on the project site were conducted in accordance with USACE regulations and guidelines on 10 March 2006. Lateral 3 North and Lateral 4 North, are both agricultural features excavated on dry land that are controlled by the Patterson Irrigation District who have maintained water rights since approximately 1914 (CALFED 2002). Each lateral is concrete-lined, cleared of debris on an annual basis, and remains dry up to 7 months of each year (Pers. Comm. John Sweigard). The water in each lateral originates from the Main Canal located approximately 6,000 feet (1,829 m) south of the project site. Water in the Main Canal is pumped from the San Joaquin River approximately 30 feet (9 m) upwards to the Main Canal. From there, the water is gravity-fed to each of the laterals (flow into the laterals is gate-controlled) and travels north through the project site, emptying into Del Puerto Creek approximately 11,500 feet (3,505 m) north of the project site. Del Puerto Creek then flows into the San Joaquin River. Lateral 4 North enters a culvert and empties into a dense thicket of blackberry (*Rubus discolor*) approximately 5 feet (1.5 m) above Del Puerto Creek. Lateral 3 North appears to terminate approximately 100 feet (30 m) from Del Puerto Creek on the USGS map. However, during the reconnaissance-level survey of this area, it was determined that the water enters an earthen lateral at this point, turns east, and travels approximately 1,500 additional feet (457 m) before operationally spilling into Del Puerto Creek on the south side of the creek bank. The Patterson Irrigation District maintains these laterals, clearing them yearly of debris

and sedimentation. The laterals are primarily dry from November through February of each year, and usually remain dry for most of October and March of each year.

Based upon prior experience with similar features and upon field characteristics encountered on the project site, including information obtained from staff of the Patterson Irrigation District, we believe that the laterals occurring on the site do not represent habitats within the regulatory jurisdiction of the USACE.

CALIFORNIA DEPARTMENT OF FISH AND GAME JURISDICTION

Regulatory Overview

The CDFG potentially extends the definition of stream to include “intermittent and ephemeral streams, rivers, creeks, dry washes, sloughs, blue-line streams (USGS), and watercourses with subsurface flows. Canals, aqueducts, irrigation ditches, and other means of water conveyance can also be considered streams if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife” (CDFG 1994). Such areas on the site were determined using methodology described in *A Field Guide to Lake and Streambed Alteration Agreements, Sections 1600-1607* (CDFG 1994).

Activities that result in the diversion or obstruction of the natural flow of a stream, or which substantially change its bed, channel or bank, or which utilize any materials (including vegetation) from the streambed, may require that the project applicant enter into a Streambed Alteration Agreement with the CDFG.

Survey Results

Field surveys were also conducted within the Villages of Patterson project area for streams and other waterways potentially under the regulatory jurisdiction of the CDFG. Given the current use and maintenance of both laterals found within the project boundaries, and its lack of vegetative cover, it is our opinion that the CDFG would not assert jurisdiction over these waterways or require mitigation for placing both laterals into pipes underground.

ENVIRONMENTAL IMPACTS

SIGNIFICANCE CRITERIA

The proposed project will have a number of effects on the biological resources of the project site. The California Environmental Quality Act (CEQA) defines “significant effect on the environment” as “a substantial, or potentially substantial, adverse change in the environment” (Pub. Res. Code, §21068). Under CEQA Guidelines Section 15065, a project's effects on biotic resources are deemed significant where the project would:

- substantially reduce the habitat of a fish or wildlife species,
- cause a fish or wildlife population to drop below self-sustaining levels,
- threaten to eliminate a plant or animal community, and/or
- reduce the number or restrict the range of a rare or endangered plant or animal.

In addition to the Section 15065 criteria, Appendix G within the CEQA Guidelines lists other potential impacts to consider when analyzing the effects of a project. The following are applicable to the assessment of impacts stemming from the proposed project:

- Would the project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS?
- Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the CDFG or USFWS?
- Would the project have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?
- Would the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?
- Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preserve policy or ordinance?
- Would the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

IMPACTS FOUND TO BE LESS THAN SIGNIFICANT

Loss of Aquatic Habitat within Concrete-Lined Laterals

Development of the Villages of Patterson project site would result in the permanent loss of approximately 9.4 acres (3.8 ha) of exposed aquatic habitat in the concrete-lined laterals. As previously described, these canals are artificially created irrigation ditches used for the conveyance of irrigation water. Neither lateral contained any vegetation at the time of the survey. Neither appears to be a jurisdictional Water of the U.S., subject to Corps of Engineers jurisdiction, nor do they come under the Section 1600 provisions of the Fish & Game Code, administered by the CDFG. Impacts associated converting the exposed canals to closed conveyance features are therefore considered to be less than significant.

Loss of Orchard, Ruderal, and Developed Habitats

Orchards, ruderal, and developed habitats predominately support common plant and wildlife species. These habitats are locally common, the plant species present within these areas are regionally common, and the majority of biotic resources associated with these habitats will continue to be abundant following the build-out of the Villages of Patterson project area. Loss of these habitats would not result in significant impacts to biological resources.

Loss of Foraging Habitat for Northern Harriers and Tricolored Blackbird

Irrigated row crops and disked fields within which Northern Harriers and Tricolored Blackbirds may forage are regionally abundant. Project implementation will not substantially reduce the foraging habitat available for these species, restrict their range, or cause their regional populations to drop below a self-sustaining level. Therefore, impacts to these species stemming from a loss of foraging habitat would be less than significant.

Loss of Nesting and Foraging Habitat for Loggerhead Shrikes

Loggerhead Shrikes were observed during the reconnaissance-level survey and could nest within the project site. Similar potential breeding and foraging habitat for Loggerhead Shrikes associated with agricultural operations and developed areas are regionally abundant. Project implementation will not substantially reduce the foraging habitat available for these species, restrict their range, or cause their regional populations to drop below a self-sustaining level. Therefore, impacts to this species would be less than significant.

SIGNIFICANT IMPACTS THAT CAN BE MITIGATED TO A LESS THAN SIGNIFICANT LEVEL

Loss of Occupied Burrowing Owl Habitat

No Burrowing Owls or signs of their presence, such as feathers, droppings, pellets, or prey remains, were observed in the project area during the survey. The project site does not currently provide suitable Burrowing Owl habitat because there are no ground squirrel burrows or other suitable burrows in, or adjacent to, the open areas of the project site. There is evidence that ground squirrels are actively prevented from establishing burrow systems by on-going farming practices on the site. Should active farming of the site cease prior to the beginning of the project, ground squirrels could become established on the project site and provide habitat for Burrowing Owls.

If Burrowing Owls are present within a construction zone, or adjacent to such an area, at the time of construction, disturbance could destroy occupied burrows or cause owls to abandon burrows. Construction during the breeding season could result in the incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment. The loss of occupied Burrowing Owl habitat (habitat known to have been occupied by owls during the nesting season within the past 3 years) or reductions in the number of this rare species within Stanislaus County, directly or indirectly through nest abandonment or reproductive suppression, would constitute a significant impact. Furthermore, raptors, including owls and their nests, are protected under both federal and state laws and regulations, including the Migratory Bird Treaty Act and California Fish and Game Code section 3503.5 (see “Disturbance of Nesting Raptors” below). Implementation of the following mitigation measures would reduce the potential impact on this species to a less than significant level.

Mitigation 1. Implement CDFG Protocol. In conformance with federal and state regulations regarding the protection of raptors, a habitat assessment in accordance with CDFG protocol for Burrowing Owls should be completed prior to the start of construction. Burrowing Owl habitat on the project site and within a 500-foot (150 m) buffer zone should be assessed (“Assessment Area”). If the habitat assessment concludes that the Assessment Area lacks suitable Burrowing Owl habitat, no additional action would be warranted. However, if suitable habitat is located on the Assessment Area, all ground squirrel colonies should be mapped at an appropriate scale, and the following mitigation measures should be implemented:

1. In conformance with federal and state regulations regarding the protection of raptors, a pre-construction survey for Burrowing Owls, in conformance with CDFG protocol, should be completed no more than 30 days prior to the start of construction within suitable habitat at the project site(s) and buffer zone(s). Three additional protocol-level surveys should also be completed per CDFG protocol prior to construction.

2. Occupied burrows should not be disturbed during the nesting season (February 1 through August 31) unless a qualified biologist approved by CDFG verifies through non-invasive methods that either: 1) the birds have not begun egg – laying and incubation; or 2) that juveniles from the occupied burrows are foraging independently and are capable of independent survival. Eviction outside the nesting season may be permitted pending evaluation of eviction plans and receipt of formal written approval from the CDFG authorizing the eviction.
3. A 250-foot (76 m) buffer, within which no new activity will be permissible, will be maintained between project activities and nesting Burrowing Owls during the nesting season. This protected area will remain in effect until August 31, or at the CDFG’s discretion and based upon monitoring evidence, until the young owls are foraging independently.
4. If accidental take (disturbance, injury, or death of owls) occurs, the CDFG will be notified immediately.

Mitigation 2. Compensation for loss of Burrowing Owl habitat. If preconstruction surveys determine that Burrowing Owls occupy the site and avoiding development of occupied areas is not feasible, then habitat compensation on off-site mitigation lands should be implemented. Habitat Management (HM) lands comprising existing Burrowing Owl foraging and breeding habitat should be acquired and preserved. An area of 6.5 acres (2.6 ha) (the amount of land found to be necessary to sustain a pair or individual owl) should be secured for each pair of owls, or individual in the case of an odd number of birds. As part of an agreement with the CDFG, the project applicant should secure the performance of its mitigation duties by providing the CDFG with security in the form of funds that would:

- Allow for the acquisition and/or preservation of 6.5 acres (2.6 ha) of HM lands;
- Provide initial protection and enhancement activities on the HM lands, potentially including, but not limited to, such measures as fencing, trash clean-up, artificial burrow creation, grazing or mowing, and any habitat restoration deemed necessary by CDFG;
- Establish an endowment for the long-term management of the HM lands, and;
- Reimburse the CDFG for reasonable expenses incurred as a result of the approval and implementation of this agreement.

Pending CDFG approval, HM lands providing foraging habitat for Swainson’s Hawks (see “Loss of Swainson’s Hawk Foraging Habitat” below) may also be used to mitigate impacts to Burrowing Owls provided the HM lands provide existing Burrowing Owl foraging and breeding habitat.

Disturbance of Nesting Swainson's Hawks

Construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment. Disturbance that causes Swainson's Hawks to abandon their nest and/or results in the loss of reproductive effort comprises a significant impact. Implementation of the following mitigation measure would reduce the potential impact from nest disturbance to a less than significant level.

Mitigation 1. Pre-construction surveys. In order to assure that nesting Swainson's Hawks will not be disturbed by construction activities, a qualified ornithologist shall conduct pre-construction surveys of the project site and adjacent areas within one mile of the project site. Survey Period I occurs from January 1 to March 20, Period II from March 20 to April 5, Period III from April 5 to April 20, Period IV from April 21 to June 10 (surveys not recommend during this period because identification is difficult as the adults tend to remain within the nest for longer periods of time), and Period V from June 10 to July 30. No fewer than three surveys shall be completed, in at least each of the two survey periods immediately prior to project initiation. If a nest site is found, consultation with CDFG shall be required to ensure project initiation will not result in nest disturbance (see Mitigation 2).

Mitigation 2. Removal of Nest Trees. Nest trees on the project site(s) should not be removed unless avoidance measures are determined to be infeasible. If a nest tree must be removed, a Management Authorization (including conditions to off-set the loss of the nest tree) must be obtained. The Management Authorization will specify the tree removal period, generally between October 1 – February 1. If construction or other project related activities which may cause nest abandonment or forced fledging are necessary within the buffer zone, monitoring of the nest site (funded by the developer) by a qualified biologist should be required to determine if the nest is abandoned. If it is abandoned, and if the nestlings are still alive, the developer shall fund the recovery and hacking (controlled release of captive reared young) of nestling(s).

Loss of Swainson's Hawk Foraging Habitat

Foraging habitat for Swainson's Hawks includes: dry-land and irrigated pasture, alfalfa, fallow fields, low-growing row or field crops, rice land, and cereal grain crops (CDFG 1994b). The project site contains approximately 506.5 acres (205 ha) of suitable foraging habitat for Swainson's Hawks and is within ten miles of known active Swainson's Hawk nests. Nesting season surveys are currently being conducted to confirm the location of the nearest active nest.

Project implementation would result in the loss of this foraging habitat and represent a significant adverse effect to this state-threatened species through habitat modification. Implementation of the following mitigation measures would reduce the potential impact on this species to a less than significant level.

Mitigation 1. Compensation for loss of foraging habitat. Loss of foraging habitat for Swainson's Hawks should be mitigated by providing offsite Habitat Management (HM) lands as described in the CDFG's *Staff Report regarding Mitigation for Impacts to Swainson's Hawks (Buteo swainsoni) in the Central Valley of California* (CDFG 1994b) because the site is known foraging habitat for Swainson's Hawks.

The final acreage of offsite management lands to be provided will depend on the distance between the project area and the nearest active nest site (CDFG 1994b), as determined by protocol-level nest surveys currently being conducted. The acreage of offsite Habitat Management (HM) lands provided should be derived from the following recommendations included in the 1994 CDFG staff report:

(a) Projects within one mile of an active nest tree shall provide:

- One acre of HM land (at least 10% of the HM land requirements shall be met by fee title acquisition or a conservation easement allowing for the active management of the habitat, with the remaining 90% of the HM lands protected by a conservation easement [acceptable to the Department] on agricultural lands or other suitable habitats that provide foraging habitat for Swainson's Hawk) for each acre of development authorized (1:1 ratio); or
- One-half acre of HM land (all of the HM land requirements shall be met by fee title acquisition or a conservation easement [acceptable to the Department] which allows for the active management of the habitat for prey production on the HM lands) for each acre of development authorized (0.5:1 ratio).

(b) Projects within 5 miles of an active nest tree but greater than 1 mile from the nest tree shall provide 0.75 acres of HM land for each acre of urban development authorized (0.75:1 ratio). All HM lands protected under this requirement may be protected through fee title acquisition or conservation easement (acceptable to the department) on agricultural lands or other suitable habitats that provide foraging habitat for Swainson's Hawks.

(c) Projects within 10 miles of an active nest tree but greater than 5 miles from an active nest tree shall provide 0.5 acres of HM land for each acre of urban development authorized (0.5:1 ratio). All HM lands protected under this requirement may be protected through fee title acquisition or conservation easement (acceptable to the Department) on agricultural lands or other suitable habitats that provide foraging habitat for Swainson's Hawks.

Management Authorization holders/project sponsors shall provide for the long-term management of the HM lands by funding a management endowment (the interest on which shall be used for managing the HM lands).

CUMULATIVE IMPACTS

Cumulative Loss of Swainson's Hawk Foraging Habitat

The loss of foraging habitat due to agricultural and urban expansion has greatly reduced the breeding range and abundance of Swainson's Hawks in California. Patterson is expected, and planned to, accommodate a substantial share of Stanislaus County's projected population growth. Development in the Patterson area including the project area and projects analyzed in the West Patterson EIR (City of Patterson 2003) would contribute to the conversion of substantial contiguous areas of agricultural lands in the Patterson area.

Conversion of approximately 506.5 acres (205 ha) of suitable Swainson's Hawk foraging habitat within the project area would result in significant contribution to cumulative impacts to Swainson's Hawks. However, the mitigation measures described above would reduce these cumulative impacts to less than significant levels.

INDIRECT IMPACTS

The proposed project has the potential to degrade water quality within both laterals, within the reaches north of the project site, and Del Puerto Creek at their terminus as a result of pollution, sedimentation, and litter stemming from site construction. These factors could result in significant indirect effects to downstream biological resources.

The project, however, must comply with state and federal water quality regulations, including California's General Construction Stormwater Permit, which requires preparation and implementation of a Stormwater Pollution Prevention Plan (SWPPP). SWPPPs are designed to manage stormwater quality degradation through best management practices during and after construction. These practices may include temporary drainage ditches, culverts, berms, and/or straw bales that confine stormwater and prevent it from carrying sedimentation off of the project site. Compliance with the SWPPP will reduce the potential for indirect impacts to biological resources to less than significant levels.

UNAVOIDABLE SIGNIFICANT ADVERSE IMPACTS

No unavoidable significant adverse impacts on biological resources would occur from implementing the proposed project.

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Persons Contacted:

John Sweigard, General Manager
Patterson Irrigation District

APPENDIX A.

PLANT SPECIES OBSERVED ON THE VILLAGES OF PATTERSON PROJECT SITE

PLANT SPECIES IDENTIFIED ON THE VILLAGES OF PATTERSON PROJECT SITE

FAMILY NAME	SCIENTIFIC NAME	COMMON NAME
Arecaceae	<i>Phoenix</i> sp.	date palm
Asteraceae	<i>Centaurea solstitialis</i>	yellow star-thistle
	<i>Senecio</i> sp.	groundsel
Boraginaceae	<i>Amsinckia menziesii</i>	fiddleneck
Brassicaceae	<i>Brassica nigra</i>	black mustard
	<i>Capsella bursa-pastoris</i>	Shepherd's purse
	<i>Hirschfeldia incana</i>	small pod mustard
	<i>Raphanus sativus</i>	wild radish
Convolvulaceae	<i>Convolvulus arvensis</i>	field bindweed
Fabaceae	<i>Medicago sativa</i>	alfalfa
Fagaceae	<i>Quercus agrifolia</i>	coast live oak
Geraniaceae	<i>Erodium</i> sp.	filaree
Juglandaceae	<i>Juglans nigra</i>	black walnut
	<i>Juglans regia</i>	English walnut
Myrtaceae	<i>Eucalyptus globulus</i>	blue gum
	<i>Eucalyptus</i> sp.	eucalyptus
Pinaceae	<i>Pinus</i> sp.	pine
Poaceae	<i>Avena sativa</i>	cultivated oat
	<i>Bromus carinatus</i> var. <i>carinatus</i>	California brome
	<i>Bromus diandrus</i>	ripgut brome
	<i>Hordeum leporinum</i>	wall barley
	<i>Lolium multiflorum</i>	Italian ryegrass
	<i>Phalaris paradoxa</i>	paradox canary grass
	<i>Tritium aestivum</i>	cultivated wheat
Rosaceae	<i>Prunus dulcis</i>	almond
	<i>Prunus armeniaca</i>	apricot

The species are arranged alphabetically by family name for all vascular plants encountered during the plant survey. Plants are also listed alphabetically within each family. In some cases, it was not possible to accurately identify a particular plant to the species level due to the absence of specific anatomic structures required for identification.

APPENDIX B.

**SPECIAL-STATUS PLANT AND WILDLIFE SPECIES CONSIDERED BUT
REJECTED FOR OCCURRENCE AT THE PROJECT SITE**

**SPECIAL-STATUS PLANT SPECIES CONSIDERED BUT REJECTED FOR OCCURRENCE
ON THE VILLAGES OF PATTERSON PROJECT SITE**

Scientific Name	Common Name	Lack of Serpentine Soils	Lack of Strongly Alkaline Soils	Specific Edaphic Requirements Lacking	Outside the Elevation Range	Lack of Associate Species	Believed to Be Extirpated or Extinct	Highly Degraded Site Conditions
<i>Astragalus tener</i> var. <i>tener</i>	alkali milk-vetch		X					
<i>Atriplex cordulata</i>	heartscale		X					
<i>Atriplex coronata</i> var. <i>coronata</i>	crownscale		X					
<i>Atriplex depressa</i>	brittlescale		X					
<i>Blepharizonia plumosa</i> ssp. <i>plumosa</i>	big tarplant			X				
<i>Calochortus umbellatus</i>	Oakland star-tulip	X						
<i>Calycadenia hooveri</i>	Hoover's calycadenia				X			
<i>Caulanthus coulteri</i> var. <i>lemmonii</i>	Lemmon's jewelflower			X				
<i>Cirsium fontinale</i> var. <i>campylon</i>	Mount Hamilton thistle	X						
<i>Clarkia rostrata</i>	beaked clarkia				X			
<i>Convolvulus simulans</i>	small-flowered morning-glory	X						
<i>Cryptantha hooveri</i>	Hoover's cryptantha			X				
<i>Delphinium gypsophilum</i> ssp. <i>gypsophilum</i>	gypsum-loving larkspur				X			
<i>Downingia pusilla</i>	dwarf downingia			X				
<i>Erodium macrophyllum</i>	round-leaved filaree					X		X
<i>Eryngium spinosepalum</i>	spiny-sepaled button-celery				X			
<i>Eschscholzia rhombipetala</i>	diamond-petaled California poppy					X		X
<i>Fritillaria agrestis</i>	stinkbells			X				
<i>Hesperervax caulescens</i>	hogwallow starfish			X				
<i>Linanthus ambiguus</i>	serpentine linanthus	X						
<i>Lotus rubriflorus</i>	red-flowered lotus				X			
<i>Microseris sylvatica</i>	sylvan microseris	X						
<i>Monardella leucocephala</i>	Merced monardella							X
<i>Myosurus minimus</i> ssp. <i>apus</i>	little mousetail		X					
<i>Ophioglossum californicum</i>	California adder's-tongue				X			
<i>Pseudobahia bahifolia</i>	Hartweg's golden sunburst			X				

SPECIAL-STATUS WILDLIFE SPECIES CONSIDERED BUT REJECTED FOR OCCURRENCE ON THE VILLAGES OF PATTERSON PROJECT SITE

Scientific Name	Common Name	Outside of known current range	Lack of suitable aquatic habitat	Lack of suitable terrestrial habitat
<i>Branchinecta lynchi</i>	Conservancy fairy shrimp		X	
<i>Branchinecta longiantenna</i>	Longhorn fairy shrimp		X	
<i>Branchinecta lynchi</i>	Vernal pool fairy shrimp		X	
<i>Desmocerus californicus dimorphus</i>	Valley elderberry beetle		X	
<i>Ambystoma californiense</i>	California tiger salamander		X	
<i>Rana aurora draytonii</i>	California red-legged frog		X	
<i>Thamnophis gigas</i>	Giant garter snake		X	
<i>Linderiella occidentalis</i>	California linderiella		X	
<i>Lavinia symmetricus</i> ssp 1	San Joaquin roach		X	
<i>Pogonichthys macrolepidotus</i>	Sacramento splittail		X	
<i>Scaphiopus hammondii</i>	Western spadefoot		X	
<i>Clemmys marmorata</i>	Western pond turtle		X	
<i>Masticophis flagellum ruddocki</i>	San Joaquin whipsnake	X		X
<i>Aquila chrysaetos</i>	Golden Eagle			X
<i>Falco mexicanus</i>	Prairie Falcon			X
<i>Branta hutchinsii leucopareia</i>	Aleutian Cackling Goose			X
<i>Melospiza melodia maxillaris</i>	Suisun Song Sparrow			X
<i>Taxidea taxus</i>	Badger	X		X

**APPENDIX D: ENVIRONMENTAL SITE ASSESSMENTS,
PHASE I**

Note: Appendices to the reports in this Appendix D to the EIR are not reproduced here. They are available for review at the City of Patterson Community Development Department (City Hall, 1 Plaza, Patterson, CA 95363) as part of the project file.

PHASE I ENVIRONMENTAL SITE ASSESSMENT
FOR THE
VILLAGES OF PATTERSON PROJECT

May 2006

Prepared by:

Brown and Caldwell
10540 White Rock Road, Suite 180
Rancho Cordova, CA 95670

Prepared for:

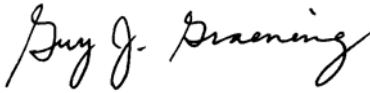
Terra Firma Entitlement Company
11 Plaza, Suite G
Patterson, CA 95363

Signatures of principal personnel responsible for development and execution of the Phase I Environmental Site Assessment for the Village of Patterson Project Report.

Approved:



James E. Smith
Project Manager



Guy Graening, P.E. #M29796
Technical Manager



G. O. Graening, Ph.D., R.E.A. I #8060
Registered Environmental Assessor

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- B-2 GeoTracker Database Query
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- E-1 Mail and E-mail Transcripts
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ACRONYMS AND ABBREVIATIONS

AB	California Assembly Bill
APN	Assessor's Parcel Number
AST	Aboveground Storage Tank
ASTM	American Society of Testing and Materials
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act (Federal Superfund)
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CVRWQCB	Central Valley Regional Water Quality Control Board
DER	Stanislaus County Department of Environmental Resources
DTSC	California Department of Toxic Substances Control
DWR	California Department of Water Resources
EDR	Environmental Data Resources, Incorporated
ESA	Environmental Site Assessment
FUDS	Formerly Used Defense Sites (Department of Defense)
GEIMS	Geographic Environmental Information System
GIS	Geographic Information System
HAZMAT	Hazardous Material
LUFT	Leaking Underground Fuel Tank
LUST	Leaking Underground Storage Tank
MTBE	Methyl-Tertiary Butyl Ether
NPL	National Priorities List (Superfund List)
OVP	Standard Oil's Old Valley Pipeline
PCB	Polychlorinated Biphenyl Compound
PG&E	Pacific Gas and Electric Company
PRC	Petroleum Recycling Corporation
RCRA	Federal Resource Conservation and Recovery Act (hazardous and solid waste)
REA	California Registered Environmental Assessor
REHS	Registered Environmental Health Specialist

ACRONYMS AND ABBREVIATIONS (continued)

SB	California Senate Bill
SLIC	California Spills, Leaks, Investigations, and Cleanups Program
SPRR	Southern Pacific Railroad Company (acquired by UPRR in 1990's)
SWEEPS	Statewide Environmental Evaluation and Planning System
SWRCB	California State Water Resources Control Board
TSCA	Toxic Substances Control Act
UPRR	Union Pacific Railroad Company
USC	United States Code (statute)
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
USPS	United States Postal Service
UST	Underground Storage Tank
VOP	Villages of Patterson
WDR	Waste Discharge Report

Please note that specific database acronyms used by EDR are listed with the tables in the body of the report.

1.0 SUMMARY

This report presents the findings of a Phase I Environmental Site Assessment (ESA) for the Study Area of the proposed Villages of Patterson Development Project (VOP) located near Patterson, California. Brown and Caldwell, in partnership with Natural Investigations Company, has performed this Phase I ESA in conformance with the scope and limitations of the American Society for Testing and Materials (ASTM) Practice E 1527 and in accordance with the prevailing standard of care for completing such assessments in California at this time. Exceptions to, or deletions from, this practice are described in Section 11.0 of this report. This assessment has revealed no evidence of recognized environmental conditions in connection with the Study Area except for the following:

- Current recognized environmental conditions – the potential for soil contamination by the Chevron Old Valley Pipeline, the likely existence of improperly abandoned aboveground storage tanks (ASTs) and underground storage tanks (USTs) and possible petroleum product contamination, the likely presence of residual pesticides and/or heavy metals, especially in pesticide handling areas of farm operations, and the possible presence of contaminants from drum storage and refuse disposal.
- Historic recognized environmental conditions – the Petroleum Recycling Corporation Superfund Site.
- *De minimis* recognized environmental conditions - the presence of refuse piles, the current registered use and storage of hazardous substances, petroleum products, pesticides, and the existence of groundwater wells and septic systems.

As discussed in Section 9.0 of this report, further investigation into the current recognized environmental conditions identified in this assessment is recommended. This summary should only be read in conjunction with the full text of the report. The scope of work, significant assumptions, limitations, and exceptions should be understood prior to reading the Site-specific information, findings, opinions, and conclusions.

2.0 INTRODUCTION

2.1 Purpose

The ASTM (2000) defines the purpose of the ESA as follows:

The purpose of this Phase I Environmental Site Assessment is to identify, to the extent feasible pursuant to the processes prescribed herein, recognized environmental conditions in connection with the property.

The purpose of this practice, as well as Practice E 1528, is to define good commercial and customary practice in the United States for conducting an environmental site assessment of a parcel of commercial real estate with respect to the range of contaminants within the scope of Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and petroleum products. As such, this practice is intended to permit a user to satisfy one of the requirements to qualify for the innocent landowner defense to CERCLA liability; that is, the practices that constitute 'all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice' as defined in 42 USC § 9601(35)(B). An evaluation of business environmental risk associated with a parcel of commercial real estate may necessitate investigation beyond that identified in this practice. (page 1, ASTM, 2000)

2.2 Detailed Scope of Services

The ASTM (2000) describes the following general scope of services in a Phase I ESA:

A Phase I Environmental Site Assessment shall have four components: records review; site reconnaissance; interviews; and report. (page 1, ASTM, 2000)

In defining a standard of good commercial and customary practice for conducting an environmental site assessment of a parcel of a property, the goal of the processes established by this practice is to identify recognized environmental conditions. The term recognized environmental conditions means the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, ground water, or surface water of the property. The term includes hazardous substances or petroleum products even under conditions in compliance with laws. The term is not intended to include de minimis conditions that generally do not present a material risk of harm to public health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. (page 1, ASTM, 2000)

The scope of this practice includes research and reporting requirements that support the user's ability to qualify for the innocent landowner defense. As such, sufficient documentation of all sources, records, and resources utilized in conducting the inquiry required by this practice must be provided in the written report. (page 1, ASTM, 2000)

The user and the environmental professional may also need to modify the scope of services performed under this practice for special circumstances, including, but not limited to, operating industrial facilities or large tracts of land (large areas or corridors). (page 10, ASTM, 2000)

The scope of this project was presented to Terra Firma Entitlement Company LLC (the User) in a proposal and contract (number 129883) by Brown and Caldwell and subsequently approved by the User. The scope of services was limited to a qualitative evaluation of environmental conditions of the Study Area. The specific scope of services performed for this Phase I ESA included the following tasks:

- Records research, including review of title records (title report provided by others), historical aerial photography, topographic maps, fire insurance maps and municipal and county case files;
- Requisition and analysis of an environmental database query report from a reputable research company;
- Site reconnaissance, including photographic documentation;
- Interviews with property owners and tenants;
- Interaction with municipal and state agency personnel to review available environmental records and permits;

- Preparation and submittal of a Phase I ESA report summarizing the results of the records research, site reconnaissance, and interviews, the rendering of a professional opinion on any recognized environmental conditions and impacts upon the property, and the inclusion of all reference material.

The scope of services does not include other services that are not described in this report. Section 2.3 details significant assumptions, limitations, and exceptions to the performance of this Phase I ESA.

2.3 Significant Assumptions, Limitations, and Exceptions

ASTM Standard Practice E 1527 cites many assumptions, limitations, and exceptions in the performance of a Phase I ESA (ASTM, 2000). Some of the most important assumptions, limitations, and exceptions are quoted in the following text:

This practice does not address whether requirements in addition to appropriate inquiry have been met in order to qualify for CERCLA's innocent landowner defense (for example, duties specified in 42 USC § 9607(b)(3)(a) and (b)). (page 1, ASTM, 2000)

This practice does not address requirements of any state or local laws or of any federal laws other than the appropriate inquiry provisions of CERCLA's innocent landowner defense. Users are cautioned that federal, state, and local laws may impose environmental assessment obligations that are beyond the scope of this practice. Users should also be aware that there are likely to be other legal obligations with regard to hazardous substances or petroleum products discovered on property that are not addressed in this practice and that may pose risks of civil and/or criminal sanctions for noncompliance. (page 1, ASTM, 2000)

No environmental site assessment can wholly eliminate uncertainty regarding the potential for recognized environmental conditions in connection with a property. Performance of this practice or E 1528 is intended to reduce, but not eliminate, uncertainty regarding the potential for recognized environmental conditions in connection with a property, and both practices recognize reasonable limits of time and cost. (page 8, ASTM, 2000)

Appropriate inquiry does not mean an exhaustive assessment of a clean property. There is a point at which the cost of information obtained or the time required to gather it outweighs the usefulness of the information and, in fact, may be a material detriment to the orderly completion of transactions. One of the purposes of this practice is to identify a balance between the competing goals of limiting the costs and time demands inherent in performing an environmental site assessment and the reduction of uncertainty about unknown conditions resulting from additional information. (page 8, ASTM, 2000)

Not every property will warrant the same level of assessment. Consistent with good commercial or customary practice, the appropriate level of environmental site assessment will be guided by the type of property subject to assessment, the expertise and risk tolerance of the user, and the information developed in the course of the inquiry. (page 8, ASTM, 2000)

This practice does not include any testing or sampling of materials (for example, soil, water, air, building materials). (page 10, ASTM, 2000)

There may be environmental issues or conditions at a property that parties may wish to assess in connection with commercial real estate that are outside of the scope of this practice (the non-scope considerations). As noted by the legal analysis in Appendix X1 of this practice, some substances may be present on the property in quantities and under conditions that may lead to contamination of the property or of nearby properties but are not included in CERCLA's definition of hazardous substances (42 USC § 9601(14)) or do not otherwise present potential CERCLA liability. In any case, they are beyond the scope of this practice. (page 19, ASTM, 2000)

Whether or not a user elects to inquire into non-scope considerations in connection with this practice or any other environmental site assessment, no assessment of such non-scope considerations is required for appropriate inquiry as defined by this practice. (page 19, ASTM, 2000)

There may be standards of protocols for assessment of potential hazards and conditions associated with non-scope conditions developed by governmental entities, professional organizations, or other private entities. (page 19, ASTM, 2000)

Following are several non-scope considerations that persons may want to assess in connection with commercial real estate. No implication is intended as to the relative importance of inquiry into such non-scope considerations, and this list of non-scope considerations is not intended to be all-inclusive: asbestos-containing materials; radon; lead-based paint; lead in drinking water; wetlands; regulatory compliance; cultural and historical resources; industrial hygiene; health and safety; ecological resources; endangered species; indoor air quality; and high voltage powerlines. (page 19, ASTM, 2000)

Note that this Phase I ESA, like Phase I ESAs in general, is limited to the analysis of commercial real estate. Residential properties in the Study Area were not considered in this analysis. Household usage of hazardous substances is controlled by various local, state, and federal laws.

This Phase I ESA was completed in accordance with ASTM guidelines and in accordance with the prevailing standard of care for completing such assessments in California at this time. Brown and Caldwell shall not be subject to any express or implied warranties whatsoever. Phase I ESAs are non-comprehensive by nature and are unlikely to identify all environmental problems or eliminate all risk. This report is a qualitative assessment. Although risk can never be eliminated, more detailed and extensive investigations yield more information, which may help the User understand and better manage risks associated with the property. No warranty, either expressed or implied, is made. Land use, Site conditions, and other factors will change over time. This report should not be relied upon after 180 days from the date of issuance, unless additional services are performed as defined in ASTM E 1527 Sections 4.7 through 4.7.5 (ASTM, 2000).

The property owner is solely responsible for notifying all governmental agencies, and the public at large, of the existence, release, treatment, or disposal of any hazardous substance or petroleum product occurring on the Site, either before, during, or after Brown and Caldwell services. Brown and Caldwell assumes no responsibility or liability whatsoever for any claim, loss of property value, damage, or injury which results from pre-existing materials being encountered or being present on the Site, or from the discovery of such hazardous substances or petroleum products.

This report and other instruments or service are prepared and made available for the sole use of the User and their agents. The contents may not be used or relied upon by any other persons without the express written consent and authorization of the User.

2.4 Special Terms and Conditions

There are no special terms or conditions noted for this Phase I ESA.

2.5 User Reliance

User reliance is defined by ASTM as:

An environmental professional is not required to verify independently the information provided but may rely on information provided unless he or she has actual knowledge that certain information is incorrect or unless it is obvious that certain information is incorrect based on other information obtained in the Phase I Environmental Site Assessment or otherwise actually known to the environmental professional. (page 10, ASTM, 2000)

3.0 SITE DESCRIPTION

3.1 Location and Legal Description

The Study Area for this Phase I ESA is the Study Area for the proposed VOP Project in Patterson, California, and is roughly bounded by Eucalyptus Avenue to the north, Sycamore Avenue to the east (plus one parcel east of this road), Walnut Avenue to the south (plus one parcel south of this road) and the Southern Pacific Rail Line and State Highway 33 to the west, in Stanislaus County, California (Figure 3-1). The Study Area consists of fifty-six parcels totaling approximately 618.20 acres (Table 3-1 and Figure 3-2). This Phase I ESA excludes three other parcels associated with the VOP Project. Two parcels (Assessor Parcel Number [APN] 047-031-017 and APN 047-031-016, totaling 29.33 acres) have already been transferred to the City of Patterson Unified School District for creation of a new school and a Phase I ESA was already performed by Condor Earth Technologies, Inc. (2005). The results of the previously conducted Phase I ESA are discussed later in this report. A third parcel (APN 047-026-025; 19.43 acres), located on Olive Avenue east of Sycamore, is also excluded; this parcel is already owned by the City of Patterson and is used as a stormwater detention basin.

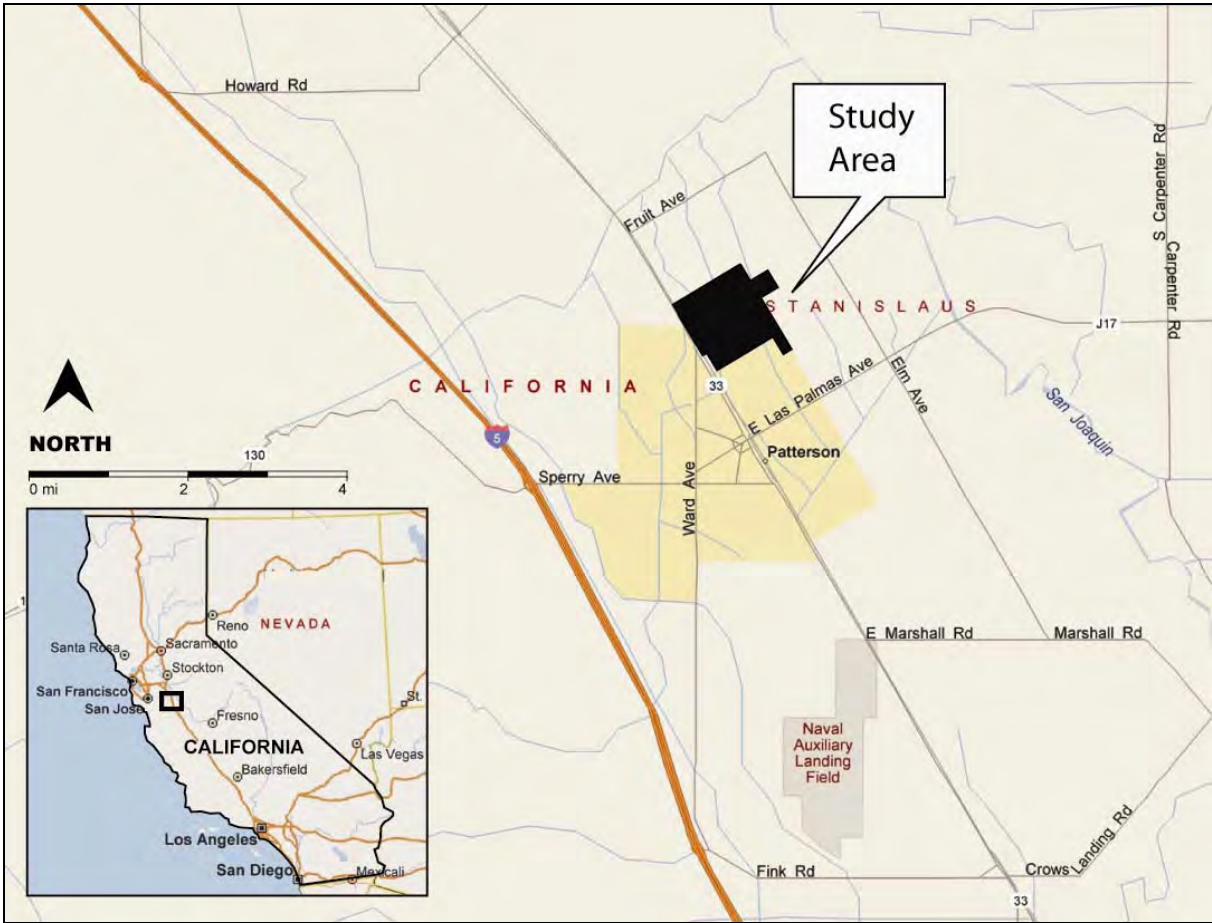


Figure 3-1. Location of Study Area

Table 3-1. Assessor Parcel Numbers (APN) and Corresponding Addresses and Business Establishments

APN	ACRES	OWNERS	SITE ADDRESS	UNITS	COUNTY ZONING
047-025-005	12.11	Deolinda Alves	524 Eucalyptus Ave., Patterson, CA 95363	1	A2-20
047-025-006	58.50	Deolinda Alves	724 Eucalyptus Ave., Patterson, CA 95363	1	A2-20
047-025-008	0.71	Jay D. Endersbe	867 Olive Ave., Patterson, CA 95363	1	A2-20
047-025-011	9.72	John E. Granelli	655 Olive Ave., Patterson, CA 95363	1	A2-20
047-025-012	4.86	Bruce E. Harrington & N H Trust	625 Olive Ave., Patterson, CA 95363	1	A2-20
047-025-013	4.86	Charles W. & Cora L. Drew	613 Olive Ave., Patterson, CA 95363	1	A2-20
047-025-014	36.31	Manuel Alberta, Jr.	343 Olive Ave., Patterson, CA 95363	2	A2-20
047-025-016	0.88	Logan Howard Wilson	225 Olive Ave., Patterson, CA 95363	1	A2-20
047-025-017	1.19	Weslie H. & Robin M. Imada	179 Olive Ave., Patterson, CA 95363	1	A2-20
047-025-019	18.70	Daniel L. Rodrick	14313 Sycamore Ave., Patterson, CA 95363	1	A2-20
047-025-020	18.73	William & Raquel Traina	14125 Sycamore Ave., Patterson, CA 95363	1	A2-20
047-025-022	1.28	Northeast Territories Patterson	227 Olive Ave., Patterson, CA 95363	1	A2-20
047-025-023	0.95	Anthony L. Ban	137 Olive Ave., Patterson, CA 95363	1	A2-20
047-025-024	24.13	Anthony L. Ban	137 Olive Ave., Patterson, CA 95363	0	A2-20
047-025-028	1.00	Northeast Territories Patterson	330 Eucalyptus Ave., Patterson, CA 95363	0	A2-20
047-025-029	22.02	Deolinda Alves	___ Olive Ave., Patterson, CA 95363	0	A2-20
047-025-030	4.85	Northeast Territories Patterson	665 Olive Ave., Patterson, CA 95363	1	A2-20
047-025-035	1.49	Northeast Territories Patterson	150 Eucalyptus Ave., Patterson, CA 95363	1	A2-20
047-025-036	10.57	Northeast Territories Patterson	___ Olive Ave., Patterson, CA 95363	0	A2-20
047-025-037	0.70	Northeast Territories Patterson	837 Olive Ave., Patterson, CA 95363	1	A2-20
047-025-046	3.47	Northeast Territories Patterson	261 Olive Ave., Patterson, CA 95363	0	A2-20
047-025-048	3.83	Arthur H. & Frances E. Filice	261 Olive Ave., Patterson, CA 95363	1	A2-20
047-025-049	1.86	Ricardo A. & Delmy C. Sagastume	342 Eucalyptus Ave., Patterson, CA 95363	1	A2-20
047-025-050	15.88	Bruce E. & Nancy H. Harrington	336 Eucalyptus Ave., Patterson, CA 95363	1	A2-20

Table 3-1. Assessor Parcel Numbers (APN) and Corresponding Addresses and Business Establishments (continued)

APN	ACRES	OWNERS	SITE ADDRESS	UNITS	COUNTY ZONING
047-025-055	0.574	Northeast Territories Patterson	200 Eucalyptus Ave., Patterson, CA 95363	1	A2-20
047-025-056	3.277	John E. & Deborah Otterson	230 Eucalyptus Ave., Patterson, CA 95363	1	A2-20
047-025-063	42.01	David J. De Lash	___ Eucalyptus Ave., Patterson, CA 95363	0	A2-20
047-025-066	1.53	Bruno & Shelley Marie Tardif	320 Eucalyptus Ave., Patterson, CA 95363	1	A2-20
047-025-067	3.84	Northeast Territories Patterson	150 Eucalyptus Ave., Patterson, CA 95363	0	A2-20
047-026-026	18.26	C. E. & Martha J. Thompson	524 Eucalyptus Ave., Patterson, CA 95363		A2-20
047-031-002	2.55	Greenville, LLC	14506 N. 1st St., Patterson, CA 95363	1	A2-20
047-031-004	8.43	Jim Barletta	14712 N. 1st St., Patterson, CA 95363	1	A2-20
047-031-005	9.72	Northeast Territories	300 Olive Ave., Patterson, CA 95363	0	A2-20
047-031-006	29.16	John S. Ban	342 Olive Ave., Patterson, CA 95363	0	A2-20
047-031-008	13.42	Northeast Territories Patterson	860 Olive Ave., Patterson, CA 95363	1	A2-20
047-031-012	9.63	Northeast Territories Patterson	___ Sycamore Ave., Patterson, CA 95363	0	A2-20
047-031-013	9.19	Juan V. & Rosa E. Mejia	14955 Sycamore Ave., Patterson, CA 95363	1	A2-20
047-031-014	21.88	Delwyn & Madeline Silveira	801 Walnut Ave., Patterson, CA 95363	1	A2-20
047-031-015	36.76	C. E. & Martha J. Thompson	673 Walnut Ave., Patterson, CA 95363	0	A2-10
047-031-018	9.78	Maria E. Ramirez	___ Walnut Ave., Patterson, CA 95363	1	A2-10
047-031-020	14.77	Delores A. Barletta (Trust)	___ N. Walnut., Patterson, CA 95363	0	A2-10
047-031-023	0.55	F. D. Dennis & Katherine Trust	900 Olive Ave., Patterson, CA 95363	1	A2-20
047-031-024	8.57	Bruce E. Harrington & N H Trust	14561 Sycamore Ave., Patterson, CA 95363	1	A2-20
047-031-028	15.29	Dale Raimondi	___ Olive Ave., Patterson, CA 95363	0	A2-20
047-031-029	22.19	Jose & Martha Sandoval Ramirez	___ Olive Ave., Patterson, CA 95363	0	A2-20
047-031-030	7.40	Dale Raimondi	___ Olive Ave., Patterson, CA 95363	0	A2-20
047-031-032	0.98	Fritz & Donna Schali	14619 Sycamore Ave., Patterson, CA 95363	1	A2-20
047-031-033	5.73	Jim Barletta	14742 N. 1st St., Patterson, CA 95363	1	A2-10

Table 3-1. Assessor Parcel Numbers (APN) and Corresponding Addresses and Business Establishments (continued)

APN	ACRES	OWNERS	SITE ADDRESS	UNITS	COUNTY ZONING
047-031-034	9.75	Maria E. Ramirez & 2001	14848 N. 1st St., Patterson, CA 95363	1	A2-10
047-031-035	18.80	John James & Brenda Joyce Ramos	226 Olive Ave., Patterson, CA 95363	0	A2-20
047-031-036	1.00	Susan P. Thorkelson	260 Olive Ave., Patterson, CA 95363	1	A2-20
047-031-037	6.65	Northeast Territories	14701 Sycamore Ave., Patterson, CA 95363	1	A2-20
047-031-038	1.91	Fritz & Donna Schali	14619 Sycamore Ave., Patterson, CA 95363	0	A2-20
047-031-039	6.64	BKE Investments, LLC	14601 N. 1st St., Patterson, CA 95363	0	PD-17
047-031-040	0.56	County of Stanislaus	__ 1st St., Patterson, CA 95363	0	PD-17
047-035-003	18.80	Clarence L. Rodrick	__ 1st St., Patterson, CA 95363	0	A2-20
Total Acres	618.20		Total Dwellings	36	

VOP Parcels excluded from this Phase I ESA

047-026-025	19.43	City of Patterson (Drainage Basin)			
047-031-017	19.55	City of Patterson (School District)	361 Walnut Ave., Patterson, CA 95363	0	A2-10
047-031-016	9.78	City of Patterson (School District)	513 Walnut Ave., Patterson, CA 95363	1	A2-10

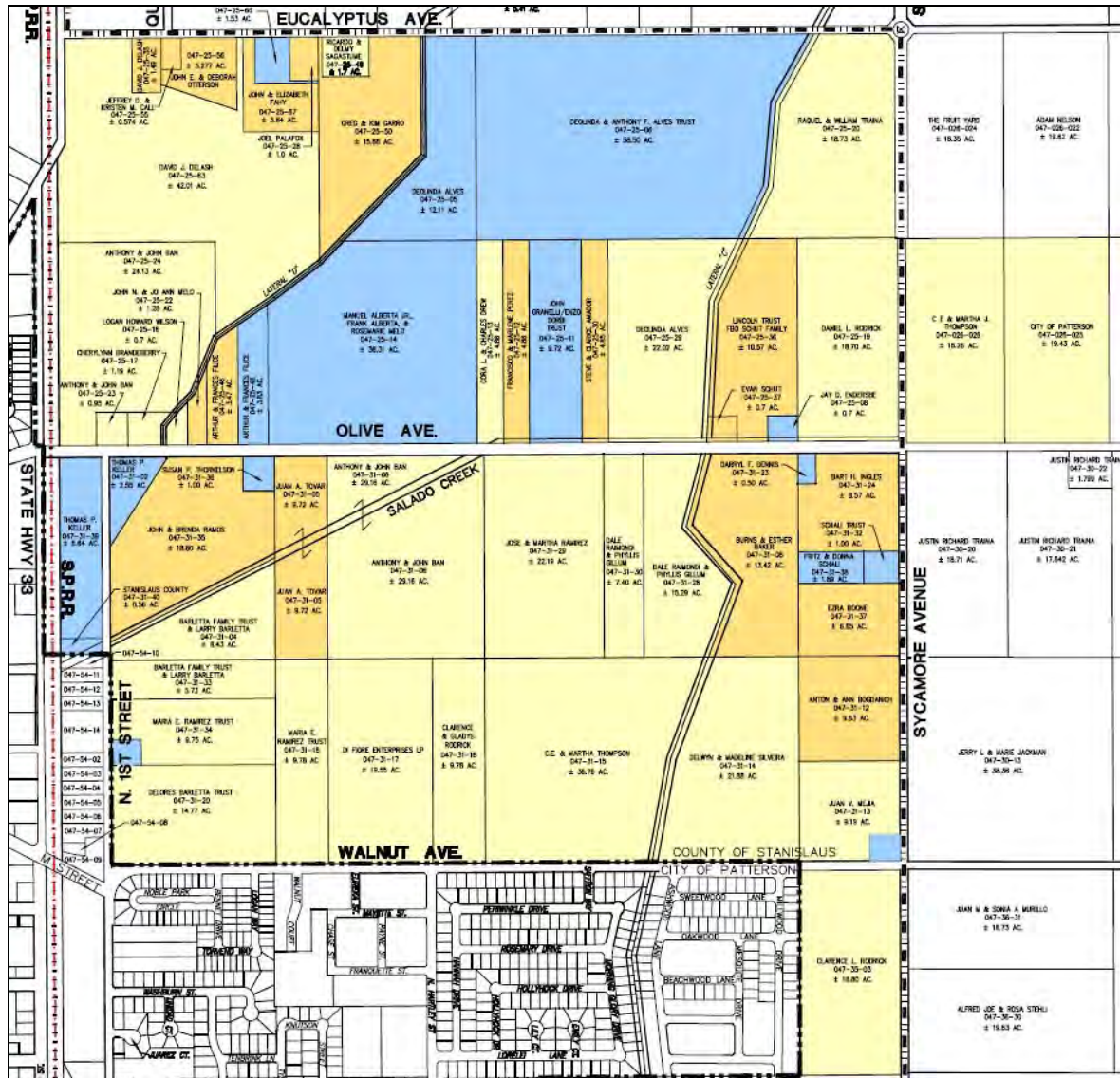


Figure 3-2. VOP Parcel Map (Source: GDR Engineering, Inc.)

3.2 Site and Vicinity General Characteristics

The Study Area is a rural area adjacent to a rapidly expanding city. Like surrounding parcels, the Study Area was traditionally used for agricultural production and rural residences. Orchards and canals, once the dominant features of the landscape, are being rapidly replaced with dense residential housing developments in the vicinity of the Study Area. Industrial and light commercial uses dominate along the Union Pacific Railroad/Highway 33 corridor. The Interstate 5 corridor is also experiencing increased residential and commercial development. Water diversions projects and the San Joaquin River are also major geographical features in the area.

3.3 Current Use of the Study Area

The Study Area contains a total of 56 parcels, and the average parcel size is 11 acres. The current county zoning for all but two parcels in the Study Area is “General Agriculture District” A-2-20 or A-2-10. Two parcels on First Street (APN 047-031-039 and 047-031-040) are zoned “Planned Development District” PD-17. The primary land use is agricultural production, and specifically, commercial row crops (including oats and alfalfa) and commercial stone fruit orchards (primarily apricot). Other land uses in the Study Area include rural residential developments and several commercial enterprises.

3.4 Descriptions of Improvements on the Site

The Study Area contains approximately 36 residential dwellings and numerous detached garages, barns, sheds, and other storage structures. Utilities include underground communication lines, pole-mounted communication lines and electrical lines with electrical transformers (but no leakage or staining was observed), private wells and septic systems, and private propane tanks. Numerous paved County roads and private paved or graveled roads exist in the Study Area. Two unlined irrigation canals and appurtenances also occur in the Study Area.

3.5 Current Uses of the Adjoining Properties

The west boundary of the Study Area is the Union Pacific (formerly Southern Pacific) Railroad corridor and the State Highway 33 corridor. Commercial and light industrial enterprises are found along these corridors as well as along First Street. Schools and daycare facilities in the vicinity are identified in Figure 5-1. Orchards and rural residences are located to the north and to the east. To the south, residential developments dominate. Patterson Airport is located approximately 2 miles west of the Study Area.

4.0 USER-PROVIDED INFORMATION

4.1 Title Records

Title record reports for each parcel in the Study Area were prepared by Chicago Title Company in March 2006 (Appendix A-1). An attempt was made to build the chain of title back at least 50 years from the present, with focus upon the names of entities in deeds and leases that might indicate industrial uses, and any statement of reduced value or liens on the title, especially environmental

protection liens recorded pursuant to CERCLA. No specific records were found for two parcels - APN 047-031-038 and APN 047-031-034. The results of this title review follows.

The only corporations mentioned in title documents were title companies, family trusts, agricultural/ farm businesses, and the investor of the proposed VOP, Northeast Territories Patterson LLC. An Oil, Gas, and Mineral Lease was obtained in 1981 by Conley & Associates, Inc. (with an interest transferred later to AMOCO Production Company) on at least 15 parcels in the Study Area: APN 047-025-006, APN 047-025-014, APN 047-025-019, APN 047-025-020, APN 047-025-036, APN 047-025-037, APN 047-025-049, APN 047-025-050, APN 047-031-015, APN 047-031-020, APN 047-031-029, APN 047-031-033, APN 047-031-035, APN 047-031-036, and APN 047-035-003. Numerous parcels adjacent to, or in the vicinity of, the Study Area also granted this lease. Another Oil, Gas, and Mineral Lease on APN 047-025-024 was noted. A 1956 quitclaim deed from Minerals and Petroleum Development Corporation to the Knutson Family released an interest in oil and gas lease executed in 1949. Another Oil, Gas, and Mineral Lease on APN 047-026-026 was granted in 1981 to Ogle Petroleum Inc. and Sun Oil Company in 1980. Title reviews and other forms of research were unable to establish if any of these Oil, Gas, and Mineral Leases resulted in exploration or development of any natural resource with the Study Area.

In an Individual Grant Deed dated 1984 on APN 047-025-009 and APN 047-025-047, the Schut Family granted title to the Wani Family. On the deed the box was checked, "*The undersigned grantor(s) declares(s): computed on full value less value of liens and encumbrances remaining at time of sale.*" Title reviews and other forms of research were unable to establish any reason for reduced value, and no liens or encumbrances were identified. A later title transfer in 1991 states no liens or encumbrances.

4.2 Environmental Liens or Activity and Use Limitations

An environmental lien is a charge, security, or encumbrance upon the title to a property to secure the payment of a cost, damage, debt, obligation, or duty arising out of response actions, cleanup, or other remediation of hazardous substances or petroleum products upon the property. No environmental liens or activity and use limitations were made aware to Brown and Caldwell. No evidence of environmental liens was identified during the interview process, title review, or records review.

4.3 Specialized Knowledge

No specialized knowledge was provided to Brown and Caldwell.

4.4 Valuation Reduction for Environmental Issues

No valuation reductions for environmental issues were made aware to Brown and Caldwell. No valuation reductions were identified during the interview process or in the title review other than those stated in Section 4.1.

4.5 Owner, Property Manager, and Occupant Information

Owner, property manager, and occupant information was gathered during the records research, site reconnaissance, and interview process and is summarized later in this report. However, Terra Firma Entitlement Company LLC did provide a previous environmental assessment that will be discussed

here. This Phase I ESA excludes two parcels (APN 047-031-017 and 047-031-016) from the Study Area because they were already transferred to the Patterson Unified School District for creation of a new school which will support the VOP. A Phase I ESA was performed on these two parcels by Condor Earth Technologies, Inc. (2005) (Appendix A-2). The questionnaire for APN 047-031-017 completed by landowner Richard DiFiore indicated previous usage of pesticides and ASTs. Site reconnaissance of APN 047-031-017 by Condor Earth Technologies, Inc. reported stained soils and petroleum odors at the barn complex. Condor Earth Technologies, Inc. concluded that three recognized environmental conditions existed on APN 047-031-017: 1) the past presence of ASTs and probable gasoline or diesel fuel usage; 2) evidence of petroleum product soil staining and odors, and likely contamination of soil with petroleum hydrocarbons at the farm complex; and 3) historical pesticide usage and storage, and likely contamination of soil at the farm complex. Condor Earth Technologies, Inc. also reported possible lead contamination of soil from paint of farm complex buildings. Condor Earth Technologies, Inc. reported no historical recognized environmental conditions. Condor Earth Technologies, Inc. reported the following *de minimis* conditions: the need to properly abandon domestic water well and septic system; the suggestion to remove refuse, including automotive tires and battery; and the determination of function of buried pipe near the house. Condor recommended that the School District revise the proposed school site boundary to exclude the “southwestern portion of APN 047-031-017 where the former farm complex was situated.” Condor Earth Technologies, Inc. (2005) also recommended that a Preliminary Environmental Assessment be completed to “evaluate pesticide concentrations in Site soil under the oversight of DTSC” (page 21). Note that one petroleum pipeline owned by Kinder-Morgan Energy Partners was identified as occurring within one mile of the Study Area by Condor Earth Technologies, Inc. (2005), but the specific location was not identified.

4.6 Reason for Performing Phase I ESA

ASTM Standard Practice E 1527 states that the reason for performing the Phase I ESA should be stated, and gives the most common reasons in the following quoted text:

Either the user shall make known to the environmental professional the reason why the user wants to have the Phase I Environmental Site Assessment performed or, if the user does not identify the purpose of the Phase I Environmental Site Assessment, the environmental professional shall assume the purpose is to qualify for the innocent landowner defense to CERCLA liability and state this in the report. (page 10, ASTM, 2000)

In addition to satisfying one of the requirements to qualify for the innocent landowner defense to CERCLA liability, another reason for performing a Phase I Environmental Site Assessment might include the need to understand potential environmental conditions that could materially impact the operation of the business associated with the parcel of commercial real estate. (page 10, ASTM, 2000)

Use Not Limited to CERCLA – This practice and Practice E 1528 are designed to assist the user in developing information about the environmental condition of a property and as such has utility for a wide range of persons, including those who may have no actual or potential CERCLA liability and/or may not be seeking the innocent landowner defense. (page 8, ASTM, 2000)

This Phase I ESA was performed at the request of Terra Firma Entitlement Company LLC. This project-level Phase I ESA was needed for the proposed VOP Project for the following reasons: to screen properties for environmental conditions before title transfer; to identify properties that may

require site investigation (Phase II ESA); and to support the preparation of the California Environmental Quality Act Environmental Impact Report for the VOP Project, and specifically, the Hazards/Hazardous Substances Chapter. Project-level Phase I ESAs are often used to evaluate the hazards and hazardous substances setting in a Study Area, to aid in the determination of potential impacts of hazards and hazardous substances upon the proposed project, and to aid in the identification of potential mitigation measures to reduce negative impacts of hazards or hazardous substances to a less-than-significant level.

5.0 RECORDS REVIEW

5.1 Standard Environmental Record Sources

As part of this study, Environmental Data Resources, Inc. (EDR) was subcontracted to provide comprehensive environmental and historical information, including proprietary databases, aerial photography, topographic maps, Sanborn Maps, and city directories. A specialized data query, the EDR Area Study, was ordered because of the size and complexity of the Study Area. In this Area Study, EDR presents the results of searches of all reasonably ascertainable environmental databases (federal, state, local, and private) for records of potential environmental impacts in the Study Area and vicinity. EDR performed these database searches within the prescribed radii of ASTM method E 1527-00 (ASTM, 2000). The databases queried by EDR included the following:

- Federal ASTM Standard and Supplemental – National Priority List (NPL); proposed NPL; Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS); CERCLIS No Further Remedial Action Planned; Corrective Action Report; Resource Conservation and Recovery Act (RCRA) Information; RCRA Large Quantity Generator; Emergency Response Notification System; Superfund Consent Decrees; Records of Decision; NPL Deletions, Hazardous Materials Information Reporting System; Material Licensing Tracking System; Mines Master Index File; Federal Superfund Liens; polychlorinated biphenyl compound (PCB) Activity Database System; Department of Defense Sites; Indian Reservations; Uranium Mill Tailings Sites; Engineering Controls Sites List; Open Dump Inventory; Formerly Used Defense Sites; RCRA Administrative Action Tracking System; Toxic Chemical Release Inventory System; Toxic Substances Control Act (TSCA); Section 7 Tracking Systems; Federal Insecticide, Fungicide, and Rodenticide Act / TSCA; US Brownfields; US Institutional Control Sites; Voluntary Clean-up Program Properties; State ASTM Standard and Supplemental – Proposition 65 Records; Toxic Pits Cleanup Act Sites; Bond Expenditure Plan; List of Underground Storage Tank Facilities; Voluntary Cleanup Program Facilities; Leaking UST on Indian Land; UST on Indian Land; Waste Discharge System; Deed Restriction Listing; Properties Needing Further Evaluation; No Further Action Determination; Well Investigation Program Case List; Emissions Inventory Data; School Property Evaluation Program; and Former Manufactured Gas Sites.

The full EDR Area Study report is provided in Appendix B-1. Results are summarized in the following text, Table 5-1, and accompanying index map (Figure 5-1). Numbered elements in this map correspond to properties reported on various databases. Table 5-1 summarizes these mapped elements, and those cases within the Study Area (numbers 2, 5, 7, 8, and 10) are denoted with an asterisk (*). Table 5-2 lists cases found by EDR but that were not mapped due to insufficient location information. None of the address descriptions correspond with addresses inside the Study Area, but many occur within a one-half mile radius from the Study Area boundary.

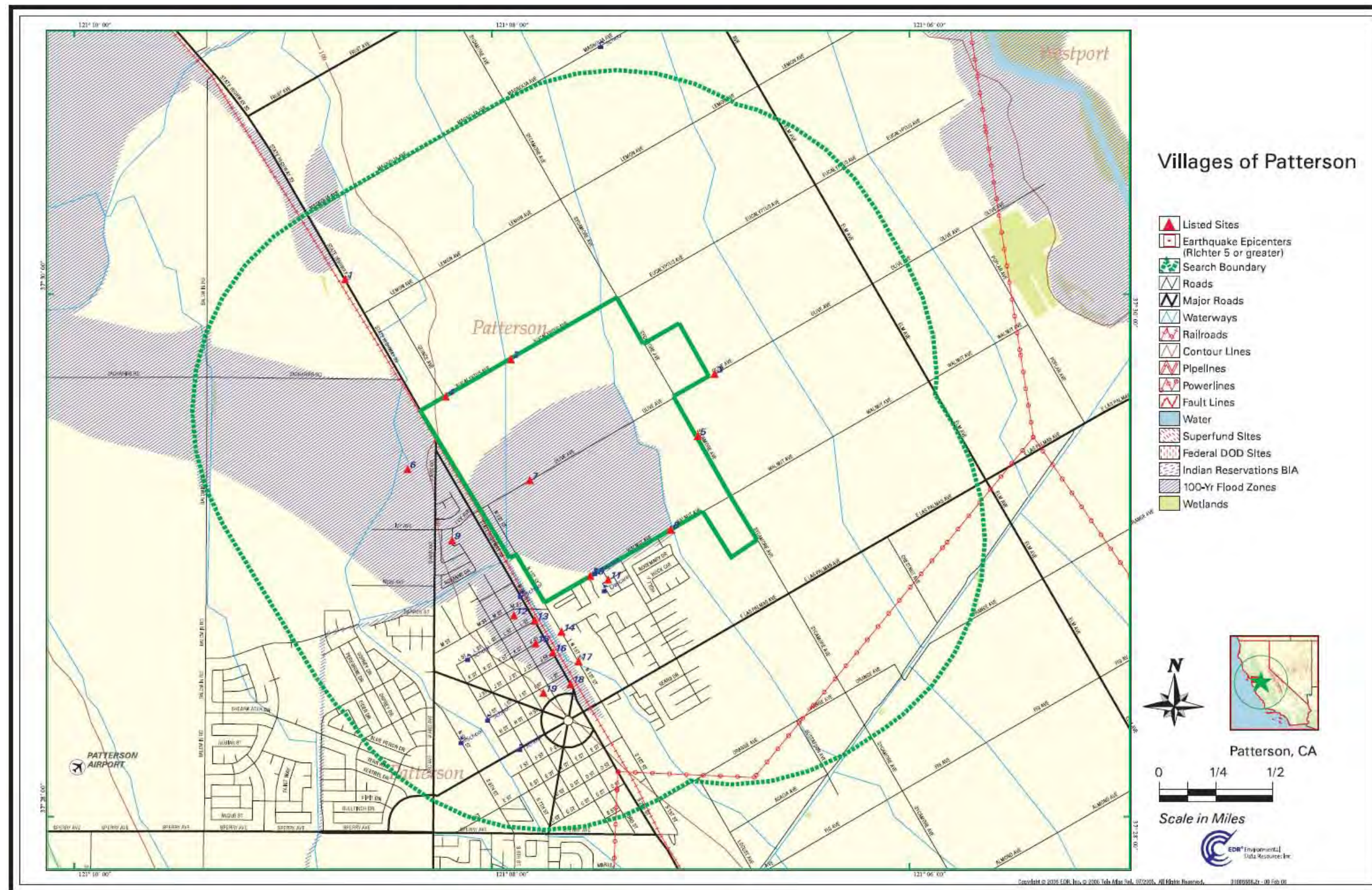


Figure 5-1. EDR Area Study Map, with Cases Numbered

Table 5-1. Mapped Sites from EDR Area Study

Map ID	Site Name	Site Address	Databases	Details/ Case status
1	Gibson Refinery Service / Patterson	13331 N Hwy 33, Patterson, CA 95363	RCRA-LOG, RCRA-TSDF, CORRACTS, CERC-NFRAP, HIST UST	Petroleum release, soil and water affected, ongoing remediation and monitoring
2*	Anthony Alves	524 Eucalyptus Ave, Patterson, CA 95363	HIST UST, SWEEPS UST	Registered tanks (550-gallon diesel, 550-gallon unleaded)
3	Traina	1206 Olive Avenue, Patterson, CA 95363	HIST UST, SWEEPS UST	Registered tank (550-gallon leaded)
4	De Rose Bros.	207 Eucalyptus, Patterson, CA 95363	HIST UST, SWEEPS UST	Registered tank (350-gallon unleaded)
5*	Boone Bros.	14701 Sycamore Ave, Patterson, CA 95360	HIST UST, SWEEPS UST	Registered tank (400-gallon diesel)
6	Valley Tractor	14319 N Hwy 33, Patterson, CA 95363	RCRA-SQG, FINDS, HAZNET	Small quantity generator - waste oil, mixed oil
7*	Victor Hugo Mena	300 Olive Avenue, Patterson, CA 95363	HAZNET	Lab waste chemical disposal
7*	John & Anthony Ban	342 Olive Ave, Patterson, CA 95363	HIST UST, SWEEPS UST	Registered tanks (525-gallon leaded gasoline)
8*	Bright Development Inc	748 Walnut Ave, Patterson, CA 95363	HAZNET	Asbestos-containing waste disposal
9	Michael Hinson	949 Mary Jane Ave. Patterson CA 95363	RCRA-SQG, FINDS	Small quantity generator, waste unspecified
10*	Clarence Rodrick	513 Walnut Ave, Patterson, CA 95363	HIST UST, SWEEPS UST	Registered tank (350-gallon leaded)
11	Housing Authority of Stanislaus County	503 Mayette, Patterson CA 95363	SWEEPS UST	No specifics
12	Hancor, Inc.	First Street, Patterson, CA 95363	HIST UST	Registered tank (1,000-gallon diesel)

Table 5-1. Mapped Sites from EDR Area Study (continued)

Map ID	Site Name	Site Address	Databases	Details/ Case status
13	Palmer's Beacon Service	500 N 2 nd St, Patterson, CA 95381	HIST UST	Registered tanks (7,000-gallon regular, 4,000-gallon diesel, 5,000-gallon unleaded)
13	Patterson Beacon	500 Second, Patterson, CA 95363	LUST, Cortese	Soil contamination found during tank closure, remedial actions, case closed
14	Ryland Swimming Pool	401 N 1 st St, Patterson, CA 95126	HAZNET, San Jose HAZMAT	Asbestos containing waste disposal
15	Lazo Trucking	250 K St. No 5, Patterson, CA 95363	RCRA-SQG, FINDS	Small quantity generator, no specifics on waste type
16	John's Mini Mart	320 Second, Patterson, CA 95363	LUST, Cortese	Gasoline release, aquifer affected, tank pulled, case open
17	Patterson Water District	200 First, Patterson, CA 95363	LUST, HIST UST	Gasoline release, soil affected, case closed; 2 registered tanks (590-gallon regular, 515-gallon unleaded)
17	Patterson Water	200 1 st St N, Patterson, CA 95363	Cortese	No specific data
18	JEM Electric	118 Second, Patterson, CA 95363	LUST, Cortese	Gasoline release, aquifer affected, remedial actions, case closed
18	PRC-Patterson Incorporated	Patterson, CA	FUDS	No specific data
19	Patterson Ford Mercury	250 El Circulo Ave, Patterson, CA 95363	RCRA-SQG, FINDS, HAZNET, LUST, Cortese	Small quantity generator; gasoline release, aquifer affected, remedial actions, case closed;

Source: Area Study by EDR, Inc. (text presented is unabridged)

Numbered cases within the Study Area are marked with an asterisk (*).

Database Acronyms are as follows: CERCLIS NFRAP = CERCLA No Further Remedial Action Planned; CORRACTS = Corrective Action Report; Cortese = "Cortese" Hazardous Waste and Substance List; EMI = Emissions Inventory Data; FINDS = Facility Index Identification System; FUDS = Formerly Used Defense Site Program; HAZNET = Facility and Manifest Database; HIST UST = Hazardous Substance Storage Container List; LUST = Leaking Underground Storage Tank Incident Reports; REF = Unconfirmed properties referred to another agency; RCRA-LQG = RCRA large quantity generator; RCRA-SQG = RCRA Small quantity generator; RCRA TSDF = RCRA facility that Treats, Stores, or Disposes of waste; San Jose HAZMAT = Hazardous Materials Facilities; SLIC = Statewide Spills, Leaks, Investigations, Clean-ups Cases; SWEEPS UST = Statewide Environmental Evaluation and Planning System UST list.

Table 5-2. Unmapped Sites from EDR Area Study

Site Name	Site Address	Databases
Patterson Water District	200 N 1 st St, Patterson, CA 95363	SWEEPS UST
Patterson Warehouse Co.	420 S 2 nd , Patterson, CA 95363	SWEEPS UST
City Corporation Yard	4 th / B St, Patterson, CA 95363	SWEEPS UST
Patterson Unified School Dist.	200 N 7 th St, Patterson, CA 95363	SWEEPS UST
Chevron Pipe Line (Former Standard Oil Pipeline)	Highway 33 @ Las Palmas Ave, Patterson, CA 95363	SLIC
De Lash Enterprises Inc.	16561 Hwy 33, Patterson, CA 95363	LUST
Del Puerto SVC	131 # 3 rd St., Patterson, CA 95363	HIST UST
Patterson Middle School	American Eagle Avenue, Patterson, CA 95363	SCH
Patterson Pump Station	PO Box 661, Patterson, CA 95363	HIST UST
PG&E Substation, NP-1166, Patterson Substation	Canal Rd, between Elm and Chestnut, Patterson, CA 95363	SLIC
Patterson Water District	22 Del Puerto, Patterson, CA 95363	HAZNET
Del Puerto Canyon Seismic Site / CA State University	Del Puerto Canyon, Patterson, CA 95363	SWEEPS UST
R Corner Store	115 Del Puerto, Patterson, CA 95363	SWEEPS UST
Richard Ferrari	16200 Del Puerto Ave, Patterson, CA 95363	SWEEPS UST
Frank Raines Park	Del Puerto Canyon Road, Patterson, CA 95363	HIST UST
Patterson Disposal Site	East end of Eucalyptus Ave, Patterson, CA 95363	FINDS
Vieira Petroleum Co Patterson Facility	341 S First Street, Patterson, CA 95363	FINDS
Sierra Pacific Patterson	340 South First Street, Patterson, CA 95363	SLIC
City Corporation Yard	Fourth / B Streets, Patterson, CA 95363	FINDS
Refineries Service	13331 N Highway 33, Patterson, CA 95363	SWEEPS UST
ChevronTexaco, DMSI, Patterson	800 S. Hwy 33, Patterson, CA 95363	SLIC

Table 5-2. Unmapped Sites from EDR Area Study (continued)

Site Name	Site Address	Databases
Patterson Pump Station	PO Box 661, Patterson, CA 95363	SWEEPS UST
Patterson Radio Relay/AT&T Communications, Inc.	Oak Flat Rd, Patterson, CA 95363	SWEEPS UST
Patterson Pump Station	Oak Flat Road, Patterson, CA 95363	SLIC
Contamination Site NP139 – Tosco Patterson Pump St	999 Oak Flat Road, Patterson, CA 95363	SLIC
Tosco – Patterson Pump Station	Oak Flat Rd, Patterson, CA 95363	HAZNET, SLIC
Patterson Radio (CAK599)	Oak Flat Rd. , Patterson, CA 95363	AST
Patterson Flying Service	999 P.O. Box 692, Patterson, CA 95363	SLIC
Patterson Flying Service Corporation	2549 S Perry, Patterson, CA 95363	SLIC
Patterson Wastewater Treatment	14901 Poplar Ave	SWEEPS UST
Patterson Arco	15051 Roger Rd, Patterson, CA 95363	EMI, FINDS
Creekside Elementary School Site	Shearwater Drive / Henley Parkway, Patterson, CA 95363	SCH
Patterson MS	Sperry Ave 2 mi W of __, Patterson, CA 95363	SWEEPS UST
Chevron Thompson Chevrolet	999 Sperry Rd / Hwy 33, Patterson, CA 95363	SLIC
Patterson Yard	F St, Patterson, CA 95363	SWEEPS UST
PRC Patterson Site	State Highway 33, Patterson, CA 95363	CERCLIS
Walnut Avenue Middle School	361 Walnut Avenue, Patterson, CA 95363	SCH
Rising Sun School, Patterson Unified School District	Spencer / Welty, Vernalis	SWEEPS UST

Source: Area Study by EDR, Inc. (text presented is unabridged)

Database acronyms are as follows: AST = Aboveground Storage Tank Facilities database; CERCLIS = Comprehensive Environmental Response, Compensation, and Liability Information System; Cortese = "Cortese" Hazardous Waste and Substance List; EMI = Emissions Inventory Data; FINDS = Facility Index Identification System; HAZNET = Facility and Manifest Database; HIST UST = Hazardous Substance Storage Container List; LUST = Leaking Underground Storage Tank Incident Reports; SCH = School Property Evaluation Program; SLIC = Statewide Spills, Leaks, Investigations, Clean-ups Cases; and SWEEPS UST = Statewide Environmental Evaluation and Planning System UST list.

5.2 Additional Environmental Record Sources

5.2.1 Central Valley Regional Water Quality Control Board

The Central Valley Regional Water Quality Control Board (CVRWQCB) was contacted via a phone message with Mike Smith, Environmental Scientist, UST Section (msmith@waterboards.ca.gov; phone: 916.464.4728) on February 16, 2006, and a follow-up e-mail on February 17, 2006. Mr. Smith responded by phone on February 21, 2006. Mr. Smith stated that he had no knowledge of any active cases in the Study Area where the CVRWQCB was the lead. Mr. Smith suggested contacting the Stanislaus County Department of Environmental Resources (DER) for case information. Mr. Smith sent an e-mail response on February 21, 2006, and also suggested viewing the Leaking Underground Storage Tank (LUST) Quarterly Report (dated January 2006), available on the Internet at the CVRWQCB website at http://www.waterboards.ca.gov/centralvalley/available_documents/ug_tanks/LUST.pdf. The CVRWQCB Leaking Underground Storage Tank Quarterly Report list was queried for all cases in Patterson, California, which consist of the following cases. The text provided is unabridged.

- T and M Market, #500419, 107 Second, Patterson, LUST Program, gasoline release, aquifer affected, county lead, case closed
- Patterson Ford Mercury, #500408, 250 El Circulo, Patterson, LUST Program, gasoline release, aquifer affected, county lead, case closed
- Patterson Water District, #500026, 200 First Street, Patterson, LUST Program, gasoline release, soil affected, county lead, case closed
- Holton Automotive, #500185, 208 El Circulo, Paterson, LUST Program, gasoline release, soil affected, county lead, case closed
- Patterson Beacon, #500342, 500 Second Street, Patterson, LUST Program, release not defined, soil affected, county lead, case closed
- DeLash Enterprises Inc., #500258, 16561 Hwy 33, Patterson, LUST Program, release not defined, aquifer and soil affected, site assessment underway, county lead; case open
- Thompson Chevrolet, #500015, Hwy 33 & Sperry Ave, Patterson, LUST Program, gasoline release, aquifer affected, CVRWQCB lead, case closed
- Harris Property FMR Chem Away Inc, #500148, 113 Third, Patterson, LUST Program, gasoline release, aquifer affected, site assessment underway, county lead; case open
- Westside Laundry, #500113, 420 Del Puerto Rd, Patterson, Spills, Leaks, Investigation, and Clean-up Program, release not defined, aquifer affected, CVRWQCB lead, site assessment underway, case open

- Patterson Concrete Pipe Co., #500202, 12499 Baldwin, Patterson, LUST Program, gasoline release, soil affected, county lead, case closed
- John's Mini Mart, #500455, 320 Second, Patterson, LUST Program, gasoline release, aquifer affected, preliminary investigation report submitted, case open
- Musson's Sporting Goods, #500034, 103 Second, Patterson, LUST Program, gasoline release, aquifer affected, county lead, case closed
- PRC Patterson, #500167, 13331 Hwy 33, Patterson, LUST Program, release undefined, aquifer affected, county lead, post remediation monitoring, case open
- CA Dept Forestry, #500370, 2142 Sperry, Patterson, LUST Program, gasoline release, soil affected, county lead, case closed
- EZ Serve Store, #500030, 115 Del Puerto, Patterson, LUST Program, gasoline release, aquifer affected, county lead, case closed
- JEM Electric, #500044, 118 Second, Patterson, LUST Program, gasoline release, aquifer affected, county lead, case closed
- Campbell Ranch, #500504, 16521 Ward, Patterson, Local Oversight Program, release undefined, aquifer affected, county lead, remediation underway, case open
- Paul Oil Company Inc, #500499, 511 Second, Patterson, LUST Program, release undefined, aquifer affected, county lead, remediation underway, case open

None of these cases occur in the Study Area, but some of them occur within a one-half mile radius of the Study Area boundary.

5.2.1.1 GeoTracker Database

GeoTracker is a geographic information system (GIS) maintained by the California State Water Resources Board (SWRB) that provides online access to environmental data at the Internet address (URL) = <http://www.geotracker.swrcb.ca.gov>. GeoTracker is the interface to the Geographic Environmental Information Management System (GEIMS), a data warehouse which tracks regulatory data about underground fuel tanks, fuel pipelines, and public drinking water supplies. GeoTracker and GEIMS were developed pursuant to a mandate by the California State Legislature (AB 592, SB 1189) to investigate the feasibility of establishing a statewide GIS for leaking underground fuel tank (LUFT) sites. GEIMS can store extensive data related to LUFT sites, or any other contaminant release. In addition, GEIMS is used to store and display information from various agencies including water quality information, water use information, and infrastructure data needed to assess both water supplies and contaminant sites. For the SWRCB's groundwater quality assessment goal, GEIMS has been populated with LUFT, public drinking water wells, and fuel pipelines for California. Site information from the Spills, Leaks, Investigations, and Cleanups (SLIC) Program is also included in GeoTracker. The GeoTracker database was queried for environmental

data pertaining to the Site on March 12, 2006 (see Appendix B-2 for query results). Using both spatial queries (Figure 5-2) and text-based searches of bounding street addressees in GeoTracker, no reported cases were found inside the Study Area. In the Patterson area, the following cases are summarized below. The text provided is unabridged.

GeoTracker Registered UST Database

- Fred Frias Union, 226 North Second Street, Patterson
- G's Food Mart, 101 E Las Palmas Ave, Patterson
- John's Mini Mart, 320 North Second Street, Patterson
- R Corner Store, 115 Del Puerto, Patterson
- TEG Investments LP, 15051 Rogers Road, Patterson
- Viera Petroleum Co, 341 S First Street, Patterson

GeoTracker LUFT Database

- CA Dept of Forestry, 2142 Sperry, Patterson, case closed
- Campbell Ranch, 16521 Ward, Patterson, case open
- DeLash Enterprises, Inc., 16561 Hwy 33, Patterson, case open
- EZ Serve Store, 115 Del Puerto, Patterson, case closed
- Harris Property FMR Chem Away Inc, 113 Third, Patterson, case open
- JEM Electric, 118 Second, Patterson, case closed
- Musson's Sporting Goods, 103 Second, Patterson, case closed
- PRC [Petroleum Recycling Company] Patterson, 13331 Hwy 33, Patterson, open case
- Patterson Beacon, 500 Second, Patterson, case closed
- Patterson Concrete Pipe Co, 12499 Baldwin, Patterson, case closed
- Patterson Ford Mercury, 250 El Circulo, Patterson, case closed
- Patterson Water District, 200 First Street, Paterson, case closed
- Paul Oil Company Inc., 511 Second, Patterson, case open

- T and M Market, 107 Second, Patterson, case closed
- Thompson Chevrolet, Hwy 33 & Sperry Ave, Patterson, case closed
- Westside Laundry, 420 Del Puerto Rd, Patterson, case open

GeoTracker SLIC Database

- A.L. Castle, Inc., 1607 W. Marshal Road, Patterson, case open
- Campbell Ranch, 16521 Ward, Patterson, case open
- Chevron Pipeline Co – former Standard Oil Pipeline, Highway 33, Patterson, case open
- ChevronTexaco, DMSI, Patterson, 999 Sperry Rd & Hwy 33, case open
- ChevronTexaco, Thompson Chevrolet, Hwy 33, Patterson, case open
- Contamination Site NP139 – TOSCO Patterson Pump St, 999 Oak Flat Road, Patterson, case open
- Karl Herger Inventory Farm, 1266 Almond Avenue, Patterson, case open
- PAC Veg Inc., 1607 West Marshal Rd, Patterson, case open
- PACOAST, Inc., 105 North First Street, Patterson, case open;
- Patterson Flying Service Corporation, 2549 Sperry, Patterson, also a Land Disposal case, case open
- PG&E Substation, NP-1166, Canal Road, Patterson, case open
- Thorkelson Ranch, 13218 Elm Avenue, Patterson, case open
- Viera Petroleum Co, 341 S First Street, Patterson, case open
- Westside Cleaners & Laundry, 101 Del Puerto Rd, Patterson, case open

GeoTracker Municipal Well Database

- Numerous private and public wells are listed in the vicinity of the Study Area

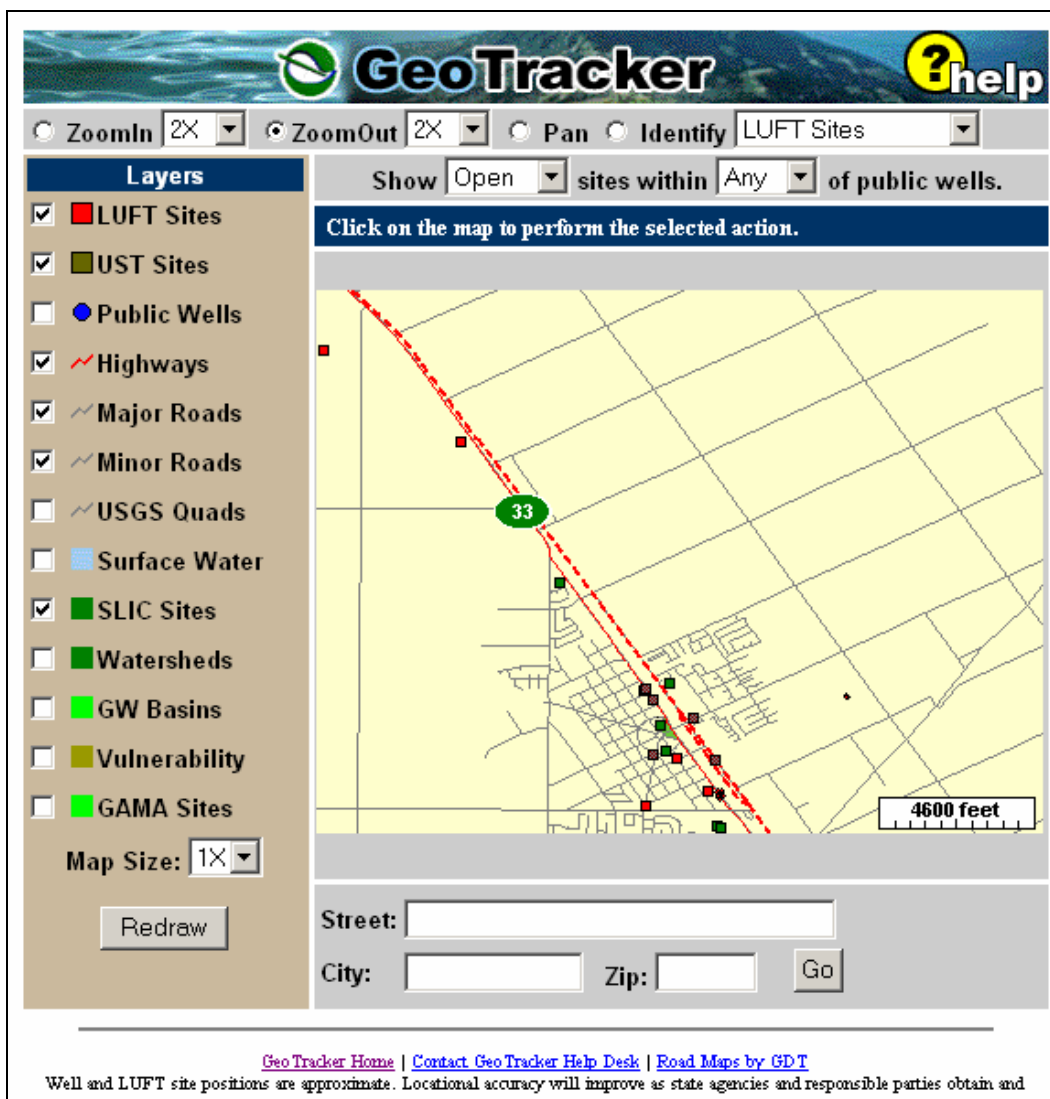


Figure 5-2. Map of Spatial Query of GeoTracker Database

5.2.2 Department of Toxic Substances Control

A records request was faxed on February 17, 2006 to the California Department of Toxic Substances Control (DTSC) (8800 Cal Center Drive, Sacramento CA 95826-300; phone: 916.255.3545; fax: 916.255.6447) (Appendix E-1). Bobbi Jenson, Records Coordinator, responded by mail on February 21, 2006, stating that no DTSC records existed for the Study Area (Appendix E-1). The DTSC maintains the Envirostor website and database the scope of which is described as "California clean-up sites involving DTSC". Envirostor is available on-line at the DTSC website at <http://www.envirostor.dtsc.ca.gov/public/default.asp>. An on-line Envirostor database query was performed on March 14, 2006 of "Patterson," which revealed no sites; a query of "Stanislaus County" revealed a list of 29 sites (Appendix B-3), none of which have addresses in Patterson or near the Study Area.

5.2.3 Stanislaus County Department of Environmental Resources Case Records

The Stanislaus County DER case files were reviewed on February 7, 2006 (see Appendix B-4 for case file documentation). The following text summarizes case file information pertinent to the Study Area and vicinity.

Hazardous Material Operators Within the Study Area

The following entities located within the Study Area have Hazardous Materials Business Plans or Farm Inventories on file with Stanislaus County DER, detailing various hazardous materials and petroleum product usage or storage.

- Alves Farming, 524 Eucalyptus Avenue; Hazardous Materials Farm Plan Inventory Certification dated 2004; two USTs inventoried (550-gallon diesel and 550-gallon gasoline); [but three tanks were listed historically in the Statewide Environmental Evaluation and Planning System (SWEEPS) database].
- Farm of Leland Thorkelson, 260 Olive Avenue; Hazardous Materials Farm Inventory dated 1987; 300-gallon diesel (container unspecified), 5-gallons of gasoline, 1 gallon of Round-up herbicide, 1 gallon of unspecified solvent.
- Farm of Art Filice Jr., 261 Olive Avenue; Hazardous Materials Business Plan on file dated 1989 and 1995; with the following registered storage containers - 300-gallon diesel AST, 200-gallon gasoline AST, 55-gallon drum of hydraulic oil, 55-gallon drum of motor oil, 300-pound sack of Parathion.
- Farm of John and Anthony Ban, 342 Olive Avenue, 525-gallon gasoline UST (from SWEEPS database).
- Manuel Alberta Jr. Farm, 343 Olive Avenue; Farm Chemical Inventory Certifications dated 2001 lists one 300-gallon gasoline AST, one oxygen cylinder, and one 55-gallon waste oil drum; another dated 1986 lists one 500-gallon gasoline tank, one 500-gallon diesel tank, one 500-gallon propane tank, 200 pounds of Kocide cupric hydroxide, 120 pounds of Parathion, 610 gallons of Super 94 oil, 40-gallons of motor oil.
- Farm of Clarence Rodrick, 513 Walnut Avenue, Hazardous Materials Farm Plan Inventory Certificate, dated 2003, lists one 350-gallon gasoline UST.
- Lopina Ranch, John and Janice Lopina, 673 Walnut Avenue, Hazardous Materials Business Plan on file, no reportable quantities of hazardous materials.

Because these entities are supervised by Stanislaus County DER, this usage and storage of hazardous substances and petroleum products is considered a *de minimis* environmental condition.

Hazardous Material Operators Outside the Study Area

The following entities located outside the Study Area have Hazardous Materials Business Plans or Farm Inventories on file with Stanislaus County DER, detailing various hazardous materials and petroleum product usage or storage:

- City of Patterson, #WDR 7002, Walnut/Poplar, Patterson, various sanitary landfill permits.
- John's Mini Mart, 320 Second Street, Hazardous Materials Management Plan, dated 2004, on file, indicating registered gasoline UST.
- 17000 Del Puerto Avenue, registered UST.

Numerous other commercial and industrial enterprises outside the Study Area using hazardous substances are tracked by the Stanislaus County DER. EDR records from the State's SWEEPS database were also investigated at Stanislaus County DER. Stanislaus County DER had no records for the following addresses: 207 Eucalyptus Avenue; 14701 Sycamore Avenue; and 300 Olive Avenue.

Hazardous Materials Release Cases Within the Study Area

No Stanislaus County DER hazardous materials release cases were identified within the Study Area.

Hazardous Materials Release Cases Outside of the Study Area

The following Stanislaus County DER hazardous materials release cases were identified in the vicinity of the Study Area.

- Patterson Water District, #PPS 49, 200 First Street, Patterson, leaking UST case, soil contaminated, two USTs removed in 1986 and soil disposed; "no further action" letter on file; case closed. Because this property has been remediated to the satisfaction of Stanislaus County DER, this case does not appear to pose a risk to the Study Area.
- Vieras Petroleum, #SS 4050, 341 S. First, Patterson, state agency lead, case open. Due to the distance from the Study Area, this case does not appear to pose a risk to the Study Area.
- DeLash Enterprises Inc, #PPS 486, 16561 S HWY 33, Patterson; leaking UST case, case open. Due to the distance from the Study Area, this case does not appear to pose a risk to the Study Area.
- J.E.M. Electrical and Plumbing, 118 Second Street, leaking UST case, soil and groundwater contaminated, one 500-gallon gasoline UST removed in 1987 and soil disposed; "no further action" letter issued in 1998; also noted that crude oil was detected in soil and groundwater samples, Standard Oil pipeline along Southern Pacific Railroad railway implicated; case closed. Because this property has been remediated to the satisfaction of Stanislaus County DER, this case does not appear to pose a risk to the Study Area.

- John's Mini Mart, 320 Second Street, three UST's and dispensers removed in 1999, and previously, two 10,000-gallon gasoline UST's, one 5,000-gallon gasoline, one 200-gallon waste oil, and two dispensers were removed; soil contamination by petroleum hydrocarbons was detected; case open. Due to the distance from the Study Area, this case does not appear to pose a risk to the Study Area.
- PRC, #FUD 9000, 13331 HWY 33, Patterson, Formerly-used Defense Site (FUDS) case, case open.
- Petroleum Recycling Corporation, #SS 4906, 13331 HWY 33, Patterson, state agency lead, case status = closed; also #PPS 129, leaking UST case, case open.
- Thompson Chevrolet – Emerald Pump Station, #SS4013, 701 S. Hwy 33 & Sperry, Patterson, CVRWQCB lead, case open.
- Standard Chevron Pipeline, #SS 4106, HWY 33 & Las Palmas, Patterson; trenching detected petroleum pipes and release from Standard Oil Old Valley Pipeline, state agency lead, case open.

All of these cases are either remediated and/or closed, or are located far enough away from the Study Area to be unlikely to have no detrimental effect on the Study Area, except for two cases: the PRC Patterson case (#FUD 9000 and #SS 4906); and the Thompson Chevrolet/Standard Chevron Pipeline case (#SS4013 and #SS 4106). These cases are discussed next.

5.2.3.1 PRC - Patterson

The former PRC – Patterson, also known as Enviropur Waste Oil Recycling Facility and Gibson Refinery Service, was a 10-acre facility in operation from 1970's to 1996 (Figure 5-3). In 1996 the owner declared bankruptcy and abandoned the facility, leaving behind “*millions of gallons of oil, sludge and oil wastewater stored in aging and dilapidated tanks and over 1,100 oil filter and chemical drums, oil filters, and twenty roll-off bins containing contaminated soil*” (quoted from United States Environmental Protection Agency [USEPA] memorandum, a copy of which is provided in Appendix B-4). The USEPA issued a Unilateral Administrative Order in 1998 identifying the responsible party as all entities that used PRC for petroleum product disposal or recycling – these parties formed the Patterson Environmental Response Trust. The USEPA also identified specific remedial actions to be taken; case #SS 4906 documents the removal of one 5,000-gallon oil UST in 2000; case #PPS 129 involves ongoing remedial activities, with DTSC as the lead. A Superfund Removal program action conducted in 1999-2000 removed all above-ground containers, including seven ASTs (400,000-gallon to 2.25 million-gallon capacities), 1,100 drums, and 14 roll-off bins (Figure 5-3) (Appendix B-4). Subsurface remedial activities are apparently not finished, but the site is in the monitoring phase. This PRC site was formerly Standard Oil Company's Vanormer Pump Station, one of the crude oil pump stations for their Old Valley Pipeline, discussed next.

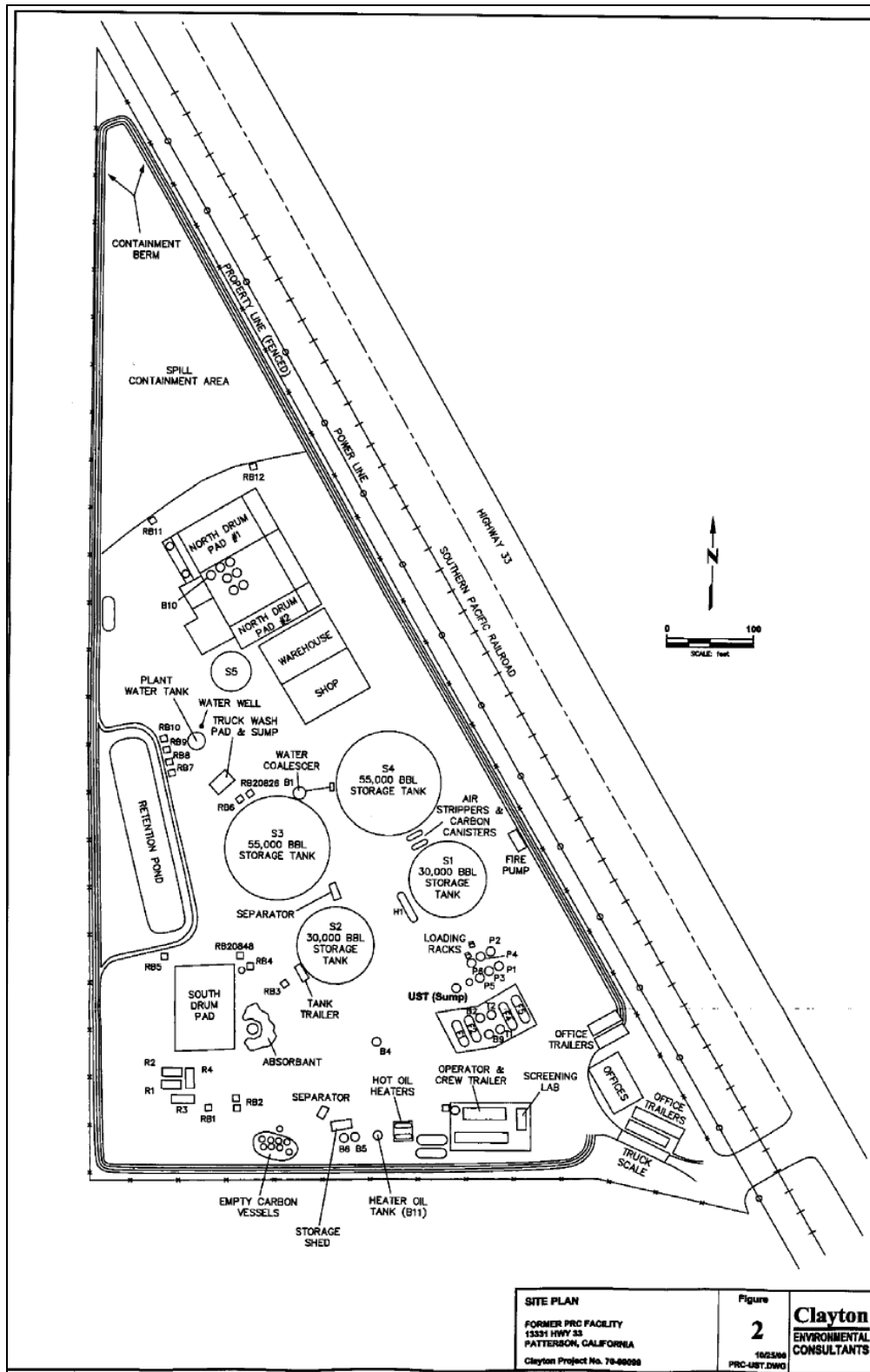


Figure 5-3. Site Plan of Former PRC Facility (Source: Clayton Group Services)

5.2.3.2 Old Valley Pipeline and Pump Stations

The Old Valley Pipeline (OVP) was owned and operated by Standard Oil (now ChevronTexaco) from the early 1900's to the 1960's to transport heated crude oil from the Bakersfield oilfields to a refinery in Richmond. The OVP was part of the Historical Pipeline Portfolio-Bakersfield to Richmond Project. In the vicinity of the Study Area, the OVP consisted of two 8-inch lines, aligned between State Highway 33 and the Union Pacific (formerly Southern Pacific) Railroad rails. ChevronTexaco provided a map, As-Built #PL10086, revised 1933, of the OVP alignment in the vicinity of the Study Area (Appendix C-5). A detail of this As-Built is shown in Figure 5-4. Two OVP pumping stations occur near the Study Area – the Vanormer Pump Station to the north and Emerald Pump Station to the south (Figure 5-5 and Figure 5-6). At least two Stanislaus County DER cases of petroleum hydrocarbon contamination of soils in the vicinity of the Study Area were reported - #SS 4013 and #SS 4106.

Case #SS 4013, Thompson Chevrolet – Emerald Pump Station, located at 701 S. Hwy 33 at Sperry Avenue, is an open case with the CVRWQCB as the lead agency. The Thompson Chevrolet dealership was built on property historically occupied by a portion of the Emerald Pump Station of the OVP, and as such, one of the responsible parties includes Chevron Environmental Management Company (ChevronTexaco). During UST removals in 1986 by Thompson Chevrolet, soils impacted by gasoline and crude oil were found. Site investigations were conducted in 1989, 1991, and 1996. A remedial action plan was published in 1997, and a Site Investigation, Human Health Risk Assessment, and remedial action plan was finished in 1998. A soil vapor extraction system was implemented and remedial actions completed in 2000. Off-site investigations in 2000 revealed no groundwater contamination. In 2004, a monitoring workplan was implemented.

Standard Oil's OVP Vanormer Pump Station is the same site as the PRC – Patterson site, both at 13331 Highway 33. A detail of the 1933 Standard Oil As-built shows the location of the Vanormer Pump Station (Figure 5-5) and the United States Geological Survey (USGS) topographic maps indicated its location as well (Figure 5-7). The OVP and the Vanormer Pump Station are considered potential sources of contamination for the Study Area.

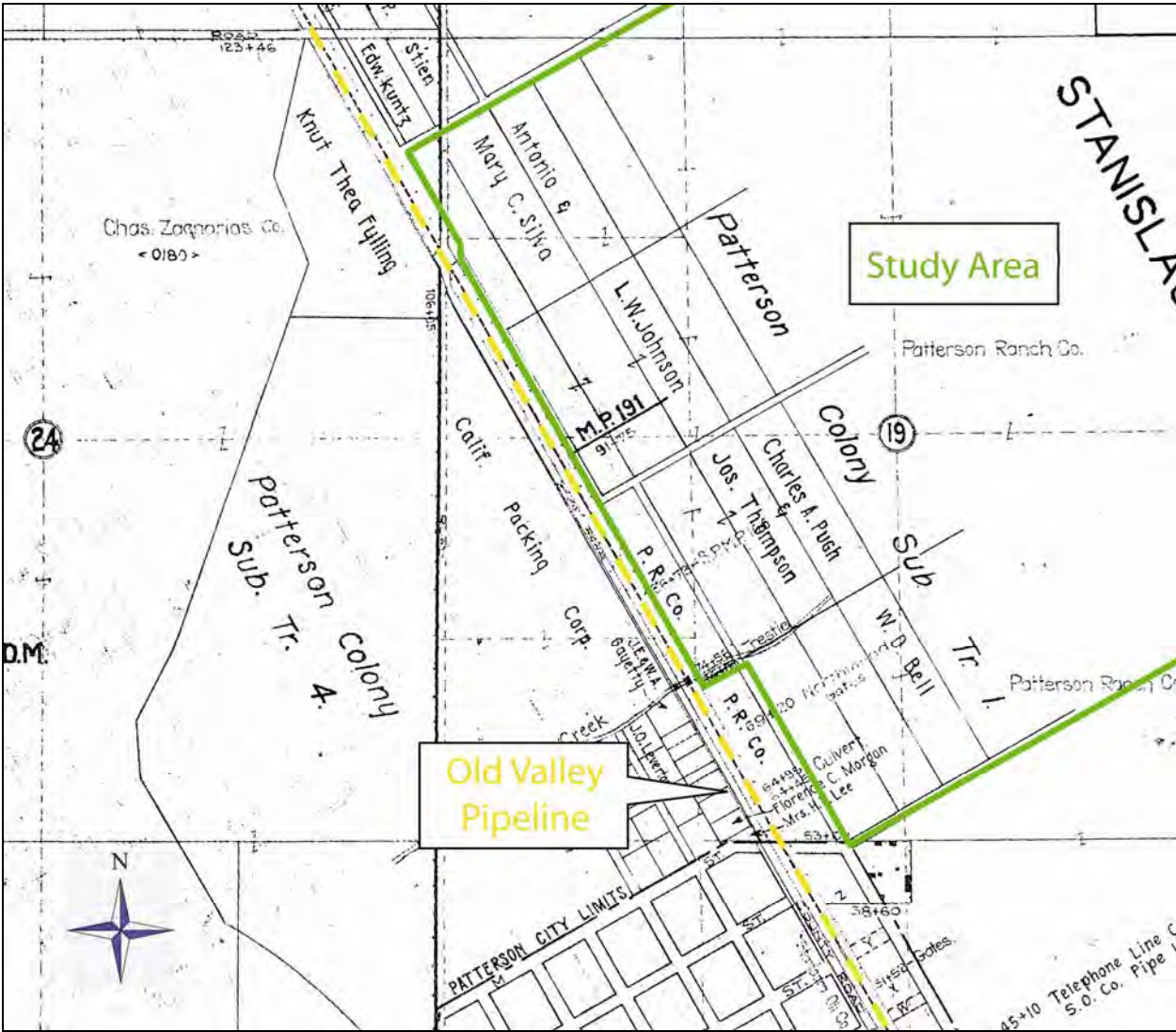
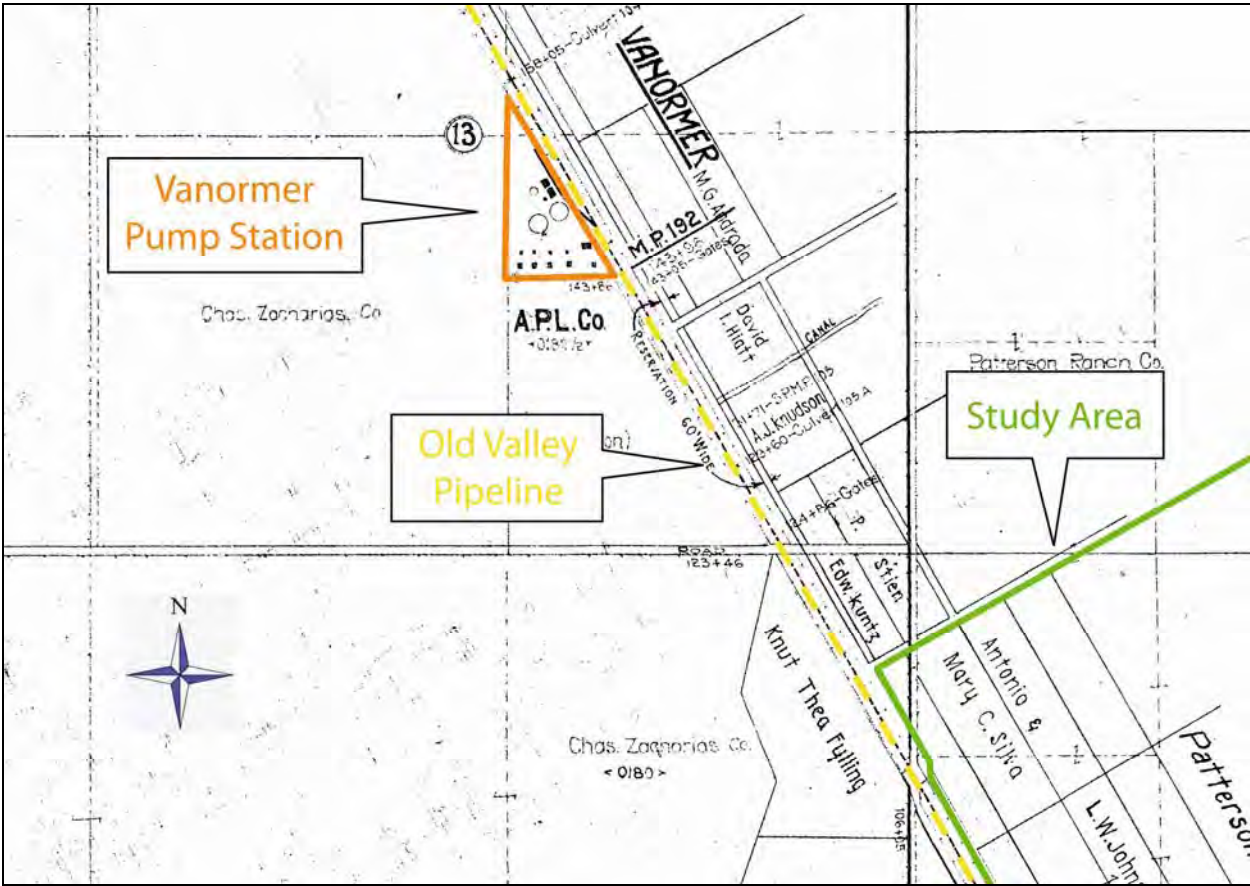


Figure 5-4. Detail of the Standard Oil Co. OVP As-Built dated 1933 Locating Alignment of Two 8-inch Pipelines



**Figure 5-5. Detail of the Standard Oil Co. OVP As-Built dated 1933
Locating Pipeline and Vanormer Station**

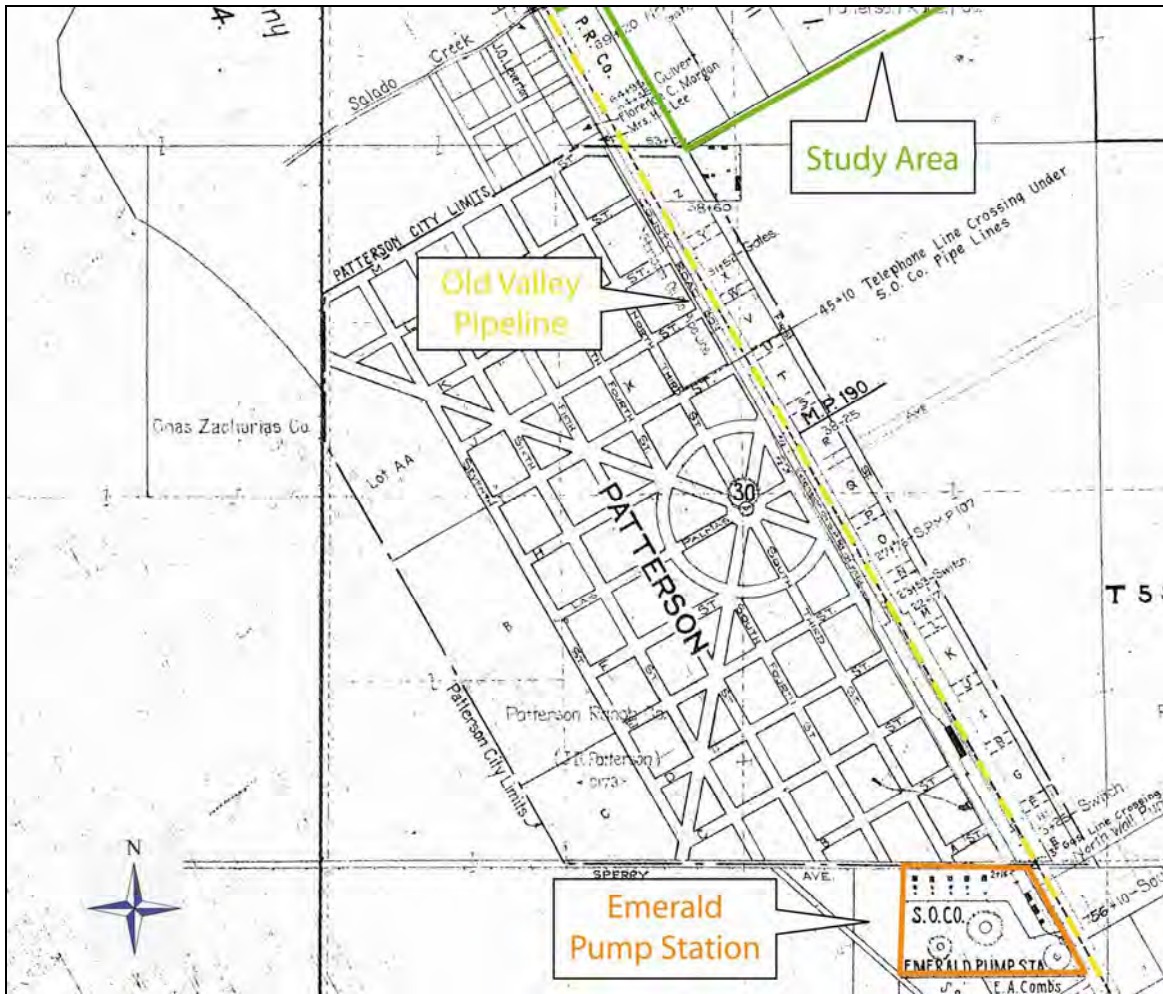


Figure 5-6. Detail of the Standard Oil Co. OVP As-Built dated 1933 Locating Pipeline and Emerald Station



Figure 5-7. Detail of the Patterson 7.5-minute Quadrangle dated 1916

5.2.4 Stanislaus County Agricultural Commissioner's Office

Steve Logan (Agriculture Inspector III) of the Stanislaus County Agricultural Commissioner's Office (209.525.4730) was contacted about the Study Area on March 15, 2006. Mr. Logan faxed the data request form to initiate the file review process. A request was made to inspect all files of agricultural chemical/pesticide permits and usage and storage in the Study Area. Mr. Logan e-mailed the results of this data query on March 23, 2006 in a Microsoft Excel spreadsheet (Appendix B-5). A summary of this data query follows.

According to Mr. Logan, Stanislaus County Agricultural Commissioner's Office began tracking specific quantities of pesticide applications in 2001. No County data exists before this year. Reported pesticide usage for the Study Area began in March 2001 and included data up until January 2006. The amounts reported were 5.8 tons of solids chemicals and 2,778 gallons of liquid chemicals, with the maximum application rates being 20 pounds/acre for solids and 5 gallons/acre for liquids. Table 5-3 lists the permittees/pesticide applicators, their addresses, and inferred Assessor Parcel Numbers. Details of all chemicals reported as applied in the Study Area can be found in Appendix B-5.

Table 5-3. Permittees and/or Pesticide Applicators within the Study Area on File with the County

Permittee / Applicator	Address Description	Inferred APN
INGLES, BART	SW COR OLIVE & SYCAMORE	047-031-024
TRAINA DRIED FRUIT	SW COR EUCALYPTUS/SYCAMORE	047-025-020
REICHMUTH FARMS	N/S WALNUT 1/4MI W SYCAMORE	047-031-014
JOHNSON, JON	NE SYCAMORE & OLIVE	047-026-026
LUCICH/SANTOS FARMS	SE COR EUCALYPTUS & HWY 33	047-025-053
SILVA, DAVID J.	S/OLIVE BTW SYCAMORE/HWY 33	047-031-006
DE LASH, DAVID	SE COR EUCALYPTUS & HWY 33	047-025-053
J & M FARMS	NE COR WALNUT & 1ST ST.	047-031-020
ALVES, DEOLINDA & PAT	S/EUCALYPTUS BTW LAT 3/4	047-025-006
ALVES, DEOLINDA & PAT	SE COR. EUCALYPTUS & PWD LAT 4	047-025-005
ALVES, DEOLINDA & PAT	SE LAT 3 AND OLIVE	047-031-008
ALVES, DEOLINDA & PAT	N/OLIVE 3/8M E/HWY 33	047-025-014
ALVES, DEOLINDA & PAT	NE COR. WALNUT & PWD LAT 3	047-031-014
RODRICK FARMS	NW COR OLIVE & SYCAMORE	047-025-019
RODRICK FARMS	1/2M W/SYCAMORE N/WALNUT	047-031-016
RODRICK FARMS	SW WALNUT/SYCAMORE	047-031-016
PEREZ FARMS-WESTLEY	NE COR EUCALYPTUS/SYCAMORE	047-031-011
PEREZ FARMS-WESTLEY	S/EUCALYPTUS BTW LAT 3/4	047-025-006
SCHUT, ELWOOD	N/OLIVE 3/4M E/HWY 33	047-025-036/37
LOPINA RANCH	N/WALNUT 1/4M W/SYCAMORE	047-031-014
BARLETTA, LARRY	N S WALNUT E OF 1ST STREET	047-031-020
BARLETTA, LARRY	NE COR 1ST & WALNUT AVE	047-031-020
BARLETTA, LARRY	N/1ST BTW WALNUT/OLIVE AVES	047-031-033/04
BARLETTA, LARRY	N/ WALNUT E/ 1ST STREET	047-031-020
BARLETTA, LARRY	1/4M E OF 1ST S/S OF OLIVE	047-031-005
BARLETTA, LARRY	1/2M W OF SYCAMORE, N/S WALNUT	047-031-015
T & M FARMS	NE OLIVE & HWY 33	047-025-024
T & M FARMS	S/OLIVE 1/2M E 1ST STREET	047-031-006
CHIRCOP, RICHARD	3/8M E OF HWY 33 S/S EUCALYP	047-025-050
CHIRCOP, RICHARD	1/4M E OF 1ST ST S/S OF OLIVE	047-031-005
CHIRCOP, RICHARD	SE COR OLIVE & 1ST ST	047-031-002
CHIRCOP, RICHARD	1/4M W OF SYCAMORE S/S OLIVE	047-031-028
SCHALI, JONATHAN	S/OLIVE AVE 1/2M E/1ST STREET	047-031-028
SCHALI, JONATHAN	NE COR HWY 33/OLIVE AVE	047-025-024
BAKER, BURNS	SE LAT C AND OLIVE AVENUE	047-031-008
GRANELLI, ROBERT	N/OLIVE 1/2 MILE E/HWY 33	047-025-011
CASTRO, LINO	N/OLIVE 1/2M E/HWY 33	047-025-014
MEJIA, JUAN	NW COR WALNUT & SYCAMORE	047-031-013
RAMOS FARMS	S/OLIVE AVE E/LATERAL D	047-031-035

Text provided is unabridged.

5.3 Physical Setting Sources

The Study Area is located in the junction of four USGS 7.5-degree minute (1:24,000) topographic maps: Brush Lake, Crows Landing, Patterson, and Westley (see Section 5.4.1 for topographic maps). From inspecting these digital elevation models and from site reconnaissance, the topography in the Study Area can be summarized as generally flat with a subtle downward slope to the northeast toward the San Joaquin River Valley. Elevations range from approximately a maximum of 105 feet (in the northwest corner) to 70 feet (on the eastern border) above mean sea level. The Study Area is located in the San Joaquin River watershed. The majority of the Study Area lies within a 100-year flood plain, as defined by the Federal Emergency Management Agency Flood Insurance Rate Maps (see EDR Well report; Appendix B-1). The Study Area contains two gravity-driven irrigation ditches - Lateral 3 North (previously named Lateral C) and Lateral 4 North (previously named Lateral D) - originating from the Main Canal to the south, which diverts water from the San Joaquin River via pump lift stations. The Study Area also contains the channelized Salado Creek, originating from the Coastal Range to the west. Surrounding the Study Area are numerous waterbodies, including the Delta-Mendota Canal and California Aqueduct, and irrigation ditches such as Lateral B, Lateral K, First Lift, and Lateral M.

The Study Area soil type is *part of the Myers Series, which is very deep, well drained soil formed in alluvium from sedimentary rock sources, specifically Myers clay with zero to two percent slopes.* (page 16, Condor Earth Technologies, Inc., 2005) The surficial geology of the Study Area is Quaternary Alluvial Fan Deposits, and in the vicinity, Ordovician Dos Palos Alluvium and Quaternary Modesto Formation (Condor Earth Technologies, Inc., 2005). The California Department of Water Resources (DWR) has divided California into various groundwater basins. The Study Area is located in the Turlock Groundwater Basin, which is located within the San Joaquin River Region. The DWR's latest groundwater basin contour map is shown in Figure 5-8, and groundwater flow direction in the Study Area vicinity is inferred to be to the northeast (DWR, 2004). Groundwater in the this basin occurs in three water-bearing zones as follows: the lower zone which contains confined fresh water in the lower Tulare Formation; an upper zone which contains confined, semi-confined, and unconfined water in the upper section of the Tulare Formation and younger deposits; and a shallow zone which contains unconfined water within 25 feet of the land surface (Brown and Caldwell, 2002). Public and private groundwater wells identified in EDR's query of readily-available databases is shown in Figure 5-9.

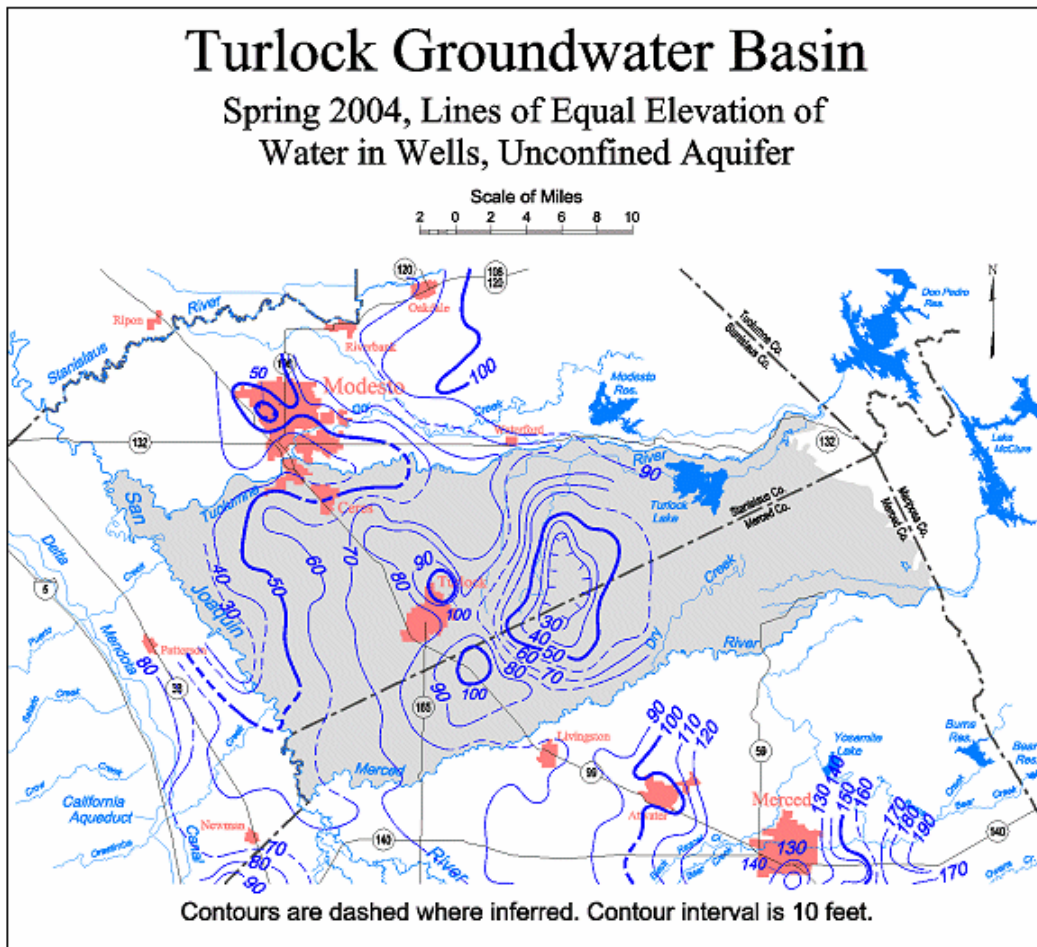


Figure 5-8. Turlock Groundwater Basin Map
(Source: Department of Water Resources, 2004)

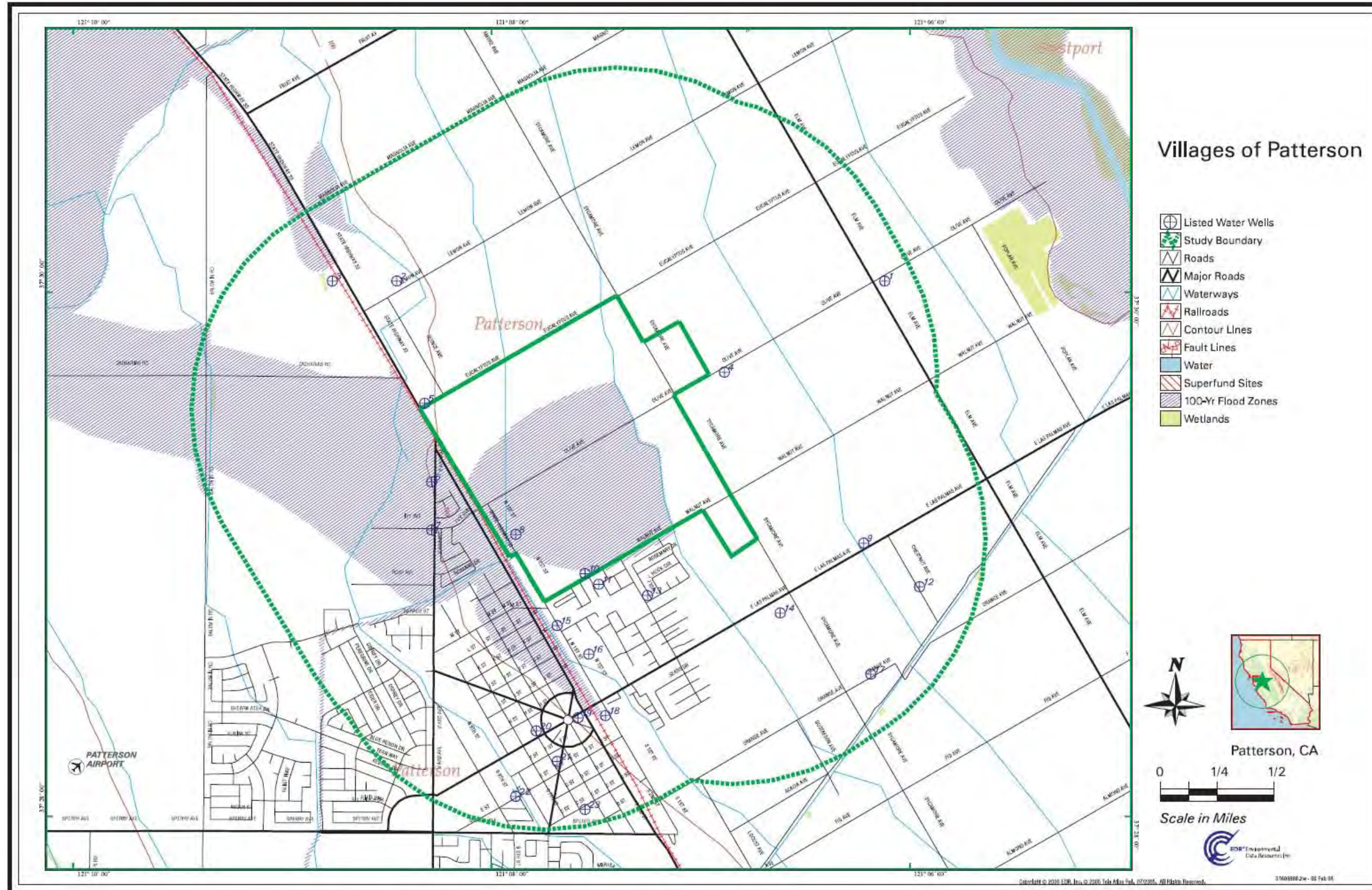


Figure 5-9. EDR Well Map

5.4 Historical Use Information on the Property

5.4.1 Topographic Map Analysis

Historical and current topographic maps of the Study Area were analyzed to determine any of the following: topography and inferred surface water and ground water flow direction; current and historical land use; and current and historical structures, utilities, and roads. All available USGS topographic quadrangle maps were obtained through EDR (see Appendix C-1 for the original maps). The following 7.5 degree-minute quadrangle maps were obtained: “Brush Lake”, editions dated 1953, 1969, and 1976; “Crows Landing”, editions dated 1916, 1952, 1971, and 1980; “Patterson”, editions dated 1916, 1953, 1971, and 1978; and “Westley”, editions dated 1915, 1952, 1969, 1980, and 1991. The following 15 degree-minute quadrangle maps were obtained: “Orestimba”, editions dated 1919 and 1947. An analysis of map details follows.

In the Orestimba quadrangle dated 1919 (Figure 5-10), the City of Patterson is labeled and major streets are demarcated. The streets in the Study Area are already established, as well as a canal system of laterals off of the Main Canal. Several structures are demarcated along each County road. No land uses are indicated using USGS symbology. The Southern Pacific Railroad is shown running along the east edge of Patterson and corresponds to the western boundary of the Study Area. The Varnormer Pumping Station is also demarcated, and at least four circular objects are visible, interpreted as ASTs.

In the Orestimba quadrangle dated 1947 (Figure 5-11), the City of Patterson is labeled and major streets are demarcated. The streets in the Study Area are already established, as well as a canal system of laterals off of the Main Canal. Numerous structures are demarcated along the each County road, especially Walnut Avenue. The only land use indicated is orchard. The Southern Pacific Railroad is shown running along the east edge of Patterson. The Varnormer Pumping Station is also demarcated, and at least four circular objects are visible, interpreted as ASTs.

In the Patterson quadrangle dated 1916 (Figure 5-12), the City of Patterson is labeled and major streets are demarcated. The streets in the Study Area are already established, as well as a canal system of laterals. Numerous structures are demarcated along City roads, and a few on County roads. No land uses are indicated using USGS symbology. The Southern Pacific Railroad is shown running along the east edge of Patterson. The Varnormer Pumping Station is also demarcated, and at least four circular objects are visible, interpreted as ASTs.

In the Crows Landing quadrangle dated 1916 (Figure 5-13), the eastern edge of the City of Patterson is viewable on the left side of this map. City and County roads are demarcated but not labeled. Several structures are demarcated along County roads. No land uses are indicated using USGS symbology. The Southern Pacific Railroad is shown running along the east edge of Patterson. One lateral canal is shown in the Study Area.

In the Patterson quadrangle dated 1953 (Figure 5-14), the City of Patterson is labeled and major streets are demarcated. The streets in the Study Area are demarcated, as well as an expanding canal system of laterals. Numerous schools and churches are demarcated along City roads, and a few on County roads. Two land uses are indicated using USGS symbology: orchards and urban. Much of the Study Area is demarcated as orchard. The Southern Pacific Railroad and Highway 33 are shown running along the

east edge of Patterson. The Varnormer Pumping Station is also demarcated, and at numerous circular objects are visible, interpreted as ASTs. An industrial stack, an unimproved road, and a row of structures south of the unimproved road are also visible. A Farm Labor Center is demarcated on Walnut Avenue.

In the Crows Landing quadrangle dated 1952 (Figure 5-15), the eastern edge of the City of Patterson is viewable in the bottom left corner of this map. County roads are demarcated, as well as the canal system of laterals off of the Main Canal. One lateral canal is shown in the Study Area. Numerous structures are demarcated along County roads, corresponding primarily to rural residences. Orchard is the dominant land use indicated, but not present greatly in the Study Area.

In the Patterson quadrangle dated 1971 (Figure 5-16), the City of Patterson is labeled and indicated in orange and major streets are demarcated. The streets in the Study Area are demarcated, as well Salado Creek and an extensive canal system of laterals. Numerous schools and churches are demarcated along roads. Two land uses are indicated using USGS symbology: orchards and urban. Most of the Study Area is demarcated as orchard. The Southern Pacific Railroad and Highway 33 are shown running along the east edge of Patterson. The Varnormer Pumping Station is also demarcated, and numerous circular objects are visible, interpreted as ASTs. An industrial stack and an unimproved road are also visible. The row of structures south of the unimproved road visible in the 1953 edition is no longer visible in this edition. The Farm Labor Center that was previously demarcated on Walnut Avenue is now replaced with residential housing.

In the Crows Landing quadrangle dated 1971 (Figure 5-17), the eastern edge of the City of Patterson is viewable in the bottom left corner of this map. County roads are demarcated, as well as the canal system of laterals off of the Main Canal. One lateral canal is shown in the Study Area. Numerous structures are demarcated along County roads, corresponding primarily to rural residences. Structures not previously mapped are indicated in purple. Orchard is the dominant land use indicated, and orchard acreage has expanded since the last edition of this map. Three rows of structures are visible adjacent to Las Palmas south of the Study Area.

The most recent quadrangles of the Study Area (Westley 1991, Patterson 1978, Brush Lake 1976, and Crows Landing 1980) were spliced together in Figure 5-18. The City of Patterson is shown in orange, and recently added structures are shown in purple. The Southern Pacific Railroad and Highway 33 are shown on the eastern edge of Patterson. The dominant land use in the Study Area is still orchard. Structures, primarily rural residences, are shown along County Roads. Two lateral canals and Salado Creek run through the Study Area. Varnormer Pumping Station is still demarcated to the north, with the same four circular structures, interpreted as ASTs. A stack is also demarcated.



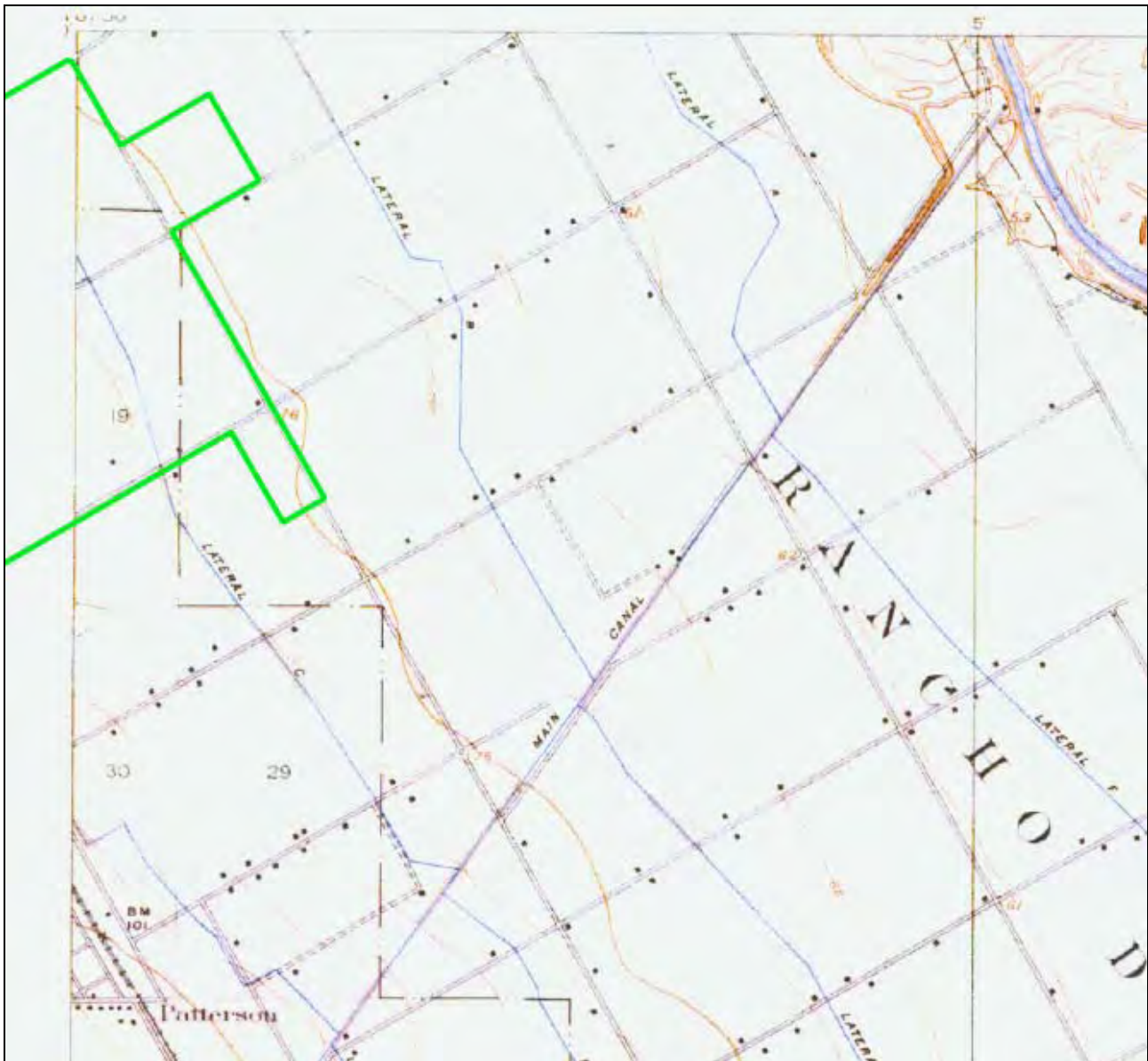
**Figure 5-10. Portion of the Orestimba 15-minute Quadrangle dated 1919
(Study Area Outlined in Green)**



**Figure 5-11. Portion of the Orestimba 15-minute Quadrangle dated 1947
(Study Area Outlined in Green)**



**Figure 5-12. Portion of the Patterson 7.5-minute Quadrangle dated 1916
(Study Area Outlined in Green)**



**Figure 5-13. Portion of the Crows Landing 7.5-minute Quadrangle dated 1916
(Study Area Outlined in Green)**

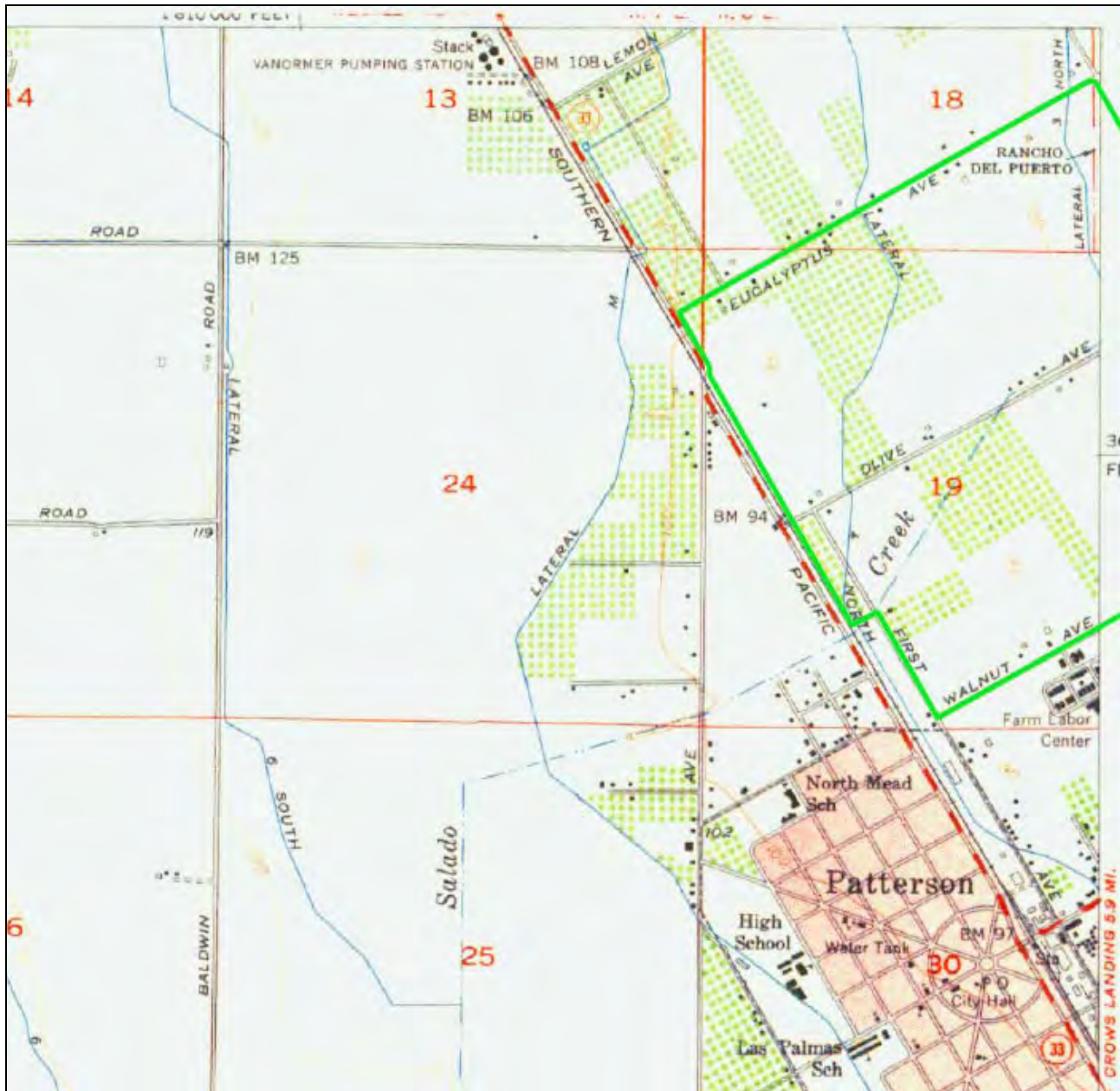


Figure 5-14. Portion of the Patterson 7.5-minute Quadrangle dated 1953
(Study Area Outlined in Green)



**Figure 5-15. Portion of the Crows Landing 7.5-minute Quadrangle dated 1952
(Study Area Outlined in Green)**

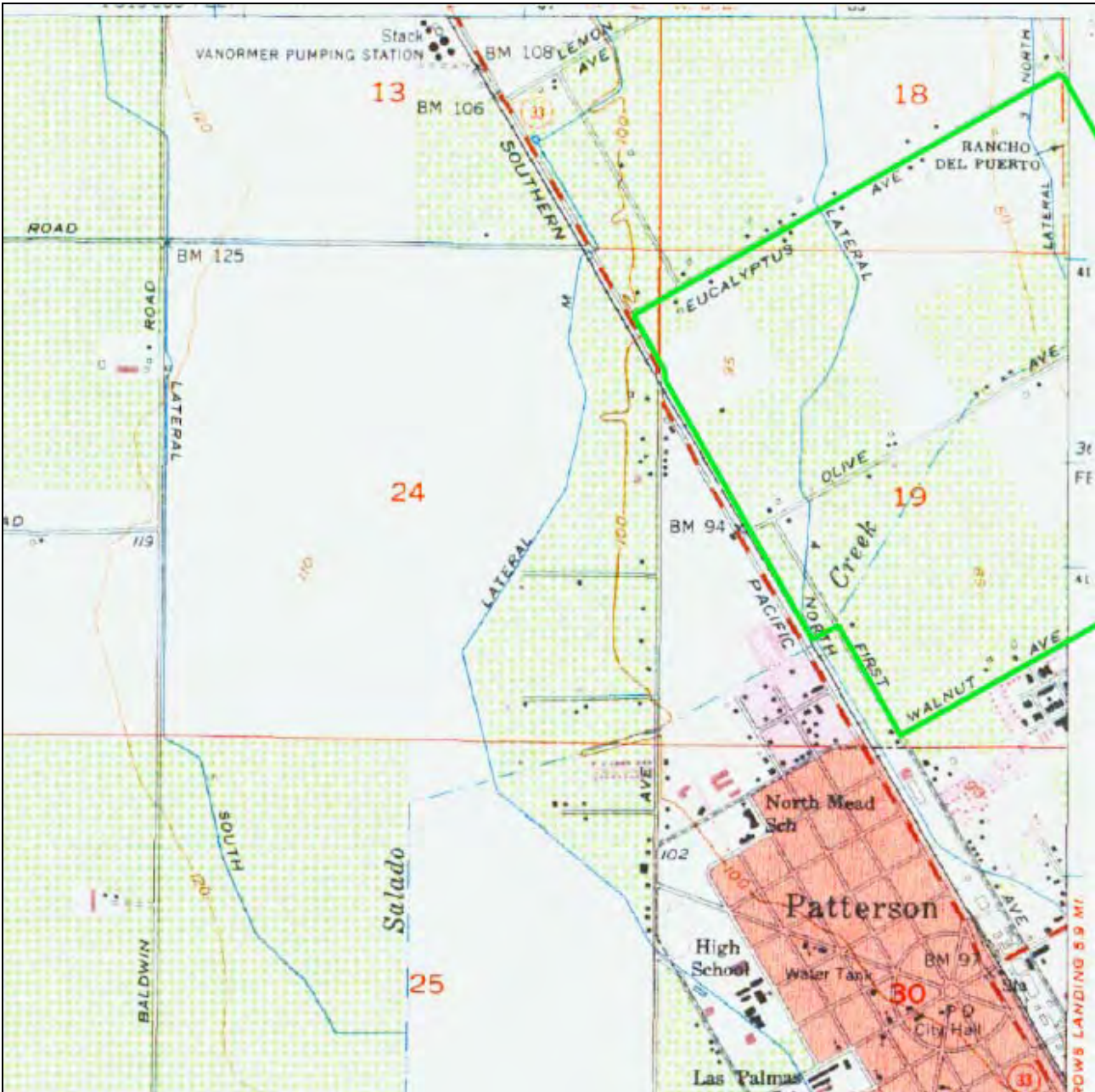
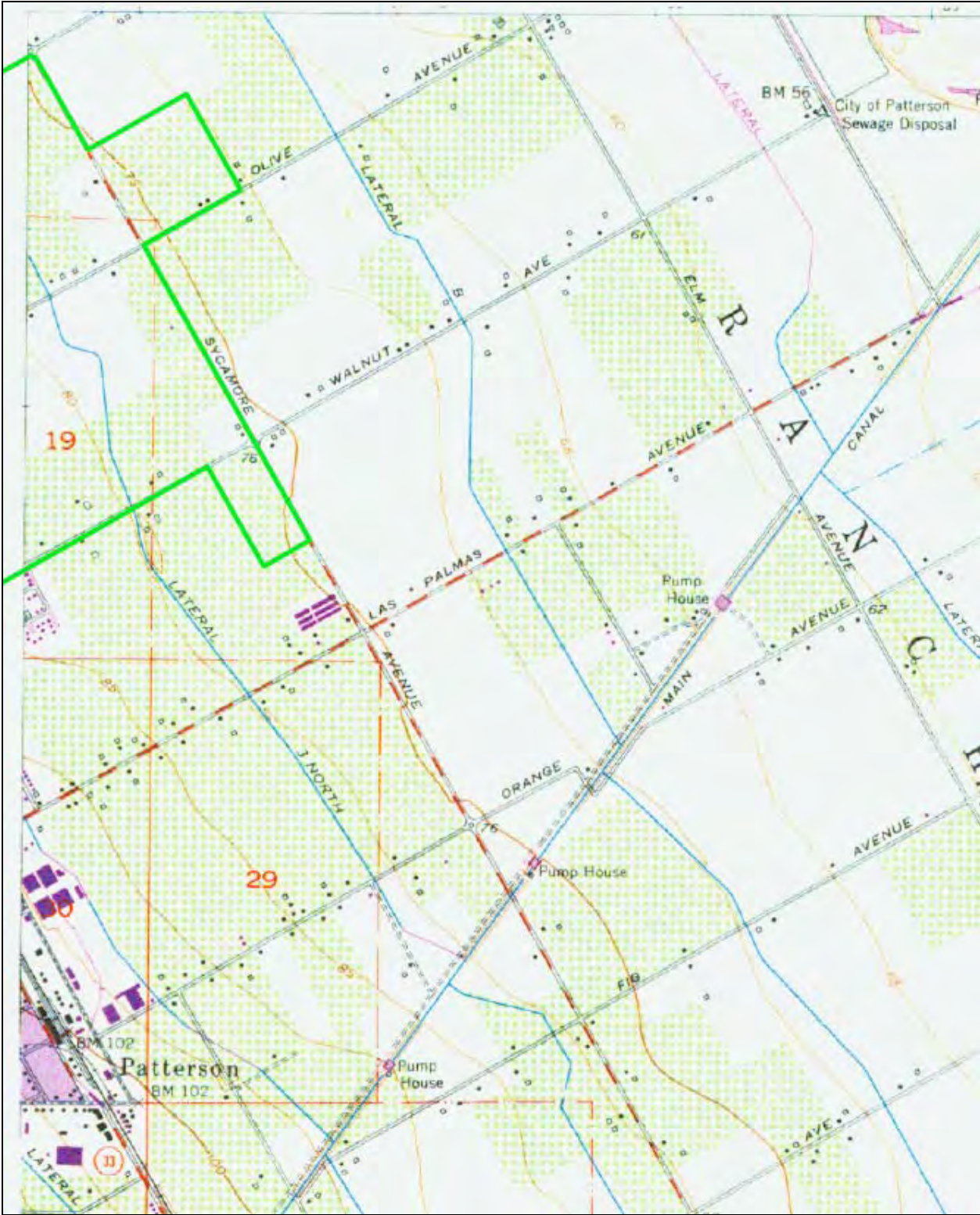


Figure 5-16. Portion of the Patterson 7.5-minute Quadrangle dated 1971
(Study Area Outlined in Green)



**Figure 5-17. Portion of the Crows Landing 7.5-minute Quadrangle dated 1971
(Study Area Outlined in Green)**

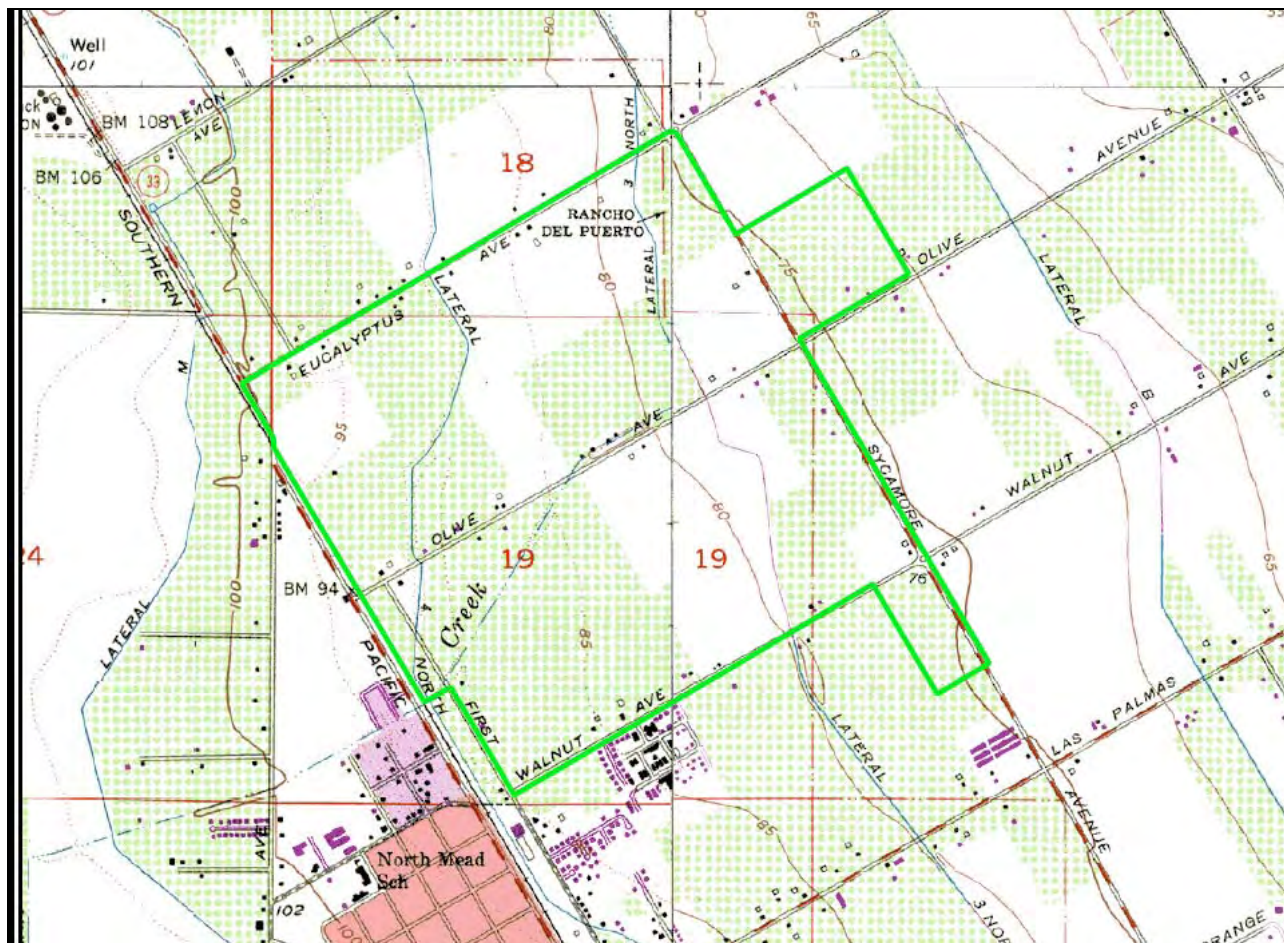


Figure 5-18. Splicing of the Most Recent USGS Topographic Maps (Westley 1991, Patterson 1978, Brush Lake 1976, and Crows Landing 1980) (Study Area Outlined in Green)

5.4.2 Aerial Photography Analysis

Historical aerial photographs of the Study Area were analyzed to determine of the following: current and historical land use; current and historical structures, utilities, and roads; and current or historical drum storage, above ground tanks, pits/ponds/lagoons. Historical aerial photographs were obtained through EDR (see Appendix C-2 for the original photograph scans). This historical aerial photo sequence (Figures 5-19 through 5-26), beginning with 1957, documents changes in land use in the Study Area and immediate from row crop agriculture/pasture to fruit orchards to a gradual increase of rural residence density. However, no visual clues as to any possible recognized environmental conditions were found. The historic aerial photographic sequence is presented next. A recent, high-resolution image of the Study Area is provided in Figure 5-27 and Figure 5-28, prepared by tiling numerous USGS aerial photographs (dated August 16, 1998).

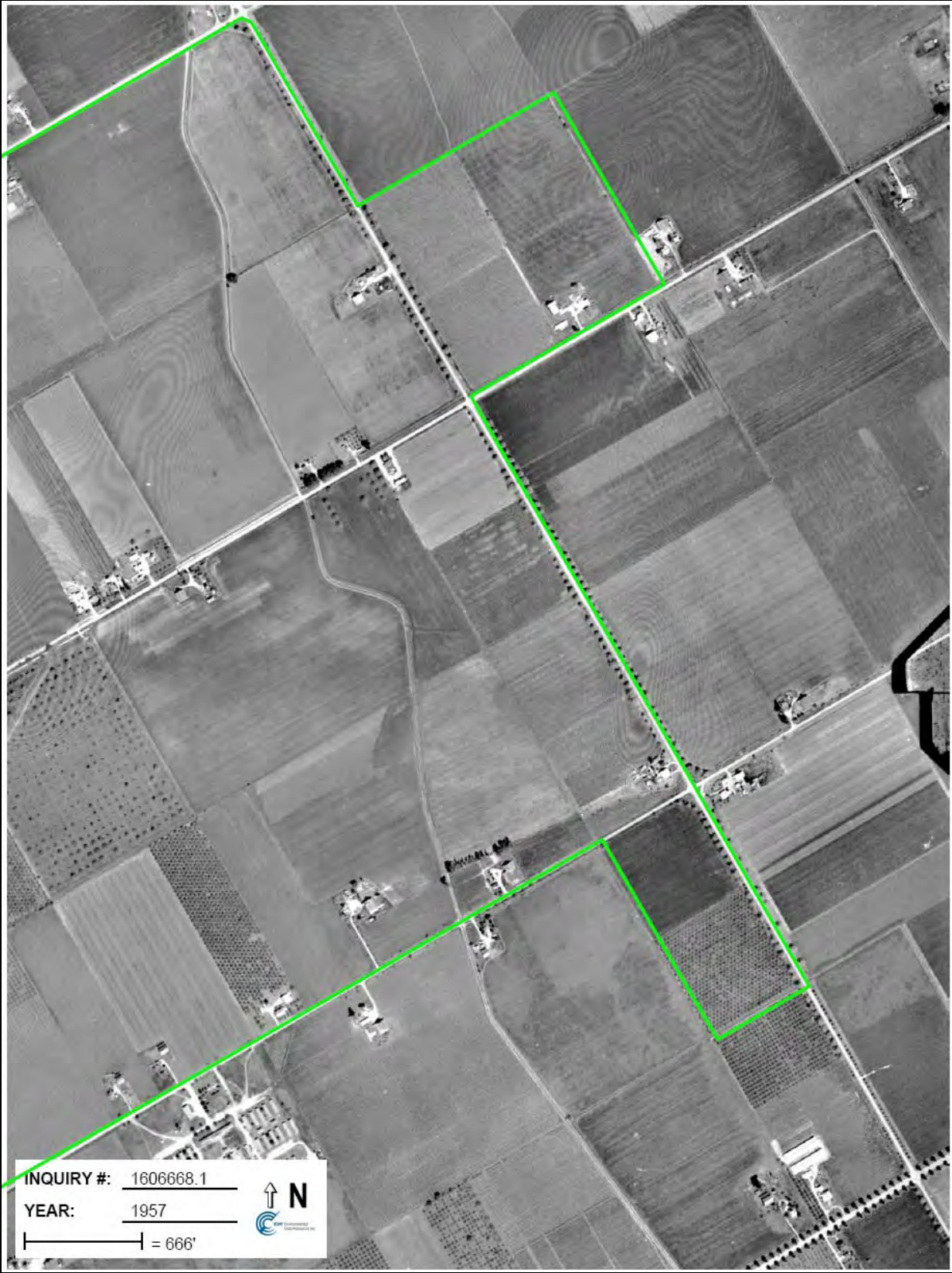


Figure 5-19. Cartwright Aerial Photograph dated 1957 (Study Area Outlined in Green)



Figure 5-20. Cartwright Aerial Photograph dated 1957 (Study Area Outlined in Green)



Figure 5-21. NASA aerial Photograph dated 1974 (Study Area Outlined in Green)



Figure 5-22. NASA Aerial Photograph dated 1974 (Study Area Outlined in Green)



Figure 5-23. WSA Aerial Photograph dated 1982 (Study Area Outlined in Green)



Figure 5-24. WSA Aerial Photograph dated 1984 (Study Area Outlined in Green)



Figure 5-25. USGS Aerial Photograph dated 1993 (Study Area Outlined in Green)



Figure 5-26. USGS Aerial Photograph dated 1993 (Study Area Outlined in Green)



Figure 5-27. Northern Portion of Tiled USGS Aerial Photographs dated August 16, 1998 (Study Area Outlined in Green)



Figure 5-28. Southern Portion of Tiled USGS Aerial Photographs dated August 16, 1998 (Study Area Outlined in Green)

5.4.3 Fire Insurance (Sanborn Company) Maps

Fire insurance maps are historic city and building layout maps produced for private fire insurance companies (primarily the Sanborn Company). These historic city maps can indicate the presence of structures on, or uses of, properties at specified dates. While the geographic coverage of Sanborn Company maps is comprehensive for most large cities, many small towns and rural areas may not be covered. EDR now owns the Sanborn Company, and provides any available fire insurance maps for the target address (in this case, a spatial query of the Study Area). No coverage was available, according to the EDR report. The Sanborn Map inquiry is located in Appendix C-3.

5.4.4 City Directories

City directories have been published for cities and towns across the US since the 1700's. Originally a list of residents, the city directory developed into a tool for locating individuals and businesses in a particular urban or suburban area. Current directories are generally divided into three sections: a business index, a list of resident names and addresses, and a street index. With each address, the directory lists the name of the resident or, if a business is operated from this address, the name and type of business. While city directory coverage is comprehensive for large cities, it may be incomplete or unavailable for small towns and unincorporated, rural areas. The target addresses was the Study Area (in this case, a spatial query of the Study Area). EDR found no listings in City Directories (primarily Polk's City Directory) for this Study Area (Appendix C-4). Adjacent properties were queried using a range of addresses on the bounding streets. The majority of addresses were either not listed or listed as residences. On North 1st Street (14506-14808 range), there were no returns, except one for Polk's City Directory Year 2005: "Technical Structures Inc" on 14601 North 1st Street. On Eucalyptus Avenue (150-724 range), only residences were returned. On Olive Avenue (137-343 range), all of the addresses were residences, except for two businesses listed in Polk's City Directory Year 2000: – "*Shimmon Irrigation*" at 138 Olive Avenue, and "*Alberta Equipment Service*" at 343 Olive Avenue. Later, in Polk's City Directory Year 2005, these businesses are listed again, and one additional business - "*Vinyl Fence Co.*" at 138 Olive Avenue.

5.5 **Historical Use Information on Adjoining Properties**

Historical use information on adjoining properties is summarized in other sections of this report.

5.6 **Other Sources**

On February 6, 2006, the Patterson Branch of the Stanislaus County Library was visited, and the Library Online Catalog and environmental records shelves were searched, with the assistance of Librarian Darrielle Rogers. Electronic queries of the library catalog and Newspaper Indexes database (both on the Dynix System) were performed, using keywords such as "*spill*", "*contamination*", "*hazardous waste*", etc. Microfiche of local newspapers, primarily the Patterson Irrigator, were inspected. The local historical society publication "*The Gateway: A Patterson Township Historical Society Bulletin*" (biannual, est. 1978) was also searched. Photocopied documents are presented in Appendix C-5) and topics summarized in the following text:

- PRC; potential hazardous waste site reported in 1984; report of stormwater discharge violations in 1993 and resulting court actions and bankruptcy of PRC in 1997; USEPA tested oil wastes in 1998 to determine disposal options; report of removal of waste oil in 1998.
- Five sites contaminated with methyl-tertiary butyl ether (MTBE), a gasoline additive, in Patterson reported in 1999, but City Manager states not a threat to City's wells.

6.0 SITE RECONNAISSANCE

6.1 Methodology and Limiting Conditions

The ASTM (2000) explains that, "*The objective of the site reconnaissance is to obtain information indicating the likelihood of identifying recognized environmental conditions in connection with the property*" (page 14, ASTM, 2000). The site reconnaissance is limited to visual and/or physical observation of the exterior and interior of the Study Area and its improvements, the past and current uses of the properties and adjoining properties, and the condition of the properties. The Site Reconnaissance attempted to evaluate the Study Area and neighboring properties for potential hazardous substances use, storage, and disposal, including the presence of tank and drum storage, PCB-containing transformers or electrical equipment, and /or evidence of soil staining, stressed vegetation, ponds, pits, sumps, suspicious odors, fill and depressions, or any other condition indicative of potential contamination. On February 6, 2006 and March 1, 2006, Dr. Graening (Registered Environmental Assessor I, Natural Investigations Co.) and Tina Cox (Engineer, Brown and Caldwell) performed a Site Reconnaissance of the Study Area. All accessible portions of the Study Area were observed by a pedestrian survey, and adjoining properties were observed by a driving survey. Properties where landowner permission was not obtained were excluded from the pedestrian survey. Interior observations were limited to those non-residential structures where access was granted. Photographic documentation accompanies the following summary of the Site Reconnaissance (additional photographs are included in Appendix D).

6.1.1 Roads

County Roads in the Study Area (Olive Avenue, Sycamore Avenue, Eucalyptus Avenue, First Street, and Walnut Avenue) are paved with asphalt. Some private drives are paved in asphalt, while others are graveled.

6.1.2 Potable Water Supply

No public potable water supply systems are currently available for the Study Area. Residences in the Study Area obtain potable water from private groundwater wells. Irrigation water for agricultural purposes is provided by the Patterson Irrigation District.

6.1.3 Sewage Disposal System

No public sanitary sewer system is currently available for the Study Area. Residences in the Study Area rely upon private septic systems (anaerobic settling tanks and leach fields). The City of Patterson owns and operates a sewer main under Walnut Avenue. This sewer main continues on to the City of Patterson Sewage disposal ponds, which are located approximately two miles northeast of the Study Area.

6.1.4 Storage Tanks and Drums

Various fuel storage tanks exist within the Study Area, as documented in Section 5.0. Numerous storage tanks and drum storage were sighted during the site visits. The following list summarizes these storage structures, and photographs provide examples of these hazardous substances storage facilities.

- Propane ASTs are associated with almost every residence in the Study Area; the largest AST was observed at Shimmon Pipe Company (APN 047-031-039) (Figure 6-1).
- APN 047-031-023, 900 Olive; two USTs, unknown size and contents, abandoned in place by previous landowner, reported by Darryl Dennis on a March 1, 2006 interview; Mr. Dennis removed fill pipes, and one pump hauled off and disposed (Figure 6-2 and Figure 6-3).
- APN 047-014-015, Alves Farm, address opposite 724 Eucalyptus (outside Study Area); permission to enter the land was not obtained; at least two ASTs were visible from the County Road; also visible was a pressure tank mounted on a stand that appeared to be a trash incinerator (Figure 6-4).
- 150 Eucalyptus Avenue (APN 047-025-035), one AST in shop (Figure 6-5) and one AST in refuse pile (Figure 6-6).
- Rodrick Farm, 14313 Sycamore Avenue (APN 047-025-019), one fuel AST and shed (Figure 6-7).
- 14955 Sycamore Avenue (APN 047-031-013), two ASTs (Figure 6-8);
- Filice's property, 343 Olive Avenue (APN 047-025-014), with three ASTs visible in pole barn (Figure 6-9)
- 14955 Sycamore (APN 047-031-013), no permittable entry, locked gate; walked perimeter of site; observed two ASTs and at least eight 55-gallon drums, plus two 55-gallon drums used for trash; drum storage (Figure 6-10).



Figure 6-1. View Looking Southeast, Large Propane Tank and Repair Shop (APN 047-031-039)



Figure 6-2. View Looking East of Approximate UST Location (APN 047-031-023)



Figure 6-3. View Looking East of Second Approximate UST Location (APN 047-031-023)



Figure 6-4. View Looking Northwest of Farm Buildings with ASTs and Possible Incinerator (APN 047-014-015)



Figure 6-5. View Looking East of AST and Shop (APN 047-025-035)



Figure 6-6. View Looking North at Same AST in Shop and One Beyond (APN 047-025-035)



Figure 6-7. View Looking North of Fuel AST and Shed (APN 047-025-019)



Figure 6-8. View Looking South of Two ASTs (APN 047-031-013)



Figure 6-9. View Looking East of Filice's Property, with 3 ASTs Visible under Pole Barn (APN 047-025-014)



Figure 6-10. View Looking Southeast of Drums and other Scrap Metal (APN 047-031-013)

6.1.5 Hazardous Substances and Petroleum Products

Various hazardous substance and petroleum product usage exists within the Study Area, as documented in Section 5.0. The following list and accompanying photographs provide examples of facilities that utilize hazardous substances and petroleum products.

- Trailer-mounted water pumps at APN 047-031-039 (Figure 6-11); mobile fuel tank and storage shed at APN 047-031-02 (Figure 6-12); and excavator and trailer with fuel pump & tank at APN 047-025-022) (Figure 6-13).
- Fertilizer AST at APN 047-025-019 (Figure 6-14).



Figure 6-11. View Looking West of Mobile Water Pump and Tank (APN 047-031-039)



Figure 6-12. View Looking South of Mobile Fuel Tank and Storage Shed (APN 047-031-02)



Figure 6-13. View Looking South of Excavator and Trailer with Fuel Pump & Tank (APN 047-025-022)



Figure 6-14. View Looking North at Fertilizer AST, Shed to Left, Orchard in Background (APN 047-025-019)

6.1.6 PCB-Containing Equipment

No PCB-containing equipment (electric or hydraulic) was observed during the site reconnaissance. Pole-mounted transformers were observed in the Study Area, but appear to be modern and non-leaking. Numerous abandoned or unused hydraulic equipment, such as bulldozers and backhoes, were observed within the Study Area. No cases were found by Stanislaus County EDR in the federal PCB Activity Database System. Electricity is provided by Turlock Irrigation District.

6.1.7 Pits/Ponds/Lagoons

No pits, ponds, or lagoons were observed during the site reconnaissance.

6.1.8 Storm Water

No public stormwater sewer system exists in the Study Area. The City of Patterson owns and maintains a detention basin (APN 047-026-025), located on Olive Avenue east of Sycamore.

6.1.9 Solid Waste

Municipal solid waste generated in the City of Patterson is collected and hauled by the City's contractor – Waste Management Corporation. Outside the corporate boundary, private companies handle refuse collection and disposal - Bertolotti Disposal Company is often used. Some residential parcels in the Study Area have extensive piles of refuse or discarded/abandoned materials or equipment as listed below.

- APN 047-031-024, 14561 Sycamore - has refuse and drum storage (Figure 6-15).
- 14712 North First Street (APN 047-031-033) - two residences, uninhabited; shop (or detached garage) contained refuse, refrigerator, paint cans, pressurized tanks, 5 gallon containers, several 20-gallon drums; junkyard in back behind shop, had one 55-gallon drum and large equipment (Figure 6-16, Figure 6-17, and Figure 6-18).
- 14955 Sycamore Avenue (APN 047-031-013) - observed were at least eight 55-gallon drums, plus two additional 55-gallon drums used for trash (Figure 6-19).
- 14619 Sycamore Avenue (APN 047-31-38) - abandoned agricultural equipment and refuse piles (Figure 6-20).



**Figure 6-15. View Looking South of Refuse and Drum Storage
(APN 047-031-024)**



Figure 6-16. View Looking East of Shop with Refuse (APN 047-031-033)



Figure 6-17. View Looking South, Forklift (APN 047-031-033)



Figure 6-18. View Looking South of Refuse Behind Shop (APN 047-031-033)



Figure 6-19. View Looking Southeast of Drums and Other Scrap Metal (APN 047-031-013)



Figure 6-20. View Looking Northwest of Abandoned Agricultural Equipment and Refuse (APN 047-31-38)

7.0 INTERVIEWS

The ASTM explains that, "*The objective of interviews is to obtain information indicating the likelihood of identifying recognized environmental conditions in connection with the property*" (page 16, ASTM, 2000). The following text summarizes interviews performed by Dr. Graening (Natural Investigations Co.), and mail and e-mail transcripts are found in Appendix E-1.

7.1 Interview with Owners/Site Managers/Occupants

An attempt was made to interview every person associated with parcels in the Study Area during the Site Reconnaissances. The following text summarizes key interviews with property owners, site managers, or occupants:

- John Ramos, February 6, 2006. Mr. Ramos is the owner of Ramos Investments, Inc. (a VOP development partner) and a landowner who owns multiple parcels in the Study Area and in the City. Mr. Ramos stated that there was no hazardous substances usage on the parcels that he owns, but he knew of several parcels that probably historically used, or are now using, fuel ASTs: the Alves Farm (APN 047-025-06 or off of the Study Area on APN 047-014-015); the parcels acquired by the School District (047-031-017 and 047-031-016); the Alberta Farm (parcel 047-025-014); and the Ramirez parcel (047-031-034).
- Joe Hollowell, February 6, 2006. Mr. Hollowell is the owner of Terra Firma Entitlement Company LLC (a project development partner). Mr. Hollowell had no specific information about site, but he did provide a Phase I ESA by Condor Earth Technologies, Inc. (2005) for the school parcels. Mr. Hollowell guided Dr. Graening in an orientation of the Study Area by car.

- Thomas Keller, March 4, 2006. Mr. Keller is Mayor of Patterson and owner of two Study Area parcels (APN 047-031-039 and 047-031-02). Mayor Keller responded by phone (209.892.5555) on March 4, 2006. Mayor Keller has lived in Patterson since 1959. Mayor Keller had no knowledge of train derailments and no knowledge of USTs on either parcel during almost 50 years of ownership. Mayor Keller stated that APN 047-031-039 originally was an apricot orchard, which was removed in 1974. This parcel was then used as apricot drying yard and cold storage facility. Later it was leased to trucking company for two years in 1980s, who used lot for staging and dispatching of trucks and equipment, but no on-site fueling. Mayor Keller now leases the parcel to Shimmon Pipe Company and Vinyl Fence Company. On the other parcel (14506 North First Street, APN 047-031-02), Mayor Keller stated that one AST exists at the barn- a fuel tank/pump system for a pick-up truck that is no longer used. These parcels were visited on March 1, 2006. The leasees of 14506 North First Street (names not given) were questioned briefly regarding hazardous materials issues. The leasees had no knowledge of storage or use of hazardous materials other than the mobile fuel tank identified by Mayor Keller.
- Steven Hall, March 4, 2006. Marshall Hall is a Fire Marshall with West Stanislaus County Fire Protection District, and lives at 14701 Sycamore (near corner with Olive). Marshall Hall responded by phone, stating that he had no knowledge of hazardous materials release or emergency responses on his property or in the Study Area.
- Jim Bland, March 1, 2006. Mr. Bland, Manager of Shimmon Irrigation Co. (APN 047-031-039), was interviewed, and he stated that he had no knowledge of any former spills or releases on the parcel. Mr. Bland stated that the parcel was previously operated as a trucking company, and prior to that time, a cold storage facility. During the site reconnaissance, three propane ASTs and four trailer water pumps with diesel-fueled generators were observed. Also on the parcel were approximately eight 55-gallon drums and welding gas cylinders.
- Ms. Filice, March 1, 2006. The Filice Family lives at 343 Olive Ave (APN 047-025-014). Ms. Filice was interviewed, and she stated that there was no current gasoline or diesel storage or usage. Permission was not granted to enter the property. From the adjoining lot, the backyard of the Filice's property was visible; in the pole barn in backyard of 343 Olive Ave., three ASTs were observed.
- Tenant, March 1, 2006. On the parcel owned by the Ban Family (APN 047-025-023), the tenant was interviewed (name not given). The tenant stated that he had no knowledge of hazardous materials usage other than propane.
- Tenant, March 1, 2006. On the parcel owned by the Drew Family (APN 047-025-013, 613 Olive Avenue), the tenant was interviewed (name not given). The tenant said that the only tank on the property was propane for residential use. The tenant said that the neighboring fields owned by the Alberta Family have been leased to the Alves Family for farming for many years.
- Darryl Dennis, March 1, 2006. Mr. Dennis owns the property at 900 Olive Avenue (APN 047-031-023). Mr. Dennis stated that a previous landowner left two USTs abandoned in place. Later, the fill pipes and a pump were removed and hauled off the property.

- Tenant, March 1, 2006. On the parcel owned by the Rodrick Family (APN 047-025-019; 14313 Sycamore Avenue), the tenant was interviewed (name not given). The tenant stated that one fuel AST and one fertilizer AST were on the property, used for the orchard.
- Mrs. Shali, March 1, 2006. Mrs. Shali lives at 14619 Sycamore Avenue (APN 047-031-038 and 047-031-932). Mrs. Shali stated that she had no knowledge of former hazardous material storage or usage and no current usage or storage on the property.
- Tenant, March 1, 2006. The tenant residing at APN 047-031-018 on Walnut Avenue was interviewed; the tenant stated that he had no knowledge of hazardous material storage or usage on the property.

7.1.1 Landowner Questionnaire of Hazards/Hazardous Substances

A cover letter and Landowner Questionnaire of Hazards / Hazardous Substances were mailed to the landowner of each parcel (56 total Questionnaires) in the Study Area by US Post (certified, return signature request) on February 21, 2006 (Appendix E-2). The cover letter notified each property owner that a Phase I ESA was being performed on their property, that site access was requested, and that site information and interviews were requested, either by interview or by filling out the Questionnaire. Fifty-one certified signatures receipts were received. Thirty-four (of the fifty-six) Questionnaires were completed (Appendix E-2). Almost all respondents stated that their property's water source originated from a private well or a public water supply (Patterson Irrigation District) and that a septic system handled wastewater. All other hazards / hazardous substances usage questions were answered "no" except for the following items.

- Arthur Filice, 261 Olive Avenue, (APN 047-025048) answered "yes" to knowledge of historic hazardous material storage and storage tanks, but gave no specifics.
- David Keller, 14506 North First Street, (APN 047-031-02), responded "yes" to current tank storage, noting that there was one "130 gallon above ground diesel tank, formerly mounted on truck."
- Dan Rodrick, 14313 Sycamore Avenue (APN 047-025-019), did not answer the question regarding current AST or UST storage.
- David Keller, 14601 North First Street (APN 047-031-039), responded "yes" that the parcel was used for an industrial purpose (Vinyl Fence Company), that the property had historically been used for industrial purposes, writing "Trucking Company, no fueling facility; Apricot Dry Yard and Real Estate Office," Mr. Keller answered "unknown" for questions regarding current hazardous substance storage, drum storage, or electrical transformers.
- Juan Mejia, 14955 Sycamore Avenue (APN 047-031-013) responded "yes" to current tank storage, reporting that he has two ASTs on the property on concrete pads that are currently empty; Mr. Mejia also responded "yes" to hydraulic equipment, reporting that he has two tractors on the property.

7.2 Interviews with Local Government Officials

7.2.1 City of Patterson

The City of Patterson administrative offices was visited on February 6, 2006. Sylvia Whitford, Public Works Department employee (33 South Del Puerto Avenue, Patterson CA 95363; phone: 209.892.2041 x 112) answered questions regarding utilities in the Study Area. Ms. Whitford stated that the city sewer line along Walnut Avenue extending to Poplar Avenue, but that the Study Area was on septic systems. The City's stormwater sewer system is partially in the Study Area. Electricity is provided by Turlock Irrigation District, and PG & E provides natural gas to the City, but not to residents in the Study Area, which must rely on their own propane tanks. The Study Area is not on the City's water supply system, but on well water. With the City, municipal solid waste pick-up and disposal is contracted out to Waste Management, Inc., and outside the corporate boundary, Bertolotti Disposal Company (209.537.8000) is often used. Ms. Whitford stated that building permits are not with the City because the Study Area is not incorporated, and deferred this request to Stanislaus County. A phone message and e-mail were left with Rod Simpson, Planning Director (209.892.2041 x 113; planning@ci.patterson.ca.us) on February 23, 2006. Mr. Simpson responded by phone on March 4, 2006. Mr. Simpson stated that he had no specific knowledge of hazardous materials usage or storage in the Study Area and referenced to the Stanislaus County DER for more information. The Mayor of Patterson, Thomas Keller, was also interviewed, and discussed previously in Section 7.1.

7.2.2 County of Stanislaus

7.2.2.1 Department of Environmental Resources

A records request was e-mailed to Jim Simpson, Manager of the Hazardous Materials Division, on January 31, 2006. Mr. Simpson responded by e-mail on February 1, 2006, assigning Nicole Damin to assist. Ms. Damin referred the request to Vicky Jones, REHS, Hazardous Materials Specialist (3800 Cornucopia Way, Suite C, Modesto CA 95358; phone 209.525.6710). Ms. Jones was contacted at her office on February 7, 2006. Ms. Jones searched the Stanislaus County DER electronic database by street name for all cases in the vicinity of the Study Area – these cases are summarized in Section 5.2.3. The Old Valley Pipeline was also discussed. Natural Investigations Co. also spoke with Dr. Horacio Ferriz, Professional Geologist, was contacted regarding the VOP Project. Dr. Ferriz was asked if Stanislaus County DER routinely required soil testing for pesticides in agricultural areas. Dr. Ferriz said that this was not normally required, and that any residual pesticides from normal pesticide application would normally be eradicated during grading and development. Dr. Ferriz did state that pesticide handling areas might warrant investigation. Charmaine Champagne, File Clerk (209.525.6797), pulled files for review. Case file review was performed on February 7, 2006 (see Section 5.2.3 for a summary). Contemporary Legal Service (209.551.0440) was retained to copy files. A follow-up interview was performed by phone with Ms. Jones on February 16, 2006. Ms. Jones stated that she did not know of any environmental issues regarding SPRR in the Study Area or vicinity, only in eastern part of the County. Ms. Jones referenced to Mike Smith at the CVRWQCB for inquiries at the state level regarding the Study Area. Additional file reviews were arranged by phone with Ms. Champagne on February 16, 2006. A third records review was initiated at Stanislaus County DER on March 16, 2006 to determine the status of reported fuel tanks on particular parcels and to determine any relationship between PRC and the FUDS program at 13331 Highway 33. This file review was performed on April 10, 2006.

7.2.2.2 Other County Offices

On February 6, 2006, James Kinnear, Fire Chief, (344 West Las Palmas Avenue, Patterson CA 95363, phone: 209.892.5621) was contacted at the West Stanislaus County Fire Protection District. Chief Kinnear did not know of any hazardous materials releases or emergency responses in the Study Area, and referenced the Stanislaus County DER for information. Steve Logan at the Stanislaus County Agricultural Commissioner's Office (209.525.4730) was contacted about the Study Area on March 15, 2006. Mr. Logan faxed the data request form to initiate the file review process. All files were requested to be inspected of agricultural chemical/pesticide permits and usage and storage in the Study Area. Results of this data query are presented in Section 5.2.4.

7.2.3 California Regional Water Quality Control Board

The CVRWQCB was contacted on February 16, 2006. Mr. Smith responded by phone on February 21, 2006, stating that he had no knowledge of any active cases in the Study Area where the CVRWQCB was the lead. Other information is summarized in Section 5.2.1.

7.2.4 California Department of Toxic Substances Control

A records request was faxed on February 17, 2006 to DTSC. Bobbi Jenson, Records Coordinator, responded by mail on February 21, 2006, stating that no DTSC records existed for the Study Area (Appendix E-1).

7.2.5 Other Interviews

Old Valley Pipeline Inquiries. A letter was mailed on February 17, 2006 to Robert Mihalovich, a project administrator at Chevron Environmental Management Company (P. O. Box 6012, San Ramon, CA 94583), inquiring about the Old Valley Pipeline alignment and possible effects on the Study Area. A phone message was left on February 24, 2006 with Penny Fottrell, Environmental Project Manager, ChevronTexaco (phone: 925.842.5216; fax 925.842.0213). Caryl Weekley, a SAIC on-site consultant to Chevron (925.842.1343), responded by phone on February 27, 2006. Ms. Weekley confirmed that the Old Valley Pipeline alignment was in the SPRR right-of-way, between the rail lines and Highway 33. Ms. Weekley requested Study Area map and stated that she would look into the matter. A Study Area map was e-mailed to her that same day (cweekley@chevron.com). Ms. Weekley confirmed by e-mail on February 27, 2006 that the "*Vanormer Pumping Station*" labeled on topographic maps was a former Old Valley Pipeline pumping station. Ms. Weekley was contacted again on March 8, 2006. Ms. Weekley stated that Chevron Environmental Management Company would contact Terra Firma Entitlement Company LLC regarding the matter.

The address of the Vanormer Pumping Station/PRC – Patterson site (13331 Highway 33) is also listed as a FUDS in several databases (see Section 5.0). On February 23, 2006, a phone message was left and also an e-mail to Gerald Vincent, FUDS Program Manager, US Army Corps of Engineers (gerald.e.vincent@usace.army.mil; phone: 916.557.7452), requesting information on this FUDS record. The request was reiterated by e-mail and phone on March 22, 2006. Mr. Vincent responded on April 6, 2006 that the FUDS Program does not list this site in their database. Potentially Responsible Parties apparently did not involve DoD in this case.

Union Pacific Railroad Inquiries. Note that in topographic maps and other records Southern Pacific Railroad Company is indicated; Union Pacific Railroad Company (UPRR) acquired Southern Pacific Railroad Company in the 1990s. Phone messages were left on February 17, 2006 with Brock Nelson, UPRR Director of Environmental Field Operations Western Region (916.789.6370) and Mike Grant, Manager Environmental Site Remediation Northern California (415.541.7021), inquiring about hazardous materials issues in relation to the Study Area. Mr. Grant returned the call on February 21, 2006, stating that any hazardous materials stored by UPRR were under permit and on file with each county of occurrence. Mr. Grant did not know of any derailments or releases in the Patterson area; he suggested contacting the Stanislaus County DER for information. Mr. Nelson returned the phone call on February 27, 2006 and stated that he had no specific knowledge of site or hazmat issues; he suggested contacting the state or county agencies for information and to the UPRR Real Estate Division for access issues.

8.0 FINDINGS

The Study Area is located in an area that has at least 100 years of historical usage of hazardous materials and petroleum products, primarily in the agricultural and energy industries. Evidence from records research, site reconnaissance, and interviews has determined that the Study Area is subject to known recognized environmental conditions (*de minimis*, historical, and current). These environmental conditions are discussed next.

8.1 *De Minimis* Environmental Conditions

De minimis environmental conditions are conditions that are not believed to present a material risk of harm to public health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies (ASTM, 2000). It is Brown and Caldwell's opinion that there are several minimal, or *de minimis*, conditions pursuant to the ASTM standard:

- Within the Study Area, there are numerous properties that have refuse piles and structures that should be properly disposed of in an appropriate landfill.
- Within the Study Area, there are numerous entities that currently use or store hazardous substances or petroleum products, as discussed previously in this report. Because the use of hazardous materials by these businesses is controlled by local, state, and federal laws, because these businesses have Hazardous Materials Management Plans and Material Safety Data Sheets on file with Stanislaus County DER, and because Stanislaus County DER performs annual inspections of each business in the Study Area, these environmental conditions are considered a *de minimis* risk to public health and the environment. The exception is properties containing USTs and/or ASTs. Specific examples of these entities and their known hazardous substances or petroleum products usage includes the item.
 - Victor Hugo Mena, 300 Olive Avenue, registered historic disposal of laboratory waste chemicals.
- Within the Study Area, there are numerous properties that have potable water wells. If these wells are not properly abandoned, they could interfere with proposed grading and development activities.

- Within the Study Area, there are numerous properties that have septic systems. If these septic systems are not properly abandoned, they could interfere with proposed grading and development activities.

8.2 Historical Recognized Environmental Conditions

It is Brown and Caldwell's opinion that there is one historical recognized environmental condition pursuant to the ASTM standard as described below.

- Petroleum Recycling Corporation – Patterson. This Superfund Site is located topographically cross-gradient to the Study Area and less than one mile away. Significant quantities of waste oil and other petroleum products were stored at this property and improperly treated or disposed. Groundwater and soil contamination was confirmed. Furthermore, discharge of contaminated stormwater was documented in the past. The USEPA oversaw remedial activities and the case is now in a monitoring phase. Inferred groundwater flow direction from this site is northeast, and not towards the Study Area.

8.3 Recognized Environmental Conditions

It is Brown and Caldwell's opinion that there are four current recognized environmental conditions pursuant to the ASTM standard:

- Possible soil contamination along the western boundary of the Study Area from petroleum products from the Chevron (Standard Oil) Old Valley Pipeline. Records research and interviews determined that the Old Valley Pipeline alignment occurs adjacent to the Study Area in the UPRR rail right-of-way, and that at least three cases of soil contamination by crude oil release have occurred within one mile of the Study Area. It is Brown and Caldwell's opinion that the proximity of the pipeline and contaminated sites constitutes a recognized environmental condition pursuant to the ASTM standard. Further investigation of possible soil contamination by petroleum hydrocarbons of Study Area parcels adjacent to the railroad right-of-way is recommended.
- Likely presence of permitted, unpermitted, or abandoned storage tanks in the Study Area. Records research, interviews, and Site reconnaissance have determined that ASTs and USTs were in place, or are still in place, on several properties within the Study Area. However, no specific evidence of contamination was found in this assessment. All ASTs and USTs would need to be removed before grading or development activities began. Additional investigation may be warranted for some or all of the properties found to contain ASTs or USTs for possible soil contamination by petroleum hydrocarbons. These properties include:
 - 900 Olive Street (APN 047-031-023) – two unpermitted USTs (unknown size and contents, abandoned in place) are suspected to exist underground.
 - Alves Farming, 524 Eucalyptus Avenue (APN 047-025-005) – current use of two USTs (550-gallon diesel and 550-gallon gasoline). The address opposite 724 Eucalyptus (APN 047-014-015) (outside Study Area) - historic use or storage of one 300-gallon gasoline AST, one 500-gallon gasoline tank, one 500-gallon diesel tank, and one 55-gallon waste oil drum, with at least

two ASTs visible from the County Road, as well as a pressure tank mounted on a stand that appeared to be a trash incinerator.

- Farm of Leland Thorkelson, 260 Olive Avenue (APN 047-031-036) – historic or storage use of 300-gallon diesel container (unspecified).
- Farm of Art Filice Jr., 261 Olive Avenue (APN 047-025-014) – historic use or storage of two ASTs (300-gallon diesel and 200-gallon gasoline), and 55-gallon drum of hydraulic oil and drum of motor oil; visual inspection indicated three ASTs not currently in use.
- Farm of John and Anthony Ban, 342 Olive Avenue (APN 047-031-006) – historic use or storage of one 525-gallon gasoline UST.
- Farm of Clarence Rodrick, 513 Walnut Avenue (APN 047-025-019) – Hazardous Materials Farm Plan Inventory Certificate, dated 2003, lists one 350-gallon gasoline UST.
- Boone Bros., 14701 Sycamore Avenue (APN 047-031-037) – historic record of 400-gallon diesel tank in the State’s SWEEPS database, Stanislaus County DER has no records at this address.
- 14955 Sycamore Avenue (APN 047-031-013) – observed two ASTs and at least eight 55-gallon drums, plus two 55-gallon drums used for trash; drum storage.
- 150 Eucalyptus Avenue (APN 047-025-035) – one AST in shop and one AST in refuse pile.
- Note also that propane ASTs are associated with almost every residence in the Study Area; the largest AST was observed at Shimmon Pipe Company (APN 047-031-039). All of these tanks would need to be properly abandoned and removed before grading or construction occurs.
- Possible presence of hazardous substance contamination from unlabeled drum storage and refuse piles at the following parcels.
 - 14561 Sycamore Avenue (APN 047-031-024) – has refuse and drum storage.
 - 14712 North First Street (APN 047-031-033) – has shop (or detached garage) that contained refuse, refrigerator, paint cans, pressurized tanks, 5-gallon containers, several 20-gallon drums, and junkyard behind shop had one 55-gallon drum and large abandoned equipment.

- 14955 Sycamore Avenue (APN 047-031-013) – observed were at least eight 55-gallon drums, plus two additional 55-gallon drums used for trash.
- 14619 Sycamore Avenue (APN 047-31-38) – has abandoned agricultural equipment and refuse piles.
- Likely presence of residual pesticides, especially in pesticide handling areas of farm operations, and the potential for pesticide contamination of soil or groundwater. Within the Study Area, numerous agricultural enterprises have historically stored, handled, and applied pesticides on row crops or orchards. Pesticide (and/or heavy metal) residues may persist in Study Area soils. However, this assessment found no specific indication of soil or water contaminated with pesticides, other than that reported by Condor Earth Technologies, Inc. (2005) on a parcel (APN 047-031-017) excluded from this Phase I ESA. Properties that may require additional investigation are listed below.
 - APN 047-031-017 – Condor Earth Technologies, Inc. (2005) reported historical pesticide usage and storage on, and likely contamination of soil at the farm complex (outside Study Area).
 - Alberta Farm, 343 Olive Avenue (APN 047-025-014) – registered historic use / storage of 200 pounds of Kocide cupric hydroxide and 120 pounds of Parathion in Stanislaus County DER files.
 - Farm of Art Filice Jr., 261 Olive Avenue (APN 047-025-048) – registered historic use or storage of 300 pounds of Parathion in Stanislaus County DER files.
 - The Agricultural Commissioner’s Office tracked pesticide applications from 2001 to 2006 on the following parcels, using inferred APNs: 047-025-005, 047-025-006, 047-025-011, 047-025-014, 047-025-019, 047-025-020, 047-025-024, 047-025-036/37, 047-025-050, 047-025-053, 047-026-026, 047-031-002, 047-031-005, 047-031-006, 047-031-008, 047-031-011, 047-031-013, 047-031-014, 047-031-015, 047-031-016, 047-031-020, 047-031-024, 047-031-028, 047-031-033/04, and 047-031-035.

9.0 OPINION AND RECOMMENDATION

The recognized environmental conditions (*de minimis*, historic, and current) detailed in the Findings Section are likely to have a negative impact upon the Study Area if they are not fully remediated before implementation of the proposed VOP Project. One potential negative impact is the interference with grading, excavation, or construction activities of unknown buried objects (e.g., USTs and associated piping). Another potential negative impact is the possible existence of contaminated soil or groundwater by petroleum hydrocarbons or pesticides. Such contamination could pose a health risk to construction personnel during ground disturbance or excavation activities. Hazards include ignition of flammable liquids or vapors, inhalation of toxic vapors in confined spaces such as trenches, the excavation of undocumented obstructions such as USTs, piping, or solid waste, or skin contact with contaminated soil or water. Residences and businesses in the Study Area and immediate vicinity currently rely upon groundwater for potable water supply, but the immediate risk to human health from potentially contaminated groundwater does not appear to be significant; supervising agencies are not believed to have issued any warnings or restricted uses in the Study Area.

It is recommended that registered ASTs and USTs (current or historic) in the Study Area be properly abandoned according to Stanislaus County DER regulations and removed before grading or other ground-breaking activities commence. Further investigation is recommended on certain properties to determine if tanks and their appurtenances exist and if any soil or groundwater contamination resulted from their use. Further investigation is recommended on certain properties to determine if drum storage and refuse disposal resulted in any soil or groundwater contamination. It is also recommended that potable water wells and agricultural wells within the Study Area be properly abandoned according to Stanislaus County DER regulations before grading or other ground-breaking activities commence. Similarly, it is recommended that septic systems within the Study Area be properly abandoned according to Stanislaus County DER regulations and septic tanks and leach fields be removed before grading or other ground-breaking activities commence. During preparatory site development activities, it is recommended that worker health and safety plans and contingency plans be prepared and implemented to address worker safety, characterization, handling, and disposal of as yet unidentified hazardous substances and petroleum products. Such materials include agricultural chemicals, petroleum products, asbestos-containing building materials, and lead and other heavy metals.

Organochlorine pesticides and metals are persistent in the environment and bioaccumulative. Both materials were historically included in agricultural chemical formulations. Based on DTSC informal policy and probable recommendation (i.e., not a requirement, but a due diligence consideration), there should be limited site-wide organochlorine pesticide and metals testing. This is in addition to focused testing at suspected sources on certain parcels, but much more limited.

Existing structures should be evaluated for asbestos containing building materials, lead-based paint, and other hazardous materials (e.g., possible PCBs, California “Universal Wastes”). Demolition wastes should be characterized, classified for disposal, handled, and disposed of accordingly.

10.0 CONCLUSIONS

A Phase I ESA has been performed in conformance with the scope and limitations of ASTM Practice E 1527 of the proposed VOP Development Study Area. Exceptions to, or deletions from, this practice are described in Section 11.0 of this report. This assessment has revealed no evidence of recognized environmental conditions in connection with the Study Area except for the following items.

- Current recognized environmental conditions – the potential for soil contamination by the Chevron Old Valley Pipeline, the likely existence of improperly abandoned ASTs and USTs and possible petroleum product contamination, the likely presence of residual pesticides and/or heavy metals, especially in pesticide handling areas of farm operations, and the possible presence of contaminants from drum storage and refuse disposal.
- Historic recognized environmental conditions – the Petroleum Recycling Corporation Superfund Site.
- *De minimis* recognized environmental conditions - the presence of refuse piles, the current registered use and storage of hazardous substances, petroleum products, and pesticides, and the existence of groundwater wells and septic systems.

As discussed in Section 9.0 of this report, further investigation into the current recognized environmental conditions identified in this assessment is recommended.

11.0 DEVIATIONS

There were no deletions or deviations from the standard practice.

12.0 REFERENCES

American Society for Testing and Materials. 2000. Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process. Designation E 1527-00. West Conshohocken, Pennsylvania. pp. 27.

Brown and Caldwell. 2002. Site Closure Work Plan for the Calvinson Property, Patterson, California.

Condor Earth Technologies, Inc. 2005. Geological and environmental hazards assessment report proposed Eastside Middle School site, 361 Walnut Avenue (APN 047-031-016 and 047-031-017) Patterson, Stanislaus County, California. Prepared for Patterson Unified School District. Prepared by Condor Earth Technologies, Inc., Stockton, California.

Department of Water Resources. 2004. Turlock Groundwater Basin Map (Turlock 5-22.03). From California's Groundwater, DWR Bulletin 118, Updated 2003. Groundwater basin contour map Internet Site, San Joaquin River Region, available at http://www.sjd.water.ca.gov/groundwater/basin_maps/maps/turl_e04/index.cfm.

13.0 QUALIFICATIONS OF ENVIRONMENTAL PROFESSIONAL

Dr. G. O. Graening is a Registered Environmental Assessor I (#08060) with the California Department of Toxic Substances Control. Dr. Graening holds a PhD in Biological Sciences and a Master of Science in Engineering. Dr. Graening has over 10 years of experience in environmental research and site assessment, including preparation of program-level Phase I ESAs, as well as environmental impact assessments for National Environmental Policy Act compliance and California Environmental Quality Act compliance. Dr. Graening has completed the 40-hour OSHA Hazardous Waste Operations and Emergency Response certification (with 8-hour annual refresher courses).

APPENDIX A

USER-Provided Information

- A-1 Title Reports
- A-2 Previous Phase I ESA (Condor Earth Technologies, Inc., 2005)

APPENDIX B

Regulatory Records Documentation

- B-1 EDR Area Study
- B-2 GeoTracker Database Query
- B-3 DTSC Envirostor Database Query
- B-4 Stanislaus County Department of Environmental Resources Case Records
- B-5 Stanislaus County Agricultural Commissioner's Office Pesticide Database Query

APPENDIX C

Historical Research Documentation

- C-1 Topographic Maps
- C-2 Aerial Photographs
- C-3 Sanborn Maps
- C-4 City Directories
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APPENDIX D

Site Photographs

APPENDIX E

Interview Documentation

- E-1 Mail and E-mail Transcripts
- E-2 Hazards/Hazardous Substances Questionnaire

**GEOLOGICAL AND ENVIRONMENTAL
HAZARDS ASSESSMENT REPORT
PROPOSED EASTSIDE MIDDLE SCHOOL SITE
361 WALNUT AVENUE
APNS 047-31-16 AND -17
PATTERSON, STANISLAUS COUNTY, CALIFORNIA**

Prepared for
**Steve Menge
Patterson Unified School District
PO Box 547
Patterson, CA 95363**

Prepared by
**Condor Earth Technologies, Inc.
188 Frank West Circle, Suite I
Stockton, California 95206
209.234.0518**

**May 24, 2005
Condor Project No. 4647**

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**GEOLOGICAL AND ENVIRONMENTAL HAZARDS ASSESSMENT REPORT
PROPOSED EASTSIDE MIDDLE SCHOOL SITE
361 WALNUT AVENUE
APNS 047-31-16 AND -17
PATTERSON, STANISLAUS COUNTY, CALIFORNIA**

EXECUTIVE SUMMARY

May 24, 2005

This is a Geological and Environmental Hazards Assessment report for the Proposed Eastside Middle School (Site) in Patterson, Stanislaus County, California (**Figure 1, Appendix A**). The Site consists of approximately 25 acres designated as Assessor's Parcel Numbers (APNs) 047-31-16 and -17 located in an area with a history of agricultural use on the north side of Walnut Avenue in Patterson, California (approximately North Latitude 37.482900 and West Longitude 121.127600). Condor Earth Technologies, Inc. (Condor) performed the assessment at the request of Mr. Steve Menge of the Patterson Unified School District (District). The District is considering the Site as the location for the proposed Eastside Middle School. The scope of work for this project is discussed in more detail in Section 1.2 of this report.

This report consists of a Phase I Environmental Site Assessment (ESA) and limited additional work not usually performed as part of a typical Phase I ESA. The limited additional work was included to assist in complying with the requirements set forth by California Education Code §17212, §17213, and §17215 and Public Resources Code §21151.8. The Phase I ESA was performed in accordance with the guidelines set forth in Practice E 1527-00, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process, published in May 1993 (Revised 2000) by the American Society for Testing and Materials (ASTM E 1527-00) and in accordance with the prevailing standard of care for completing such assessments in California at this time. The purpose of the ASTM Phase I ESA is to conduct an appropriate inquiry into previous ownership and uses of the property to help in partially satisfying the *innocent landowner defense*¹ to Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) liability and to document those conditions discovered during the inquiry that are "potential environmental conditions that could materially impact the operation of the business associated with the parcel of commercial real estate" (ASTM E 1527-00, Section 5.5). All opinions expressed herein are based upon the evidence reviewed and the assumptions made during the assessment. The additional requested service information is discussed and revealed in Sections 7.0 and 8.0.

We (Condor) have performed a Phase I ESA in conformance with the scope and limitations of ASTM Practice E 1527 of a portion of two parcels designated as APNs 047-31-16 and -17, the properties. Any exceptions to, or deletions from, this practice are noted in Section 10.0 of this report. This assessment has revealed no evidence of *recognized environmental conditions* in connection with the property except for the following:

It is Condor's opinion that the application of agricultural chemicals to the Site constitutes a *recognized environmental condition* pursuant to the ASTM E 1527-00. The Site has been used for agricultural purposes since at least the 1950s, and agricultural chemicals (including pesticides) are likely residual in the soil.

1. Terms in *italics* are defined by ASTM in Practice E 1527. See Glossary of Terms and Acronyms (Appendix I)



It is Condor's opinion that the presence of petroleum product, the petroleum product staining on the south side of the barn and the past presence of gasoline and diesel containing aboveground storage tanks (ASTs) in the farm complex (APN 047-31-17) constitute a *recognized environmental condition* pursuant to the ASTM E 1527-00. Due to the soil staining and former presence of ASTs in the farm complex, petroleum hydrocarbons contaminated soil is likely present.

It is Condor's opinion that pesticide mixing in the farm complex constitutes a *recognized environmental condition* pursuant to the ASTM E 1527-00. The Site has been used for agricultural purposes since at least the 1950s, and the odor of agricultural chemicals was noted in the farm complex area (specifically around the barn area). Pesticides are likely present in the soil.

It is Condor's opinion that the possibility of lead in the soil surrounding the perimeter of the former farm complex buildings constitutes a *recognized environmental condition* pursuant to the ASTM E 1527-00. Due to age, there is a high probability that lead-based paint was used on the buildings in the farm complex and the lead had permeated the soil around the drip line of each building.

It is Condor's opinion that there are no factors relating to the Site that could be considered *historical recognized environmental conditions*.

It is Condor's opinion that there are several *de minimis conditions* pursuant to the ASTM Standard: the domestic well, the septic system, the old battery, the possibly PCB-containing electrical transformer, and the old tires located in southwestern portion of APN 047-31-17. The tires and battery should be disposed of properly. The well should be properly abandoned and the septic system should be properly destroyed according to Stanislaus County Department of Environmental Resources (SCDER) procedures/recommendations before development begins. The use of the pipe next to the house doorway should be determined before development begins. Due to the presence of an old outhouse toilet seat observed by the northeastern corner of the barn, there is a possibility of an outhouse pit being located in that area, which should also be abandoned properly.

Additional services included the review of other information sources. Based on historical use review, file review, and the Site reconnaissance discussed and revealed in Sections 7.0, the following information was obtained regarding the Site:

- The nearest railroad tracks are 1,700 feet west of the Site.
- There are no high voltage electrical transmission lines within 350 feet of the Site.
- There are no permitted air emissions facilities within ¼ mile of the Site.
- There is no active municipal airport within two nautical miles of the Site.
- It is not a current or former hazardous waste disposal or solid waste disposal site.
- It is not a hazardous substance release site [not listed in the California Environmental Protection Agency's (CalEPA) CalSites database].
- It is not a site which contains one or more pipelines, situated underground or aboveground, which carries hazardous substances, acutely hazardous materials, or hazardous wastes under pressure.
- It is not within 500 feet of the edge of the closest traffic lane of a freeway or other busy traffic corridor as defined in the Education Code 17213 (d) (9).
- There are no facilities nor other pollution sources located within a ¼ of a mile of the Site, which might reasonably be anticipated to emit hazardous emissions, or handle hazardous or acutely hazardous materials, substances, or wastes.
- There are no rock units known to contain naturally occurring asbestos within 10 miles of the Site.



- According to a California Department of Conservation, Division of Oil, Gas, and Geothermal Resources (DOGGR) representative, no active gas or oil wells are located within ¼-mile of the Site, and the Site is not within a known oil or gas field.

Condor recommends that the District revise the school site boundary to exclude the southwestern portion of APN 047-31-17 where the former farm complex was situated.

Condor recommends that a Preliminary Environmental Assessment (PEA) be completed to evaluate pesticide concentrations in Site soil under the oversight of DTSC.

No geologic or seismic hazards were identified that are likely to impose significant constraints on the proposed Site use. In summary:

- The potential for ground surface fault rupture is considered remote,
- The potential for soil liquefaction due to seismic shaking is low,
- The danger of flooding is moderate to high,
- The potential for slope instability or landslides is considered negligible, and
- The near-surface soils have a low to moderate potential for expansion and are compressible. Mitigation of expansive soils may be limited to minor strengthening of foundations but could include chemical treatment or replacement. Implementation of a soil compaction and testing program during grading and earthwork should mitigate compressible soils.

Condor recommends the completion of a Geotechnical Engineering Study to further assess Site-specific soil, seismic, and groundwater conditions. The Geotechnical Engineering Study should be completed in accordance with Title 24 prior to design and construction of the proposed Site improvements.

LIMITATIONS TO EXECUTIVE SUMMARY

This executive summary should only be read in conjunction with the full report text. All terminology is defined in the Glossary of Terms and Acronyms in **Appendix I**. The scope of work, significant assumptions, limitations, and exceptions should be understood prior to reading the Site-specific information, findings, opinions, and conclusions.



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- Figure 3 APN Map
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- EDR™ Radius Map with GeoCheck®

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**GEOLOGICAL AND ENVIRONMENTAL HAZARDS ASSESSMENT REPORT
PROPOSED EASTSIDE MIDDLE SCHOOL SITE
361 WALNUT AVENUE
APNS 047-31-16 AND -17
PATTERSON, STANISLAUS COUNTY, CALIFORNIA**

May 24, 2005

1.0 INTRODUCTION

Patterson Unified School District (District) retained Condor Earth Technologies, Inc. (Condor) to conduct a Geological and Environmental Hazards Assessment for the proposed Eastside Middle School (Site) located in Patterson, California (approximately North Latitude 37.4829 and West Longitude 121.1276). The Site, shown on **Figures 1 through 7, Appendix A**, consists of portions of two parcels, Assessor's Parcel Numbers (APNs) 047-31-16 and -17, comprising approximately 25 acres located in an area with a history of agricultural use. The District is considering the property for the location of the proposed Eastside Middle School Site.

This Geological and Environmental Hazards Assessment has three distinct components.

1. A Phase I Environmental Site Assessment (ESA) performed in accordance with American Society for Testing and Materials (ASTM) Designation: E 1527-00, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process (ASTM E 1527-00) and is hereinafter referred to as an ASTM Phase I ESA.
2. An assessment directed to address California Education Code and Public Resources Code requirements. These activities focus on investigating for the presence of identifiable hazardous materials and the proximity of hazardous air emissions, high voltage power lines, pipelines, railroads, major roadways, and current and proposed airport runways.
3. A geological hazards assessment based on a review of available data including published literature and maps relevant to the geologic, seismic, flooding, and geotechnical setting of the Site and immediate vicinity and on a field reconnaissance of surface soil conditions.

Included is a discussion of the purpose and scope of work of each assessment; a description of the Site and adjacent properties; a discussion of information gathered from records, interviews, and Site visits; and Condor's findings and conclusions. Figures referenced in the report are included in **Appendix A**. The results of researched ASTM-recommended government databases [Environmental Data Resources (EDR™) Radius Map with GeoCheck®] are contained in **Appendix B**. Photographs of the Site are located in **Appendix C**. Pesticide Use Reporting information obtained from the Stanislaus County Agricultural Commissioner's Office is contained in **Appendix D**. Historical topographic maps and historical aerial photographs are contained in **Appendix E**. The completed Site questionnaires are located in **Appendix F**. The Air Pollution Control District's Report is contained in **Appendix G**. The results of the record searches of historic earthquake catalogs are contained in **Appendix H**. The glossary of terms associated with an ASTM Phase I ESA is contained in **Appendix I**.

1.1 PURPOSE

The purpose of the ASTM Phase I ESA is to conduct an appropriate inquiry into previous ownership and uses of the property to help in partially satisfying the *innocent landowner defense* to Comprehensive



Environmental Response, Compensation, and Liability Act (CERCLA) liability and to document those conditions discovered during the inquiry that are “potential environmental conditions that could materially impact the operation of the business associated with the parcel of commercial real estate” (ASTM E 1527-00, Section 5.5). The goal of the ASTM Phase I ESA is to identify *recognized environmental conditions* and *historical recognized environmental conditions*.

- The term *recognized environmental condition* means the presence, or likely presence, of *hazardous substances* or *petroleum products* on a *property* under conditions that indicate an existing release, a past release, or a material threat of a release of *hazardous substances* or *petroleum products* into structures on the *property* or into the ground, groundwater, or surface water of the *property*. The term is not intended to include *de minimis* conditions that generally do not present a material risk of harm to public health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. Conditions determined to be *de minimis* are not *recognized environmental conditions*.
- The term *historical recognized environmental condition* means an environmental condition that in the past would have been considered a *recognized environmental condition*, but which may or may not be considered a *recognized environmental condition* currently.

The goal of this assessment is not to demonstrate that no hazardous materials are present at the Site. The assessment is necessary, however, to complete “...all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice” [42 USC §9601 (35) (B)]. The use of an environmental professional in the performance of this assessment will minimize and manage risk of environmental difficulty, but it cannot completely eliminate the risk.

The purpose of the additional environmental hazards assessment tasks and the geological hazards assessment was to assist the District in satisfying California Education Code §17212, §17213, and §17215 and California Public Resources Code §21151.8 for the evaluation of school sites. These additional requirements are intended by the State of California to compliment the ASTM Phase I ESA requirements.

1.2 SCOPE OF WORK

1.2.1 ASTM E 1527-00 Phase I Environmental Site Assessment

The typical scope of work for an ASTM Phase I ESA is described below. The following sections summarize the scope of work that Condor performed for the ASTM Phase I ESA, California Education Code and California Public Resources Code requirements, and the geological hazards assessment. An ASTM Phase II ESA was not included in this scope of work. The results of the ASTM Phase I ESA are used to determine the need for, and scope of, a Phase II ESA or Preliminary Environmental Assessment (PEA).

1.2.1.1 Site Reconnaissance

Condor conducted a Site reconnaissance and prepared a general description of the Site. Observations were made on the Site, along the periphery of the Site, and in areas common to the Site and adjacent properties to assess if conditions suggest that hazardous substances are present on, or might migrate to, the Site. Obvious terrain characteristics of concern, such as areas of distressed vegetation, ground stains, landfills, depressions, and/or evidence of any below-grade tanks, were also noted.



1.2.1.2 Historical Information

Historical information pertaining to the Site was reviewed to learn about permits granted or citations issued (including any well and/or underground storage tank permits), prior uses of the Site and properties immediately adjacent to the Site, and local geologic and hydrogeologic data, as appropriate. Topographic maps and reasonably obtainable historical aerial photos were reviewed to assess historical land uses on and near the Site. Where available, Sanborn Fire Insurance Maps were reviewed for the Site. Historical information was obtained from topographic maps, aerial photographs, interviews, and other historical resources. Preliminary title reports were not provided by the Client.

1.2.1.3 Review of Environmental Records

The non-confidential portions of reasonably obtainable and *practically reviewable* records retained by Federal, State, and local agencies for properties in the vicinity of the Site within an approximate minimum search distance that have been investigated and/or inspected were reviewed for potential environmental liability. The records review is included in the EDR™ Report in **Appendix B**.

1.2.1.4 Evaluation and Report Preparation

A written report of the findings of the assessment was prepared upon completion of the investigation. The report includes information to support the conclusions reached by Condor that relate to the environmental condition of the Site and to the potential environmental liability, if any, imposed by the Site or by neighboring properties within the search area.

1.2.2 California Education and Public Resources Code Requirements

The following additional tasks, not part of a typical ASTM Phase I ESA, were performed to satisfy the requirements of the California Education and Public Resources Codes. The results of the following searches are located in Section 7.1 of this report.

- Facilities within ¼-mile of the Site that could emit hazardous air emissions were identified, if applicable (California Education Code §17213 and California Public Resources Code §21151.8), by contacting district-specific air pollution control regulators.
- Existing and proposed airports within two nautical miles of the Site were identified, if applicable (California Education Code §17215), by reviewing topographic maps and aeronautical charts, and by conducting a vicinity reconnaissance.
- Relative location, with respect to the Site, of high voltage power lines, high-pressure gas lines, railroad tracks, and major roadways were identified if these features were observed, by contacting county specific utility districts and by conducting a Site and vicinity reconnaissance.

1.2.3 Geological Hazards Assessment

California Education Code §17212 and §17212.5 require investigation of geological hazards for proposed public school sites. Condor performed the following tasks to identify geological hazards associated with the Site by referencing the materials listed in Section 11.0 of this report and by conducting a Site reconnaissance. The results for the hazards researched below can be found in Section 7.2 of this report.

1. Seismic and Fault Hazards



- Investigate and report whether the Site is in the Alquist-Priolo zone, situated on or near a pressure ridge, geological fault, or fault trace that may rupture during the life of the school building, and assess the student risk factor.
 - Identify the locations and potential for ground shaking of nearby faults or fault traces.
 - Perform a field inspection, Site reconnaissance, and literature review to identify possible geohazards.
2. Dam or Flood Inundation and Street Flooding
- Identify the location of the Site in relation to flood zones and dam inundation areas.
 - Determine if the Site is located within a flood zone; identify year, type, and assess potential hazards.
 - Assess potential for sheet flooding, street flooding, and dam or flood inundation.
3. Slope Stability
- Identify if the Site is located on, or near, a slope.
 - Assess potential for instability and landslides.
4. Liquefaction
- Assess the potential for liquefiable soils in the surrounding area and, if applicable, general mitigation measures.

1.3 SIGNIFICANT ASSUMPTIONS

1.3.1 ASTM E 1527-00

ASTM 3.3.27 *Practically reviewable* - Information that is *practically reviewable* means that the information is provided by the source in a manner and form that, upon examination, yields information relevant to the *property* without the need for extraordinary analysis of irrelevant data. The form of the information shall be such that the user can review the records for a limited geographic area. Records that cannot be feasibly retrieved by reference to the location of the *property* or a geographic area in which the *property* is located are not generally *practically reviewable*. Most databases of public records are *practically reviewable* if they can be obtained from the source agency by the county, city, zip code, or other geographic area of the facilities listed in the record system. Records that are sorted, filed, organized, or maintained by the source agency only chronologically are not generally *practically reviewable*. Listings in publicly available records that do not have to be located geographically are not generally *practically reviewable*. For large databases with numerous facility records (such as RCRA hazardous waste generators and registered underground storage tanks), the records are not *practically reviewable* unless they can be obtained from the source agency in the smaller geographic area of zip codes. Even when information is provided by zip code for some large databases, it is common for an unmanageable number of sites to be identified within a given zip code. In these cases, it is not necessary to review the impact of all the Sites that are likely to be listed in any given zip code; that information would not be *practically reviewable*. In other words, when so much data is generated that it cannot be feasibly reviewed for its impact on the *property*, it is not *practically reviewable*.

ASTM 3.3.29 *Publicly available* – Information that is *publicly available* means that the source of the information allows access to the information by anyone upon request.



ASTM 3.3.30 *Reasonably ascertainable* – Information that is (1) *publicly available*, (2) obtainable from its source within reasonable time and cost constraints, and (3) *practically reviewable*.

ASTM 3.3.43 *Visually and/or physically observed* – During a Site visit pursuant to ASTM Practice E 1528, or pursuant to this practice, this term means observations made by vision while walking through a *property* and the structures located on it and observations made by the sense of smell, particularly observations of noxious or foul odors. The term “walking through” is not meant to imply that disabled persons who cannot physically walk may not conduct a Site visit; they may do so by the means at their disposal for moving through the *property* and the structures located on it.

1.4 USER RELIANCE, LIMITATIONS, AND EXCEPTIONS

The scope of this project was presented in our proposal and contract number 4647 dated March 9, 2005, and subsequently approved by our Client. The scope of work for this project was limited to a qualitative evaluation of environmental concerns associated with the potential presence of hazardous materials in conjunction with current and previous activities on the Site. Condor performed this environmental assessment in accordance with the guidelines set forth in the ASTM E 1527-00. The scope of work did not include other services that are not described in this report. Specifically excluded from the scope of work are (1) the evaluation of the Site for the presence of asbestos, radon, mold, and lead-based paint, (2) a survey of the Site for wetlands or rare and endangered species, (3) a survey of the Site for historical or cultural resources, (4) permitted use of the Site, and (5) research into the title history of the Site.

Condor, as an independent contractor, has completed the ASTM Phase I ESA in accordance with the ASTM guidelines, with the customary state of the practice, and the prevailing standard of care for completing such assessments in California at this time. Condor shall not be subject to any express or implied warranties whatsoever.

This ASTM Phase I ESA is thorough, but is not intended to identify all potential concerns, or to eliminate all risk of the subject properties bearing some degree of environmental liability. Condor cannot and will not warrant or certify that the Site is free of contaminants because it is impossible to know if such a condition exists. Although risks can never be eliminated, more detailed and extensive investigations yield more information.

Land use, Site conditions (both on-site and off-site), and other factors will change over time. Site activities and regulations beyond Condor’s control could change at any time after the completion of this report. Our observations, findings, and opinions can be considered valid only as of the date of the Site visit/Site reconnaissance, April 14, 2005. This report should not be relied upon after 180 days from the date of issuance (ASTM E 1527-00, Section 4.6).

The property owner is solely responsible for notifying all governmental agencies, and the public at large, of the existence, release, treatment, or disposal of any hazardous materials observed at the Site, either before or during performance of Condor’s services. Condor assumes no responsibility or liability whatsoever for any claim, loss of property value, damage, or injury which results from pre-existing hazardous materials being encountered or present on the Site, or from the discovery of such hazardous materials.

This report and other instruments or service are prepared and made available for the sole use of the officers and representatives of Patterson Unified School District and their agents. The contents, thereof,



may not be used or relied upon by any other person(s) without the express written consent and authorization of Patterson Unified School District and Condor.

1.5 SPECIAL TERMS AND CONDITIONS

None noted.

2.0 SITE DESCRIPTION

2.1 LOCATION AND LEGAL DESCRIPTION

The Site is located approximately three-quarters of a mile northeast of downtown Patterson, California, and is shown on the Patterson, California, U.S. Geological Survey (USGS) 7.5-Minute Topographic Map, dated 1978, at approximately North Latitude 37.4829 and West Longitude 121.1276. The Site is an approximately 25-acre portion of relatively flat terrain in southeast quarter of Section 19, Township 5 South, Range 8 East, Mount Diablo Base and Meridian. The Site, designated as portions of APNs 047-31-16 and -17 (**Figure 3** in **Appendix A**), is located at 361 Walnut Avenue and shown in the Site photographs (**Appendix C**).

2.2 SITE AND VICINITY GENERAL CHARACTERISTICS

The sources used for determining the physical setting of the Site were the USGS Patterson, California 7.5-Minute Topographic Map, dated 1978, the EDR™ report (**Appendix B**), and the Federal Emergency Management Agency (FEMA) Flood Insurance Program CD for California with an on-line update. The topography map indicates the Site has a slight topographic gradient to the northeast. Walnut Avenue is located along the southern Site boundary. Salado Creek is approximately 1,000 feet north, Lateral 4 North (waterway) is approximately 1,800 feet west, Delta Mendota Canal is approximately 2.7 miles west, California Aqueduct is approximately 3.3 miles west, Lateral 3 North is approximately 2,000 feet east, and the San Joaquin River is approximately 2.6 miles northeast of the Site. Two pipelines parallel the California Aqueduct. The City of Patterson Sewage Disposal Ponds are located approximately two miles northeast of the Site. The Southern Pacific Railroad right-of-way is approximately 1,700 feet west of the Site. Patterson Airport is located approximately 2.3 miles west of the Site. State Route 33 is located approximately 1.8 miles west and Interstate Highway 5 is located approximately 3.6 miles west of the Site. The Site geologic setting is described in Section 7.2 of this report.

The average Site elevation is approximately 85 feet above mean sea level (msl). The Federal Emergency Management Agency (FEMA) map indicates that the Site is located in a 100-year flood zone (**Figure 7, Appendix A**). The area is used for agricultural purposes and one rural residence is located at the Site.

2.3 CURRENT USES OF THE PROPERTY

The current uses of the Site properties as identified by the Stanislaus County Assessor's Office Use Code, 832, indicate both properties as apricot and other tree orchards in commercial quantity with a residential living unit. The Site reconnaissance revealed the Site is used for agricultural purposes and APN 047-31-17 was planted with oats and APN 047-31-16 was planted with alfalfa.

2.4 DESCRIPTIONS OF STRUCTURES, ROADS, AND OTHER IMPROVEMENTS ON SITE

Site reconnaissance revealed Walnut Avenue is located along the southern Site boundary. Signage for underground telephone cable is located along the southern Site boundary. Overhead utility poles bearing electrical, telephone, and cable lines are also located along the southern Site boundary. An electrical



transformer is on the utility pole closest to the house: no leakage or staining was observed on the transformer or on the soil beneath. Sewer, stormwater, and water covers were observed in the pavement on the Walnut Avenue right-of-way. An asphalted driveway, a house (possibly dating from the 1930s), an old barn, an old outbuilding, an old tank house, and a well (domestic) are located in the southwestern corner of the Site. Due to the age of the buildings, there is the probability that lead-based paint and/or asbestos products were used. A metal pipe sticking up out of the ground, approximately 3½-inches in diameter and approximately 3-feet high, was located on the south side of stairway to the front door. Large plastic tarps were noted in the grassy area west of the barn; old bales of hay were noted beside the tarps. Four, large, wooden packing crates were observed stacked north of the outbuilding: they appeared to be empty. Four farm equipment attachments were observed west of the barn. Narrow berms (approximately 1.5 feet in height) trend north to south on the western and eastern boundaries of APN 047-31-16. An underground irrigation pipe is located along the northern Site boundary. A red capped spike (a corner boundary marker), located in the dirt at the corner of the properties, was observed during the Site reconnaissance. Large irrigation gates are located next to the northeastern and northwestern corners of the Site.

2.5 CURRENT USES OF THE ADJOINING PROPERTIES

Site reconnaissance revealed the northwestern, northern, northeastern, eastern, and western adjoining properties are used for agricultural purposes. A house and outbuildings are located on the southernmost eastern property (a portion of APN 047-31-16). A well and an aboveground storage tank (AST) were observed on this property. Walnut Avenue is located between the Site and the southern adjoining properties. Residences, Patterson Farm Labor Center, and an unmarked block building (corner of Hartley Street and Walnut Avenue) are located along the south side of Walnut Avenue. Salado Creek is obliterated on the northern adjoining property as observed from Olive Avenue: only an old concrete bridge appearing to sit on soil indicates the former location of the creek. Laterals D and C were observed to be dry.

3.0 -USER PROVIDED INFORMATION

3.1 TITLE RECORDS

Preliminary title reports were not provided by the Client and the Stanislaus County Recorders Office records were not reviewed.

3.2 ENVIRONMENTAL LIENS OR ACTIVITY AND USE LIMITATIONS

An environmental lien is a charge, security, or encumbrance upon title to a property to secure the payment of a cost, damage, debt, obligation, or duty arising out of response actions, cleanup, or other remediation of hazardous substances or petroleum products upon a property. No evidence of any environmental lien placed on the Site property was revealed in the course of this investigation. The Stanislaus County Recorders Office records and preliminary title reports for the Site properties were not reviewed.

3.3 SPECIALIZED KNOWLEDGE

None noted.

3.4 VALUATION REDUCTION FOR ENVIRONMENTAL ISSUES

No valuation reduction for environmental issues was revealed.



3.5 OWNER, PROPERTY MANAGER, AND OCCUPANT INFORMATION

Information obtained from Parcel Quest, an on-line service, indicates that Clarence L. Rodrick is the owner of APN 047-31-16 and DiFiore Enterprises LP, is the owner of APN 047-31-17. During the course of the investigation, it was indicated that a relative of Richard DiFiore, J. Richard Traina, is managing his affairs.

3.6 REASON FOR PERFORMING PHASE I ESA

This ASTM Phase I Environmental Site Assessment was performed to investigate the environmental conditions of the Site, which is under consideration for the location of the Proposed Eastside Middle School Site.

3.7 OTHER

None noted.

4.0 RECORDS REVIEW

4.1 STANDARD ENVIRONMENTAL RECORD SOURCES

Locations identified in the ASTM specified databases within the specified search radii are included in the EDR™ Radius Map with GeoCheck® report in **Appendix B**. The search of the databases revealed information pertaining to locations within the specified search radius. It is Condor's practice to submit the Site, whether it has been identified within the database search or not. **The Site does not appear to be a former hazardous waste disposal or solid waste disposal site and is not listed on the California Environmental Protection Agency's (CalEPA) CalSites database (not a hazardous substance release site).** The locations submitted are as follows:

- 361 Walnut Avenue (Site property)
- 513 Walnut Avenue
- 342 Olive Avenue
- 455 Eureka Street
- 455 Eureka Street
- 609 Berlin Way
- PRC Patterson [Formerly Used Defense Site(FUDS)]
- 200 First Street
- Hancor, Inc., a First Street location
- 118 Second Street
- 320 Second Street

The databases specified by ASTM are commonly subject to infrequent and partial updating. This is especially true of those locations that no longer warrant inclusion in a given database. It is, therefore, not unusual to fail to find supporting documentation for locations identified in the ASTM specified database search on file with local regulatory agencies.



4.2 ADDITIONAL ENVIRONMENTAL RECORD SOURCES

4.2.1 Stanislaus County Department of Environmental Resources

Addresses for the Site properties and selected off-site properties identified in the government databases were submitted to the Stanislaus County Department of Environmental Resources (SCDER) and the non-confidential portions of their files were researched. SCDER had records for four of the eleven locations submitted. SCDER had no files for the Site, but did have a farm file for the portion of APN 047-31-16 indicated in this report as the southeastern adjoining property.

The results of the review of documentation on file at SCDER are summarized below:

- 513 Walnut Avenue (adjoining southeastern property) is the location of an AST used for gasoline. A Hazardous Materials Farm Plan Inventory Certification form for 2003 for the owner, Clarence Rodrick, indicated that the AST is located next to the garage. No incidents have been indicated at this location, thus it does not appear to pose a risk to the Site.
- 200 First Street is the location of **Patterson Water District**, approximately 0.5 miles southwest of the Site. Two underground storage tanks (USTs) were removed in September 1986. Soil was indicated to be contaminated and was removed. A “no-further-action” letter from SCDER dated June 7, 1996, was sent to the owner regarding the tank removal. This location does not appear to pose a risk to the Site due to its “no-further-action” status.
- 118 Second Street is the location of J.E.M. Electrical and Plumbing, approximately 0.5 miles southwest of the Site. A 500 gallon UST was removed in 1987. Gasoline contaminated soil and groundwater was indicated. Soil was removed and groundwater was monitored. A “no-further-action” letter from SCDER dated October 27, 1998, was sent to the owner regarding the tank removal. This location does not appear to pose a risk to the Site due to its “no-further-action” status. It was also noted in this file that crude oil was found in the soil and groundwater indicated to be from pipelines located along the Southern Pacific Railroad right-of-way (approximately 1,700 feet west of the Site).
- 320 Second Street is the location of John’s Mini Mart, approximately 0.4 miles southwest of the Site. An Underground Storage Tank Application and Permit for gasoline, dated March 4, 2005, was noted in the file as well as Hazardous Materials Management Plans (2004 being the most recent for gasoline). In the Hydrocarbon Impacted Site Assessment Workplan dated April 12, 1999, by ASR Engineering, Inc., three USTs and dispensers were removed in 1999. It was also indicated that previous to this, two 10,000-gallon gasoline, one 5,000-gallon gasoline, one 200-gallon waste oil, and two dispenser islands were removed. Total petroleum hydrocarbons quantified as gasoline (TPH-gasoline) was indicated in the soil, 12,000 milligrams per kilograms in soil boring S-9 at 22 feet. It appears that groundwater has not been monitored. An internal document (SCDER) indicated that this location needs further investigation. Due to distance from the Site (>2,000 feet), this location does not appear to pose a risk to the Site.
- The files for the PRC Patterson (FUDS) were for a location more than one mile northwest of the Site, and were therefore not reviewed.

4.2.2 Stanislaus County Agricultural Commissioner

The names of the owner and farmer, and the location of the Site properties were submitted to the Stanislaus County Agricultural Commissioner’s Office (SCACO), and the non-confidential portions of their files were researched. Permitted materials data information is designated by geographic location and



user's name. If the user's name is not identified correctly, the permits and use reports are often unattainable. When a user has multiple crops and locations, all of the restricted materials are consolidated on a single permit.

Permitted materials data information for the years 2002 and 2003 were provided by the SCACO. It is possible that permitted materials have been applied to the Site for a longer period of time. The chemicals identified in the data information are listed below. A copy of the provided data information is located in **Appendix D**. The permittees are indicated as Larry Barletta and as Rodrick Farms. It must be noted that all of the chemicals listed may not have been applied to the two Site properties.

Table 1 – Pesticide Use Reporting

BUCTRIL 4 EC HERBICIDE	RHOMENE MCPA AMINE HERBICIDE
CROP OIL CONCENTRATE	RNA ACTIVATOR 85
DU PONT LANNATE INSECTICIDE	RNA TRI-AD 73
GRAMOXONE EXTRA HERBICIDE	SOURCE 1 NO FOAM B
LATRON AG-98	WARRIOR INSECTICIDE WITH ZEON TECHNOLOGY

4.3 HISTORICAL USE INFORMATION FOR THE SITE

Historical use information pertaining to the Site was researched using USGS topographic maps and aerial photographs obtained from EDR™. Sanborn Fire Insurance maps and city directory information were not available for the Site. Copies of the historical topographic maps and aerial photographs are included in **Appendix E**.

USGS topographic maps dated 1916, 1919, 1947, 1953, and 1971 were reviewed. The 1916 map indicates that the Site is located in a rural, agricultural area east of Patterson, California. A dwelling is located in the southwestern corner of the Site. A road is located along the southern Site boundary (Walnut Avenue). No apparent changes are indicated on the 1919 and 1947 maps. The 1953 map indicates a barn northeast of the dwelling. An orchard is indicated on the northeastern portion of the Site. The road is labeled as Walnut Avenue. The 1971 map indicates an orchard on the Site.

Aerial photographs dated 1957, 1982, 1993, and 1998 were reviewed. The 1957 photograph shows the Site as agricultural land: the eastern portion is part of an orchard. A road is located along the southern Site boundary. A driveway extends northwest from the road into a small farm complex area located in the southwestern corner of the Site that appears to contain a residence, several small buildings, and a barn. A small irrigation ditch and/or possible farm road is located adjacent to the northern Site boundary. The 1982 photograph is of poor quality. The orchard extends across the Site properties. On the 1993 photograph, the orchard was removed on the western Site property. On the 1998 photograph, the orchard was removed on the eastern Site property. Two or three small buildings appear to have been removed northwest of the house.

4.4 HISTORICAL USE INFORMATION FOR ADJOINING PROPERTIES

Historical use information pertaining to the adjoining properties was researched using USGS topographic maps and aerial photographs obtained from EDR™. Sanborn Fire Insurance maps and city directory information were not available for the adjoining properties. Copies of the historical topographic maps and aerial photographs are included in **Appendix E**.



USGS topographic maps dated 1916, 1919, 1947, 1952, 1953, 1971, and 1980 were reviewed. The 1916 map indicates that the adjoining properties are located in a rural, agricultural area east of the town of Patterson, California. A road is located between the southern Site boundary and the adjoining southern properties (Walnut Avenue). A waterway (Salado Creek) is indicated flowing from the southwest to the north-northeast on the northwestern and northern adjoining properties. A dwelling is indicated on the northwestern adjoining property. A dwelling is indicated on the southernmost eastern adjoining property and one on the western adjoining property. No changes are apparent on the 1919 map. The 1947 map indicates an orchard on the northwestern and northern adjoining properties. A barn was added on the northwestern adjoining property. The 1952 map indicates an orchard on the southernmost eastern adjoining property. Buildings and streets belonging to a Farm Labor Center are indicated on the southern adjoining properties. On the 1953 map, buildings belonging to a Farm Labor Center are indicated on the southern adjoining properties. A barn was added on the western adjoining property. On the 1971 map, residences (located north of the Farm Labor Center) are indicated on the southern adjoining properties. An orchard is indicated on the western adjoining property. The 1980 map indicates an additional building on the southernmost eastern adjoining property.

Aerial photographs dated 1957, 1982, 1993, and 1998 were reviewed. The 1957 photograph shows the Site vicinity as agricultural land. Orchards are located on the northwestern, the northern, and the southeastern adjoining properties. A road is located along the northern boundary of the northern adjoining properties. A waterway transects the northwestern and northern adjoining properties. Small farm complexes are located on the northwestern, southeastern, and western adjoining properties. A road is located between the Site and the southern adjoining properties. A large farm complex with either long poultry housing or possibly barrack-style housing and several short streets is located on the southern adjoining properties. The 1982 photograph is of poor quality. The waterway on the northwestern and northern adjoining properties appears to be removed. A possible small structure appears to be located south of the former waterway on the northwestern adjoining property and the orchard in this portion was removed. A residence is located in the northwestern corner of the northern adjoining property. The orchard located on the southeastern adjoining property was removed. An orchard is located on the western adjoining property. The map shows several of the long barrack-like buildings located on the southern adjoining properties have been replaced with wider and shorter buildings. Vegetation has been planted on the northern portion of the large, southern adjoining properties complex. The 1993 photograph shows the orchard on northern portion of the northwestern adjoining property was partially removed. An orchard was planted on the northernmost eastern properties. Residential housing is located on the southeastern, southern, and southwestern, adjoining properties. On the 1998 photograph, the remaining portion of the orchard on the northwestern adjoining property was removed. No other significant changes are apparent.

5.0 SITE RECONNAISSANCE

5.1 METHODOLOGY AND LIMITING CONDITIONS

A driving reconnaissance of the surrounding area and a walking reconnaissance of the Site were performed in accordance with the ASTM practice on April 5 and 14, 2005. The only limiting conditions to the Site reconnaissance were a crop of standing oats in the field area of APN 047-31-17 (the farmer had asked that no one should walk on it) and the tall grasses located on the west side of the barn and along the southwestern boundary of the Site.

5.2 EXTERIOR OBSERVATIONS

APN 047-31-17 is agricultural land planted in oats and APN 047-31-16 is planted in alfalfa. A narrow ditch and berm are located between the two parcels and along a portion of the eastern Site boundary. The



electricity to APN 047-31-17 was disconnected from the tank house by Turlock Irrigation District (TID) April 5, 2005, and the buildings (except for the barn) were removed from the Site by April 14, 2005. Photographs of the Site are contained in **Appendix C**.

The following items were **not** observed at the Site during the Site reconnaissance unless otherwise noted.

1. Source of potable water
A well, a tank house, and pressure tank were located in the southwestern portion of APN 047-31-17.
2. Sewage disposal
A septic system was indicated by the owner on APN 047-31-17.
3. Hazardous substances and petroleum products in connection with identified uses.
A disconnected natural gas pipe and valve were observed on the south side of the house.
4. Storage tanks
5. Odors
Chemical smells were noted on the west side of the barn (entrance area) and approximately ten feet from the southeastern corner of the barn. A slight petroleum smell was noted on the south side of the barn where petroleum product staining was observed.
6. Pools of liquid
7. Drums
8. Hazardous substances and petroleum products containers
A five-gallon bucket of gear oil was observed in the barn.
9. Polychlorinated biphenyls (PCBs)
A transformer on a utility pole is located along the southern Site boundary, south of the house. No leakage on the transformer or staining on the soil beneath it were noted.
10. Unidentified substance containers
A five-gallon plastic bucket containing a small amount of viscous liquid was observed on the south side of the barn.
11. Stained soil or pavement
Soil, stained by petroleum products, was observed on the south side of the barn. A salt-like residual was observed on the soil and on the concrete flooring inside the barn.
12. Pits, ponds, or lagoons
13. Stressed vegetation
14. Solid waste
Four old tires were observed on the south side of the barn and one old tire was located within the barn. Some household trash on the ground and in two 5-gallon buckets was observed on the east side of the outbuilding. A large construction dumpster was located in the driveway, east of the house and the outbuilding. An old battery was observed by the northeastern corner of the barn. An old outhouse toilet seat was also observed by the northeastern corner of the barn.
15. Waste water
16. Wells
A domestic well was located on the north side of the old tank house.
17. Debris



5.3 INTERIOR OBSERVATIONS

Observations within the interior of the house indicate gas appliances [furnace, stove, and water heater (still in place)], had been in use. Two vents protruded from the roof. There was a narrow crawl space accessed from outside of the house on the northern side.

6.0 INTERVIEWS

Site questionnaires were provided to Clarence L. and Gladys S. Rodrick, owners of APN 047-31-16; to Richard DiFiore (DiFiore Enterprises, LP), owner of APN 047-31-17; to J. Richard Traina, contact for DiFiore Enterprises; and to Larry Barletta (via Mr. Traina), farmer on APN 047-31-17. The completed Site questionnaires are included in **Appendix F**.

6.1 INTERVIEW WITH OWNER

Mrs. Rodrick indicated “No” to all the questions asked on the Transaction Screen Questionnaire. She indicated they have owned the property since 1963; currently has alfalfa planted; have sprayed for weevils; and any prunings were shredded on the property. The surrounding adjoining properties are used for agriculture (alfalfa and oats). She was interviewed during the Site reconnaissance and indicated that most of the surrounding properties had been apricot orchards (approximately 16 years ago), including APN 047-31-16. Irrigation water is provided by Patterson Irrigation District. Her house property is not included in the Site. There is an AST (located on the adjoining southernmost eastern property) that was used for gasoline and diesel in the past, but is not currently in use.

Mr. DiFiore indicated on the Transaction Screen Questionnaire that there have been industrial drums or sacks of chemicals located on the property and it is unknown whether there is any stained soil on the property. He indicated he has owned the property for approximately 40 years; the property is currently used for agriculture; “beulate” and “diazione” have been used on the property; row crops are located on the northern adjoining property; alfalfa is grown on the eastern adjoining property, and apricots are grown on the western adjoining property; Larry Barletta leases the land for agricultural purposes (grain); a well, a septic system, and buildings (approximately 60 years old) were located on the property; and aboveground storage tanks have been on the property. Mr. DiFiore was interviewed via telephone, April 14, 2005. He indicated he thought the septic tank is located on the west side of the house. He purchased the property sometime in the 1950s. He was unsure of the pipe located next to the front door of the house and indicated there may be a possibility it is associated with the tank house. There used to be a tank for water in the old tank house.

6.2 INTERVIEW WITH SITE MANAGER

Larry Barletta, renter/grower on APN 047-31-17, indicated “No” to all the questions asked on the Transaction Screen Questionnaire except for one; it was unknown to him if there is any stained soil on the property (APN 047-31-17). He indicated he has been using the property as a grower for approximately five years. He has grown corn and grains. The adjoining properties to the north, east, and west are used for row crops, alfalfa, and apricots. He has used pesticides/agricultural chemicals on the property for weed control. There were buildings, irrigation piping, and a well on the property. There has been an aboveground storage tank on the property.

Mrs. Barletta was interviewed on April 4, 2005, and Mr. Barletta was interviewed on April 5, 2005, via telephone. They indicated oats are currently growing on the property and should be harvested soon. They have been farming the property about five years. There are irrigation standpipes along the northern Site



boundary and the property is watered from the north. The well on the property was used for the house (domestic); there is no irrigation well on the property. There used to be a stationary fuel AST on the property. There are a few agricultural attachments located by the barn used on the crops. Patterson Irrigation District provides water for irrigation of the crops through their canals.

Mr. Traina, cousin of and Site manager for Mr. DiFiore, was interviewed on March 29 and on April 6, 2005. He indicated the red capped spike in the northeastern corner of the Site is probably a boundary marker that an adjoining property owner spray-painted after he had his property surveyed. There used to be two ASTs, gasoline and diesel, outside the southwest corner of the barn. Mr. Traina did not know what the pipe located on the south side of the house doorway was for.

6.3 INTERVIEW WITH OCCUPANTS

Not applicable.

6.4 INTERVIEW WITH LOCAL GOVERNMENT OFFICIALS

Mike Willett, Deputy Director of the City of Patterson Public Works Department was contacted on April 6, 2005, regarding underground piping near the Site and water and sewage service for the Site properties. It was indicated that there is a main underground sewer line in the Walnut Avenue right-of-way: the pipeline is under less than 60 pounds per square inch of pressure. The building located on the southwestern corner of Hartley and Walnut Avenues belongs to the City of Patterson (City). Mr. Willett was not aware of what the building currently contains or if the inside of it is currently used. He did indicate that a telephone pedestal for the area is located on this property and that the building had formerly been used to add chemicals to the sewer pipeline before the sewage arrived at the sewage treatment ponds located on the east end of Walnut Avenue (over two miles northeast of the Site). The Site properties are not currently serviced by the City for either water or sewage, as they are not located within the City limits. One of the boundaries for the City is currently indicated as being between the west and east sides of First Street and between the south and north sides of Walnut Avenue. The residences located on the south side of Walnut Avenue are on public water and sewer, and garbage disposal is contracted through the City with Waste Management. Telephone services in the area are provided by Global Valley Networks, natural gas is provided by PG&E, and electricity is provided by Turlock Irrigation District (TID).

West Stanislaus Fire Department was contacted regarding possible responses to the Site properties. They have records readily available only since 2002. They researched those records and indicated there were no hazardous materials incidents on file for the Site.

7.0 ADDITIONAL SERVICES

7.1 CALIFORNIA EDUCATION AND PUBLIC RESOURCES CODE REQUIREMENTS

7.1.1 Railroad Tracks, Major Roadways, High Voltage Power Lines, and Gas Lines/Wells within Site Vicinity

Based on review of topographic maps, aerial photos, and the Site reconnaissance, there are no railroad tracks or major roadways within 1,500 feet of the Site. Union Pacific Railroad right-of-way is located approximately 1,700 feet west of the Site: underground pipelines parallel the railroad tracks. Highway 33, a rural roadway, is located approximately 1,800 feet west of the Site. According to the published 2003 California Department of Transportation statistics, the portion of Highway 33 located near Las Palmas Avenue has an annual average daily traffic flow of 7,100 vehicles per day.



Pacific Gas & Electric (PG&E) was contacted regarding underground natural gas lines. PG&E indicated there are only distribution pressure (less than 60 psi) underground gas lines within 1,500 feet of the Site. Turlock Irrigation District (TID) was contacted regarding overhead electrical power lines located on the north side of Walnut Avenue. TID indicated the overhead power lines are at distribution voltage, which is 12,000 volts (12 kV).

A representative of the California Department of Conservation, Division of Oil, Gas, and Geothermal Resources (DOGGR) was contacted to ascertain if any gas or oil wells are located in the vicinity of the Site. According to a DOGGR representative, no active gas or oil wells are located within ¼-mile of the Site and the Site is not within a known oil or gas field. No indications of underground pipelines were noted within 1,500 feet of the Site on the topographic maps or observed during the Site reconnaissance.

The City of Patterson Public Works Department was contacted regarding underground piping near the Site. It was indicated that there is a main underground sewer line in the Walnut Avenue right-of-way; the pipeline is under less than 60 psi.

7.1.2 Hazardous Air Emissions within ¼ Mile of the Site

Condor requested the San Joaquin Valley Air Pollution Control District (SJVAPCD) review their records to identify facilities within ¼-mile of the Site that may produce hazardous air emissions. The area encompassed in the search is shown in **Figure 4, Appendix A**. SJVAPCD had no records on file for locations within ¼-mile of the Site (**Appendix G**).

7.1.3 State Fire Marshal Pipeline Safety Program within One Mile of the Site

The Office of State Fire Marshal, Pipeline Safety Program (OSFM) was contacted regarding pipelines in the vicinity of the Site. OSFM identified one entity, Kinder-Morgan Energy Partners (Kinder Morgan), under their jurisdiction with pipelines within one mile of the Site. According to OSFM's information, the pipelines are identified as CSFM ID 0299; size 12; and commodity as refined products (gasoline, jet fuel, gas oil). Kinder Morgan was contacted regarding this information. They indicated their pipelines are "beyond 1500 feet" of the Site.

7.1.4 Existing and Proposed Airports within Two Nautical Miles (2.3 Statute Miles) of the Site

Based on review of topographic maps, aerial photographs, and Site reconnaissance, there is no airport within two nautical miles of the Site (**Figure 4, Appendix A**). The historical use review of the 1953 and 1971 topographic maps (**Appendix E**) show Patterson Airport (2.32 statute miles), a small existing airport, is located over 2.3 miles southwest of the Site. Site reconnaissance revealed a small airport facility, two small hangars, and four small buildings.

7.2 GEOLOGICAL HAZARDS ASSESSMENT

A geological hazard investigation was performed per the California Education Code §17212 requirements. The purpose of the investigation was to examine the Site for potential geologic hazards that could limit the intended use of the land or have significant impacts on development costs. The following tasks were completed for this investigation:

- Performed a geologic reconnaissance to examine bedrock outcrops and soil exposures within the Site.



- Reviewed maps, reports, and other published documents relevant to the geology, seismic setting, and geotechnical conditions of the Site and its surrounding area.
- Prepared the geologic hazards section of this report which specifically addresses the following:
 - Anticipated subsurface conditions
 - Seismic and fault hazards including liquefaction potential
 - Presence of compressible or expansive soils
 - Potential for flooding
 - Stability of slopes
 - Mitigation of any identified potential geologic hazards

7.2.1 Geologic and Seismic Setting

The Site is located in the Great Valley Geomorphic Province (Great Valley), which is bound to the west by the Coast Range Province and to the east by the Sierra Nevada Province. The Great Valley is a northwest-trending, structural depression, filled with up to six vertical miles of lithified marine and non-marine sediments, and unlithified non-marine sediments. Regionally, the lithology of the upper 3,000 feet of sediments is indicative of uplift of the Sierra Nevada Mountains to the east and, to a lesser degree, the Coast Range Mountains to the west.

The Coast Range Mountains generally consist of northwest trending ridges with Franciscan Assemblage and granitic basement rocks. The Sierra Nevada Province is an asymmetric range, with a steep fault-bounded eastern front and gentle western slope that dips under the sediments of the Great Valley to the west. The bedrock complex of the Sierra Nevada Mountains generally consists of metamorphosed, sedimentary, and volcanic rocks of Paleozoic and Mesozoic age (150 to 300 million years old), and plutonic rocks (chiefly granitic types) of Mesozoic age (80 to 150 million years old).

Structurally, the Coast Ranges – Sierra Nevada Block Boundary Zone, a regional geological boundary separating Franciscan basement rocks of the Coast Range from granitic basement rocks of the Sierra Nevada Range, is present at depth near the western margin of the Great Valley.

The northern portion of the Great Valley is termed the Sacramento Valley and the southern portion is termed the San Joaquin Valley. The Site is located in the northwestern portion of the San Joaquin Valley at an elevation of approximately 85 feet above mean sea level (msl). Near-surface sedimentary deposits underlying the Site consist of coalescing alluvial fan deposits derived primarily from rocks of the Coast Range Mountains. The Department of Soils and Plant Nutrition, University of California, Davis and the County of Stanislaus, California, mapped the soil type at the Site as part of the Myers Series, which is very deep, well drained soil formed in alluvium from sedimentary rock sources; specifically Myers clay with zero to two percent slopes. The distribution of surface deposits in the vicinity of the Site is shown on **Figure 5, Appendix A. There are no documented occurrences of rocks known to contain naturally occurring asbestos within 10 miles of the Site.**

7.2.2 Fault Hazards

The Site is located in a moderately seismic region of California's Central Valley. The Site lies within Seismic Zone 3 as defined in section 1629A.4.1 of the 2001 California Building Code (CBC). Seismic Zone 4 is approximately 3.6 miles to the west. The locations of significant faults relative to the school Site are shown on **Figure 6, Appendix A.**



A records search of historic earthquake catalogs (EQSearch, CISN/TriNet and NCEDC) was performed to identify earthquakes that have occurred in the vicinity of the Site. The search included earthquakes of magnitude 5.0 (M5.0) or greater occurring within 161 km (100 miles) of the Site since 1800. The results of these searches are presented in **Appendix H**. These records indicate that 121 earthquakes of estimated magnitude M5.0 or greater and 22 earthquakes of M6.0 or greater have occurred within 161 km of the proposed school Site. Of these historic earthquakes, the 1866 M5.8 earthquake located about 15.3 km (9.5 miles) from the Site, likely caused the strongest shaking with an estimated Peak Ground Acceleration (PGA) of about 0.17g when modeled as a blind thrust fault.

According to the segmentation model developed by the Working Group on Northern California Earthquake Potential (1996), the Great Valley Thrust Fault Zone (GVTFZ), a system of northwest trending concealed (“blind”) thrust faults, is mapped 5 km (3 miles) west of the Site at an estimated depth of 7 km beneath the east foothills of the Coast Range and the fault plane dips at about 15 degrees toward the west. The trace of the vertical projection of the GVTFZ is shown on **Figure 6**. Since rupture of the GVTFZ faults does not usually extend to the ground surface, this fault system has only recently been recognized as a potential source of earthquakes. The GVTFZ was responsible for the M6.7 Coalinga earthquake of 1983 and is considered the probable source of the twin Vacaville-Winters earthquakes of 1892 of similar magnitude, as well as perhaps five other historic earthquakes of M6 or greater. In addition to the GVTFZ, a number of major active strike-slip faults belonging to the San Andreas Fault system trend northwest through the San Francisco Bay Area approximately 60 km (37 miles) west of the Site.

No known active or potentially active faults cross the proposed school Site, and the Site is not located in a Fault-Rupture Hazard Zone as established by the Alquist-Priolo Earthquake Fault Zoning Act (Hart, 1997). Therefore, ground rupture from faulting is not considered a significant hazard. Nevertheless, the Site is near a number of major active faults capable of generating strong earthquakes. Active and potentially active faults considered capable of causing strong ground motion at the Site are listed in the following table along with both their respective distances to the Site and their respective estimated maximum earthquake magnitudes, M_w max. The locations of these faults relative to the proposed school Site are shown on **Figure 6, Appendix A**.



TABLE 1 - REGIONAL SIGNIFICANT FAULTS

Fault	Distance to Site (km)	Maximum Earthquake - M_w max (Moment Magnitude)
Great Valley Thrust Fault Zone (Segment 7)	5.5	6.7
Great Valley Thrust Fault Zone (Segment 3)	7.6	6.6
Ortigalita	27	7.1
Greenville	34	6.6
Calaveras (Central)	53	6.2
Calaveras (Northern)	60	6.8
Hayward (Southern)	61	6.7
Foothills Fault System	65	6.5
San Andreas (Sta. Cruz Mtns.)	77	7.0
Mt. Diablo	80	6.6
San Andreas (Peninsula)	85	7.1
Concord	95	6.2

The GVTfZ is the active fault nearest the Site and likely dominates the local seismic hazard. The GVTfZ is classified as a “Type B” seismic source by the 2001 CBC criteria (Table 16A-U; ICBO, 2002) based on its potential to generate a maximum earthquake of M_w 6.7 and its estimated long-term slip rate of 1.5 mm/year (Petersen et al., 1996; Cao, et al, 2003). The top of the Great Valley Thrust Fault rupture surface is estimated to lie at a depth of 7 km with the rupture surface descending westward at a dip of 15 degrees (Working Group, 1996).

7.2.3 Liquefaction Subsidence Potential

Liquefaction is a phenomenon whereby loose, cohesionless, saturated, sandy soils lose shear strength during the cyclic loading accompanying an earthquake. The consequences of liquefaction of the soils underlying a site can include: bearing capacity failure of structure foundations; lateral spreading of the liquefied deposits and overlying soils; and localized settlement of the ground surface.

Water well records of a well west of the Site from an on-line State of California Department of Water Resources source indicate that the depth-to-water from 1958 to 1978 ranged from 52 feet to 61 feet below ground surface. Liquefaction potential at the Site is considered low because groundwater is expected at a depth greater than 50 feet. Condor recommends the completion of a Geotechnical Engineering Study to confirm Site-specific soil, groundwater, and liquefaction potential.

7.2.4 Dam or Flood Inundation and Street Flooding

Based on the TerraServer 1991 USGS topographic map, Salado Creek is located approximately 1,000 feet north and the San Joaquin River is located approximately 2.6 miles northeast of the Site. The Site is within the 100-year flood zone of the Federal Emergency Management Agency (FEMA) insurance map dated May 1996 (**Figure 7, Appendix A**). The Site is within Zone AO, where the 100-year flood depth is one foot deep or less. Based on the FEMA map, the Site has a moderate to high risk from flooding during the life of the project. Aerial photos indicate Salado Creek is not present above ground surface north of the Site. Site reconnaissance revealed no evidence of a creek or ditch present at the intersection of Salado



Creek and Olive Avenue, only an old bridge is present. Potential impact to the Site from the San Joaquin River flooding is considered small.

The California Aqueduct Canal and Delta Mendota Canal are located at an elevation of about 200 feet approximately 2.6 miles west of the Site. The potential risk of flooding posed by failure of one or both of these canals is also considered small.

The Site natural soil, Myers clay, is permeable according to the Westside Stanislaus Soil Survey, 1968. No evidence of recent local flooding or sheet wash was observed at the Site during our field investigation. Drainage control on local streets should be maintained in accordance with Stanislaus County or the City of Patterson drainage standards as applicable.

7.2.5 Slope Stability

The Site is located on a series of laterally coalescing alluvial fans known as a bajada that emanate from the Coast Range Mountains. The portion of the alluvial fan near the Site is relatively stable and the risk from slope failure of the alluvial sediments is minimal. The angle of repose of most earth materials is about 30 to 35 percent; therefore, naturally occurring slopes inclined 30 percent or more (≥ 17 degrees) may be considered susceptible to slope failure. The nearest slopes inclined at about 33 percent (18 degrees) are located approximately 4.8 km (3 miles) to the southwest. Sedimentary bedrock likely occurs at a shallow depth beneath the surface on these slopes. No evidence of landslides, debris flows, rock falls or blow out areas were observed during our field investigation. Considering the distance between areas of potential slope failure and the Site, the potential impact from landslides, debris flows, or rock fall is considered small.

7.2.6 Expansive and Compressible Soils

The Westside Stanislaus Soil Survey, 1968, indicates that the Site consists of clay loams underlain by thick layers of calcareous loams or clay loams with a potential for expansion. Field observations indicated that the surface soils are lean clay with a low to moderate potential for expansion. Mitigation of expansive soils may be limited to minor strengthening of foundations, but could include chemical treatment or replacement. The non-engineered natural soils are compressible. Implementation of a soil compaction and testing program during grading and earthwork should mitigate compressible soils.

8.0 FINDINGS

The Site consists of properties historically used for agricultural purposes since at least the 1950s. The Site consists of an approximately 25-acre portion of two parcels, APNs 047-31-16 and -17, located on the north side of Walnut Avenue, Patterson, California. USGS topographic maps of the area illustrate a general topographic gradient to the northeast. According to observations made during the Site reconnaissance, residences and agricultural land are located on adjoining properties. Site questionnaires and reconnaissance, and interviews indicated APN 047-31-17 had a well for water and septic systems for sewage and that the Site is not within the City Limits.

The review of ASTM-specified databases revealed several locations within the specified radii. Condor reviewed files provided by SCDER for four of the eleven submitted addresses. John's Mini Mart, located at 320 Second Street, is approximately 0.4 miles southwest of the Site. USTs and dispensers were removed from this location and TPH-gasoline was indicated in the soil. As of January 2004, it appears that the groundwater has not been monitored. An internal document (SCDER) indicated that this location



needs further investigation. Due to distance from the Site (>2,000 feet), this location does not appear to pose a risk to the Site.

Site reconnaissance revealed there were an old tank house, a well (located on the north side of the tank house), a house, an outbuilding (possibly used as a dwelling), and a barn located in the southwestern portion of the Site (farm complex) on APN 047-31-17. Historical information appears to indicate that some other small buildings were also located in this farm complex. Due to the age of the buildings, there is the probability that lead-based paint and/or asbestos products were used. A septic system was indicated on the west side of the house by the owner. Chemical odors were noted on the west side of the barn (entrance area) and approximately ten feet from the southeastern corner of the barn. A slight petroleum odor was noted on the south side of the barn where petroleum product staining was observed. A salt-like residual was observed on the soil and on the concrete flooring inside the barn. A five-gallon bucket of gear oil was observed in the barn. A transformer on a utility pole is located along the southern Site boundary, south of the house. No leakage on the transformer or staining on the soil beneath it were noted. A five-gallon plastic bucket containing a small amount of heavy liquid was observed on the south side of the barn. Four old tires were observed on the south side of the barn and one old tire was located within the barn. Some household trash on the ground and in two 5-gallon buckets was observed on the east side of the outbuilding. An old battery and an old outhouse toilet seat were observed by the northeastern corner of the barn.

Additional services included the review of other information sources. Based on historical use review, file review, and the Site reconnaissance discussed and revealed in Sections 7.0, the following information was obtained regarding the Site:

- The nearest railroad tracks are 1,700 feet west of the Site.
- There are no high voltage electrical transmission lines within 350 feet of the Site.
- There are no permitted air emissions facilities within ¼ mile of the Site.
- There is no active municipal airport within two nautical miles of the Site.
- It is not a current or former hazardous waste disposal or solid waste disposal site.
- It is not a hazardous substance release site (not listed in the CalEPA CalSites database).
- It is not a site which contains one or more pipelines, situated underground or aboveground, which carries hazardous substances, acutely hazardous materials, or hazardous wastes under pressure.
- It is not within 500 feet of the edge of the closest traffic lane of a freeway or other busy traffic corridor as defined in the Education Code 17213 (d) (9).
- There are no facilities nor other pollution sources located within a ¼ of a mile of the Site, which might reasonably be anticipated to emit hazardous emissions, or handle hazardous or acutely hazardous materials, substances, or wastes.
- There are no rock units known to contain naturally occurring asbestos within 10 miles of the Site.
- According to a DOGGR representative, no active gas or oil wells are located within ¼-mile of the Site, and the Site is not within a known oil or gas field.

Opinions and conclusions regarding the geologic hazard portion of the report (Section 7.2) are included in Section 9.0, below.

9.0 OPINION AND CONCLUSIONS

We (Condor) have performed a Phase I ESA in conformance with the scope and limitations of ASTM Practice E 1527 of a portion of two parcels designated as APNs 047-31-16 and -17, the properties. Any exceptions to, or deletions from, this practice are noted in Section 10.0 of this report. This assessment has



revealed no evidence of *recognized environmental conditions* in connection with the property except for the following:

It is Condor's opinion that the application of agricultural chemicals to the Site constitutes a *recognized environmental condition* pursuant to the ASTM E 1527-00. The Site has been used for agricultural purposes since at least the 1950s, and agricultural chemicals (including pesticides) are likely residual in the soil.

It is Condor's opinion that the presence of petroleum product, the petroleum product staining on the south side of the barn and the past presence of gasoline and diesel containing ASTs in the farm complex (APN 047-31-17) constitute a *recognized environmental condition* pursuant to the ASTM E 1527-00. Due to the soil staining and former presence of ASTs in the farm complex, petroleum hydrocarbons contaminated soil is likely present.

It is Condor's opinion that pesticide mixing in the farm complex constitutes a *recognized environmental condition* pursuant to the ASTM E 1527-00. The Site has been used for agricultural purposes since at least the 1950s, and the odor of agricultural chemicals was noted in the farm complex area (specifically around the barn area). Pesticides are likely present in the soil.

It is Condor's opinion that the possibility of lead in the soil surrounding the perimeter of the former farm complex buildings constitutes a *recognized environmental condition* pursuant to the ASTM E 1527-00. Due to age, there is a high probability that lead-based paint was used on the buildings in the farm complex and the lead had permeated the soil around the drip line of each building.

It is Condor's opinion that there are no factors relating to the Site that could be considered *historical recognized environmental conditions*.

It is Condor's opinion that there are several *de minimis conditions* pursuant to the ASTM Standard: the domestic well, the septic system, the old battery, the possibly PCB-containing electrical transformer, and the old tires located in southwestern portion of APN 047-31-17. The tires and battery should be disposed of properly. The well should be properly abandoned and the septic system should be properly destroyed according to SCDER procedures/recommendations before development begins. The use of the pipe next to the house doorway should be determined before development begins. Due to the presence of an old outhouse toilet seat observed by the northeastern corner of the barn, there is a possibility of an outhouse pit being located in that area, which should also be abandoned properly.

Condor recommends that the District revise the school site boundary to exclude the southwestern portion of APN 047-31-17 where the former farm complex was situated.

Condor recommends that a Preliminary Environmental Assessment (PEA) be completed to evaluate pesticide concentrations in Site soil under the oversight of DTSC.

No geologic or seismic hazards were identified that are likely to impose significant constraints on the proposed Site use. In summary:

- The potential for ground surface fault rupture is considered remote,
- The potential for soil liquefaction due to seismic shaking is low,
- The danger of flooding is moderate to high,



- The potential for slope instability or landslides is considered negligible, and
- The near-surface soils have a low to moderate potential for expansion and are compressible. Mitigation of expansive soils may be limited to minor strengthening of foundations but could include chemical treatment or replacement. Implementation of a soil compaction and testing program during grading and earthwork should mitigate compressible soils.

Condor recommends the completion of a Geotechnical Engineering Study to further assess Site-specific soil, seismic, and groundwater conditions. The Geotechnical Engineering Study should be completed in accordance with Title 24 prior to design and construction of the proposed Site improvements.

All opinions expressed herein are based upon the evidence reviewed and the assumptions made during the assessment. The additional requested service information is discussed and revealed in Sections 7.0 and 8.0.

10.0 DEVIATIONS

This ASTM Phase I ESA was performed by Condor according to the scope and limitations of ASTM Practice E 1527-00, except that preliminary title reports were not provided by the Client and the Stanislaus County Records Office records were not reviewed.

11.0 REFERENCES

SITE AND VICINITY GENERAL CHARACTERISTICS

1. Site reconnaissance
2. Patterson, California, U.S. Geological Survey 7.5-Minute Topographic Quadrangle Map dated 1971.

CURRENT USES OF THE ADJOINING PROPERTIES

3. Site reconnaissance

HISTORICAL USE INFORMATION ON SITE AND ADJOINING PROPERTIES

4. Historical USGS topographic maps dated 1916, 1953 and 1971 for the Patterson, CA; dated 1919, and 1947 for the Orestimba, CA; and dated 1952, 1971, and 1980 for the Crows Landing, CA quadrangles obtained from EDR™.
5. Aerial photographs dated 1957, 1982, 1993, and 1998 obtained from EDR™.

GENERAL SITE SETTING

6. Patterson, California, U.S. Geological Survey 7.5-Minute Topographic Quadrangle Map dated 1971.
7. EDR™ Radius Map with GeoCheck® dated March 22, 2005.
8. Federal Emergency Management Agency (FEMA) Flood Map Compact Disc dated May 1996 and on-line update, 2001.

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10. Traffic Counts: <http://www.dot.ca.gov/hq/traffops/saferesr/trafdata/index.htm>.

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12. California Building Code, 2001, California building Standards Commission, and International Conference of Building Officials, 2002.
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18. Patterson, California, U.S. Geological Survey 7.5-Minute Topographic Quadrangle Map dated 1971.
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21. (http://www.conservation.ca.gov/CGS/rghm/psha/fault_parameters/pdf/2002_CA_Hazard_Maps.pdf).
22. Site reconnaissance.
23. State of California Department of Water Resources, http://wdl.water.ca.gov/gw/gw_data/hyd/Rpt_Hist_Data5_gw.asp
24. State of California Department of Water Resources, Lines of Equal Elevation of Water in Wells, Unconfined Aquifer (<http://well.water.ca.gov>).
25. TerraServer, Patterson, CA USGS 7.5-Minute Topographic Quadrangle Map dated 1991, <http://terraserver.homeadvisor.msn.com/>
26. Tri Net, Earthquake Information System (<http://www.trinet.org/trinet.htm>).
27. Wagner, D.L., E.J. Bortugno, and R.D. McJunkin, Geologic Map of the San Francisco-San Jose Quadrangle, California, 1:250,000, 1991.
28. Working Group on Northern California Earthquake Potential, 1996, Database of Potential Sources for Earthquakes Larger than Magnitude 6 in Northern California, U.S. Geological Survey Open-File Report 96-705, 40 pp.

RECORDS REVIEW

29. EDR™ Radius Map with GeoCheck® dated March 22, 2005.

REPORT STANDARDS

30. ASTM E 1527-00.



12.0 QUALIFICATIONS OF ENVIRONMENTAL PROFESSIONALS

Condor has several decades of aggregate experience in the performance of Phase I ESAs and environmental audits for financial institutions, attorneys, private companies and public agencies. Experienced environmental professionals perform assessments and audits that provide a standard of care consistent with industry practice and employ guidelines developed by the ASTM.

Patsy Gonzalez performed the Site investigation under the direct supervision of Mr. Alexander Dewitt, a California Professional Geologist, and Mr. Jeff Willett, a California Professional Engineer and Registered Environmental Assessor. Mr. Willett has 20 years of postgraduate environmental experience, including six years of employment by the U.S.-EPA and the California Regional Water Quality Control Board-San Francisco Bay Region. Specific certificates of registration and additional qualifications and references for the above mentioned individuals and others that worked on the project are available on request.

13.0 QUALIFICATIONS OF GEOTECHNICAL PROFESSIONALS

Condor has over 15 years of experience in the performance of Geotechnical Engineering Studies and Geohazard Reports for private companies, developers, and public agencies. Experienced geotechnical professionals perform field exploration and historical document research, and make engineering recommendations that provide a standard of care consistent with industry practice that employ guidelines developed by the ASTM, UBC, and Title 24.

Marc R. Crum, a California Registered Geologist and Certified Engineering Geologist, performed the geohazard assessment. Mr. Crum has over 15 years of environmental and geotechnical experience.

14.0 SIGNATURES

Respectfully submitted,

CONDOR EARTH TECHNOLOGIES, INC.



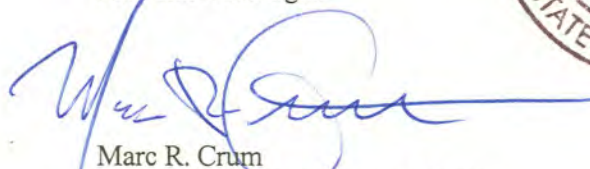
Patsy Gonzalez
Environmental Specialist



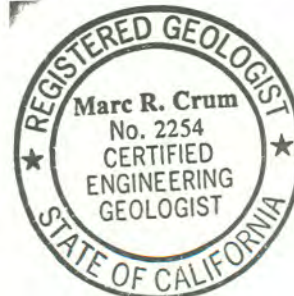
Alex Dewitt, P.G. #7502
Associate Geologist



Jeff Willett, P.E., R.E.A.
Engineering Services Manager



Marc R. Crum
CA Professional Geologist # 6848
CA Certified Engineering Geologist # 2254



APPENDIX E: WATER SUPPLY ASSESSMENT

City of Patterson



Water Supply Assessment

For

The Villages of Patterson

Final

July 2006

Prepared by:

**The H2O Group
Rescue, CA
(916) 686-1598**

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- B. DWR Delta-Mendota Sub Basin Description Bulletin 118
- C. California Groundwater Management Status
- D. City of Patterson General Plan
- E. Excerpt from “City of Patterson - Development Impact Fee Justification Study, 2005”, and associated Resolution 2006-19

Abbreviations and Acronyms

AF or af	Acre Feet
AFY or afy	Acre Feet per Year
BOR	US Bureau of Reclamation
CA	California Aqueduct
CEQA	California Environmental Quality Act
COP	City of Patterson
CUWCC	California Urban Water Conservation Council
CVP	Central Valley Project
DHS	State of California, Department of Health Services
DMC	Delta Mendota Canal
DMM	Demand Measurement Measures
DWR	State of California, Department of Water Resources
ET _o	Evapotranspiration
GMP	Groundwater Management Plan
gpcd	gallons per capita per day
GPM or gpm	Gallons per Minute
gpm/ft	gallons per minute per foot (units of transmissivity)
MG	Million Gallons
MGD	Million Gallons per Day
M&I	Municipal and Industrial
mg/l	Milligrams per liter
NWS	National Weather Service
ppb	Parts per billion (identical to ug/l)
ppm	Parts per million (identical to mg/l)
RWQCB	Regional Water Quality Control Board
SWP	State Water Project
SWRCB	State Water Resources Control Board
TDS	Total Dissolved Solids
ug/l	Micrograms per liter
USBR	United States Bureau of Reclamation
USEPA	United States Environmental Protection Agency
UWMP	Urban Water Management Plan
WPS	City of Patterson 2006 Water Planning Study
WTP	Water Treatment Plant
WTSF	Water Treatment and Storage Facility

INTRODUCTION

Background

The Villages of Patterson (“Villages”) is a proposed development located within the City of Patterson’s existing general plan area, just northeast of the City Center. The proposed project consists of approximately 670 acres of single and multi-family residential housing, commercial/office areas, and public use areas. As proposed, Villages will include approximately 3,100 new residential units.

A water supply study and master plan was prepared by GDR Engineering, Inc. in July 2005 for the project. The plan identifies facilities necessary to convey and distribute water for the project, in accordance with the City of Patterson’s 2001 Water Master Plan. Water infrastructure will include minor and major pipelines and up to two (2) new groundwater pumping facilities.

Water supply for the project will be provided by the City of Patterson. The City of Patterson is the water purveyor for the community, with approximately 5,500 service connections.¹ Water is provided through the use of wells located within the City boundaries. The City has been providing retail water service for the community for over 50 years.

According to California Water Code section 10910, any city or county that determines that a new development project is subject to the California Environmental Quality Act (CEQA) may need to prepare a Water Supply Assessment (WSA) if it has more than 500 residential dwelling units. Because there is not an approved Urban Water Management Plan that accounts for water demands associated with the proposed project, a WSA must be provided as part of the CEQA documentation.

Purpose

The purpose of this WSA is to provide important water supply information associated with the proposed project in accordance with Senate Bill 610 (Chapter 643, Statutes of 2001). The act is meant to improve the link between information on water supply availability and certain land use decisions made by cities and counties. SB 610 seeks to promote more collaborative planning between local water purveyors and agencies making planning decisions. SB 610 requires that detailed information regarding water availability to be provided to planning decision-makers prior to approval of specified

¹ Per City of Patterson 2005 Annual Report to the Drinking Water Program, DHS, State of California.

large development projects, and that information be included in the administrative record that serves as the evidentiary basis for an approval action by the planning agency. SB 610 requires that WSA's be furnished to local governments for inclusion in any environmental documentation.

ASSESSMENT

There are specific requirements for information associated with SB 610 that must be addressed in the WSA. For clarity, this WSA will follow the recommended outline as provided by the California Department of Water Resources (DWR).

Section 1 - CEQA Compliance and SB 610 (Water Code § 10910(a))

The City has determined that CEQA applies to the Villages project and has required that an environmental impact report be prepared. Water Code §10910(a). The total number of residential dwelling units may be up to 3,100 units thus exceeding the 500 unit threshold that requires a WSA. Water Code §10912(a)(1).

Section 2 - Preparation of the WSA (Water Code § 10910(b))

If there is a “public water system” for the project, that water supplier shall prepare the WSA. Water Code §§ 10910(b), (g)(1). A public water system is defined as a system that has 3,000 or more service connections and provides piped water to the public for public consumption. Water Code §10912(c). Under this definition, the City of Patterson is a public water system as it provides piped water to the public for consumption and has approximately 6,000 service connections, more than the 3,000 threshold. Consequently, the City shall prepare the WSA.

Section 3 - Prior Water Supply Assessments (Water Code § 10910(h))

Under SB 610, a determination must be made whether the proposed project already has been the subject of an assessment. Water Code §10910(h). No prior WSA that includes the proposed development was prepared.

Section 4 - Urban Water Management Plan (Water Code § 10910(c))

Under SB 610, information from an adopted Urban Water Management Plan can be used for a WSA if the projected water demand for the project was accounted for in the most recent UWMP. Water Code §10910(c). The City of Patterson prepared and adopted an UWMP in 2002 that included the water demands associated with the project. However, the plan was found to be incomplete by DWR. While it is unclear what the status is of an UWMP that has been adopted by a city under Water Code §10642 but found incomplete

by DWR (see Water Code §10644), the City will not rely on its 2002 UWMP for this WSA. Since an updated UWMP (2005) will be complete and submitted to DWR later in 2006, there is no UWMP available to the city that has been adopted and found complete by DWR. Consequently, the City will prepare a separate and independent WSA for the proposed project that does not rely on an UWMP. This WSA was prepared by the H2O Group on behalf of the City of Patterson.

Section 5 – Content of the WSA (Water Code § 10910(c)(d))

According to SB 610, the water supplier must prepare an assessment that includes a discussion of whether the total projected water supplies determined to be available for the project during normal, single dry, and multiple dry water years during a 20-year projection will meet the projected water demand associated with the proposed project, in addition to the water supplier's existing and planned future uses, including agricultural and manufacturing uses.

Supplies from all sources, including wholesaler supplies, require documentation. This documentation includes identifying and quantifying water rights, contracts, and/or entitlements to the supply; associated capital outlay programs; federal, state and local permits for constructing infrastructure for conveying the supply; and any necessary regulatory approvals required for conveyance.

The City of Patterson has made significant progress in its water supply planning efforts, which are described herein. Specifically, the City authorized the development of a Water Planning Study ("WPS")² in late 2005, to evaluate water demands, sources of supply available to the City, and alternatives for treatment of these sources. The WPS is significantly more comprehensive than this WSA or an UWMP. It analyzes various options available for source water and numerous options for treatment of those sources. The purpose of the WPS was to identify the best overall program to supply drinking water to the City of Patterson.

Part of the WPS included aquifer testing to solidify assumptions of groundwater yield made in a 2002 groundwater study conducted by the City.³ This WSA utilizes some of the information collected and developed as part of that study. Pertinent sections of the WPS have been included in the appendix.

It is important to distinguish between the alternatives presented in the WPS and information developed in this WSA. Alternatives developed in the WPS include options that allow the City of Patterson to optimize their water supply program. Thus, the WPS investigated programs that use ground and surface waters in various combinations. One of the alternatives includes the sole use of groundwater to supply the water demands of

² The H2O Group, 2006, *City of Patterson, Water Supply Planning Study*.

³ Kenneth Schmidt & Associates, 2002, *Groundwater Supply Evaluation for City of Patterson*.

the City's build-out population (2020), consistent with their current water supply program and the program defined in this WSA. Until and unless City officials adopt a new water supply alternative, groundwater will remain the sole source of supply. This WSA assumes that only groundwater remains available to the City.

A. Documenting Supplies

Presently, the City of Patterson uses groundwater to meet all of its municipal and industrial water demands. There is a significant quantity of local groundwater⁴ available for use by the City of Patterson. However, salinity concentrations in the groundwater may force the City to provide treatment at some time in the future.⁵ Total dissolved salts are under the acceptable limit,⁶ but could rise as additional groundwater is used. Groundwater quality is dynamic, and it is not uncommon to see changes over time due to local pumping activities. In response, the WPS identified options for treatment of groundwater, should it become necessary. Treatment options for groundwater presented in the WPS are shown in Appendix A.

Over the next three (3) years, the City expects an average growth rate of 3%,⁷ resulting in the addition of approximately 165 new connections per year. However, for planning purposes a more conservative number of 250 will be used for this WSA. This will increase total system demands from 3,250 acre-feet to 3,800 acre-feet during that period.⁸

The City has not seen measurable changes in the groundwater table or yield due to periods of low precipitation.⁹ Studies of the local groundwater supply have not indicated that precipitation will have an adverse impact on groundwater levels, yields, or quality.¹⁰ Mitigation for potential quality impacts due to long-term groundwater use are addressed in the WPS, which include treatment of a portion of the groundwater for salts (TDS).

⁴ Kenneth Schmidt & Associates, 2002, Groundwater Supply Evaluation for City of Patterson, and Kenneth Schmidt & Associates, letter dated April 4, 2006, describing sustainable yield of 11,500 ac-ft/year for use by City of Patterson.

⁵ Stoddard & Associates, 2001, *Water Supply Options, City of Patterson*, pages 2-4.

⁶ City of Patterson, Title 22 Well Testing Program per DHS requirements.

⁷ According to City Planning, an increase of approximately 13,500 persons by 2020, or 45% increase over the next 15 years. Actual year-to-year growth rates could vary significantly.

⁸ WPS water projections include a 1.15 safety factor multiplier for a more conservative estimate of future water demands (See Table 5-4).

⁹ The City checks groundwater levels routinely in its regular operations.

¹⁰ Kenneth Schmidt & Associates, 2002, *Groundwater Supply Evaluation for City of Patterson*, and Kenneth Schmidt & Associates, letter dated April 4, 2006, for use by City of Patterson.

The City is an “appropriative” user of groundwater in that it in effect exports the water for public use to parcels of real property other than those from which the water is. As an appropriative user, the City’s groundwater rights are defined by the amount of water taken and put to beneficial use. Although the City has a right to pump this water, the City has no tangible evidence of these rights such as entitlements, water rights, or water service contracts. Under California law, unless a groundwater basin has been adjudicated, no written document normally will exist of groundwater rights. Because rights in the sub-basin from which the City draws water have not been adjudicated, no judicial decree exists to identify groundwater rights in the basin.

Accordingly, the City, like numerous other Central Valley cities that rely solely on groundwater, can provide no documents of water supply entitlements, water rights, water service contracts, written contracts, other proof of entitlements, court decision, order, or decree or other documentation in this WSA (although the city has rights as an appropriative user of groundwater.) Rather, the information specifically required of WSA’s under Water Code §10910(f) when the water supply includes groundwater is provided below.

The following tables provide information related to source supplies and use, both actual and projected.

Table 1: Annual Source Supply Summary

Supply	AFY	Entitlement	Right	Contract	Ever Used
Groundwater	11,500 + ¹¹	NA	NA	NA	Yes

Table 2: Normal Year Water Deliveries (Actual and Projected)¹²

Water Supply Source	1990	1995	2000	2005	2010	2015	2020	2025	2030
Groundwater	1,660	1,973	2,360	3,250	4,704	5,712	6,720	7,616	8,176

The City has policies in place regarding the capital outlay program necessary for funding delivery of the groundwater supply. Under the City’s General Plan, new growth must

¹¹ Kenneth Schmidt & Associates, 2002, *Groundwater Supply Evaluation for City of Patterson*, and Kenneth Schmidt & Associates, letter dated April 4, 2006, for use by City of Patterson.

¹² Past water supply use: 1990-2000 from Stoddard and Associates, “City of Patterson, Water Supply Assessment” 2002 (West Patterson Business Park/Patterson Gardens), and 2005 from the H2O Group, “City of Patterson, Water Planning Study”, 2006.

pay to develop new groundwater supplies it requires. Goal IV.A of the General Plan declares a city goal “(t)o maintain an adequate level of service in the City’s water system to meet the needs of existing and future development.”¹³ Policy IV.A.8 under this goal ensures that new development pays for necessary water supplies. This policy states that “The City shall, through a combination of water development fees and other funding mechanisms, ensure that new development pays its share of the costs of water system improvements.”¹⁴

The City implements these policies through a development impact fee program that provides the funding necessary for the City to construct water supply facilities. The City thus secures the resources necessary for funding/capital outlay from this program. An impact fee study was performed by the City in 2005, and new fee schedule adopted in March, 2006, as recommended by the study.¹⁵ Excerpts from the fee justification study associated with water infrastructure adopting these developer fees that comprise the funding/capital outlay for the City’s water program are attached as Appendix E, as well as the resolution adopting said fees by the City Council.

The federal, state, and local permits necessary to construct the necessary infrastructure associated with delivering a groundwater supply to the City and the necessary regulatory approvals required to convey/deliver the groundwater to the City system are the following:

1. Well Drilling Permit - Construction of a water supply well outside of the City limits would require a permit from the Stanislaus County Environmental Health Department;
2. Encroachment Permit – Construction of water pipes and conveyance facilities outside of the City limits would require an encroachment permit from Stanislaus County Public Works Department;
3. Amendment to the City’s Domestic Water Supply Permit – An amendment to the City’s existing Domestic Water Supply Permit (per the California Health and Safety Code) is necessary for a community water system to construct and operate a new water supply source, including water wells, or a major expansion of the system’s service area.

Should treatment of the groundwater become necessary to meet water quality standards, the federal, state, and local permits necessary to construct the necessary infrastructure associated with treatment of the groundwater and the necessary regulatory approvals

¹³ City of Patterson General Plan, Page II-23.

¹⁴ City of Patterson General Plan, Page II-23.

¹⁵ Crawford Multari & Clark, “City of Patterson, Development Impact Fee Justification Study, 2005/06”

required for treatment of the groundwater to convey/deliver it to the city water system are the following:

1. Amendment to the City's Domestic Water Supply Permit – An amendment to the City's existing Domestic Water Supply Permit (per the California Health and Safety Code) is necessary for a community water system to construct and operate a water treatment system.

A.1 Groundwater Documentation

The City of Patterson is located on the west side of Stanislaus County, near Interstate 5, approximately 30 miles south of the City of Tracy, just west of the San Joaquin River. It is within the San Joaquin River Hydrologic Region, as defined by the California Department of Water Resources (DWR). According to DWR,¹⁶ the region is heavily groundwater reliant, with groundwater accounting for about 30 percent of the annual supply used for agricultural and urban purposes in the region. The aquifers are generally quite thick in the San Joaquin Valley subbasins, with groundwater wells commonly extending to depths of up to 800 feet. Aquifers include unconsolidated alluvium and consolidated rocks with unconfined and confined groundwater conditions. Typical well yields in the San Joaquin Valley range from 300 to 2,000 gpm with yields of 5,000 gpm possible.¹⁷

The City is located within the Delta-Mendota Subbasin, as defined by DWR.¹⁸ The geologic units that comprise the ground water reservoir in the Delta-Mendota subbasin consist of the Tulare Formation, terrace deposits, alluvium, and flood-basin deposits. The Tulare Formation is composed of beds, lenses, and tongues of clay, sand, and gravel that have been alternately deposited in oxidizing and reducing environments. The Corcoran Clay Member of the formation underlies the basin at depths ranging about 100 to 500 feet and acts as a confining bed.

Groundwater in the Delta-Mendota subbasin occurs in separate water-bearing zones. These include the lower zone, which contains confined fresh water in the lower section of the Tulare Formation, an upper zone which contains confined, semi-confined, and unconfined water in the upper section of the Tulare Formation.

Groundwater flow was historically northwestward parallel to the San Joaquin River. Recent data (DWR 2000) show flow to the north and eastward, toward the San Joaquin River. Based on current and historical groundwater elevation maps, groundwater barriers do not appear to exist in the subbasin. An analysis of historical changes in groundwater

¹⁶ State of California, DWR, Bulletin 118, Update 2003, page 169.

¹⁷ State of California, DWR Bulletin 118, Update 2003.

¹⁸ State of California, DWR, Bulletin 188, Update 2003, page 169.

levels for the subbasin are based on annual water level measurements by DWR and other cooperators.

DWR has projected that the San Joaquin River Hydrologic Region (of which the sub-basin is a part) is in balance and not in an overdraft condition. FN DWR Bulletin 160, Volume 3, Chapter 7, p. 7-5 and table 7-2 at p. 7.7. In Bulletin 118, DWR indicates that “(a)n overage, the subbasin water level has increased by 2.2 feet from 1970 through 2000.” FN DWR Bulletin 118, California’s Groundwater, “San Joaquin Groundwater Basin, Delta-Mendota Subbasin,” last update 01/10/06. According to DWR the basin is not adjudicated, and the city is not aware of any adjudication of the basin.¹⁹

Appendix B includes the full text of DWR’s most recent report for the Delta-Mendota subbasin, updated January, 2006.

San Luis Delta-Mendota Water Authority Groundwater Management Plan and Pumping Analysis

In 1995, the agencies that comprise the San Luis Delta-Mendota Water Authority (SLDMWA) entered into an agreement to jointly fund the preparation of a coordinated regional groundwater management plan (GMP). According to the Central Valley Project Improvement Act (1992) federal water contractors are required to prepare a GMP in accordance with AB 3030 for water conservation purposes. The study included a thorough analysis of the Delta-Mendota Sub-Basin, which includes the City of Patterson.²⁰ This is the only groundwater management plan or other specific authorization for groundwater management for the basin that includes aquifers used by the City of Patterson. However, since the City is not a participant in the plan, the plan does not directly affect the City’s use of the basin

Due to the size of the Delta-Medota Sub-Basin and changes in basin characteristics along its length, the study divided the basin into three areas for analysis; north, central, and south. The City of Patterson is located in the north basin. According to the GMP, the study consisted of: 1) a detailed hydrologic analysis to estimate the changes in groundwater storage from 1986 through 1994, 2) estimate of sustainable yield, 3) estimate the total basin-wide groundwater pumping during the 1986 – 1994 period, and 4) determine any potential impacts of DMC export on the overall water resources balance.

The study used two separate approaches to determine the impacts of groundwater pumping in the sub-basin, including: 1) the *Specific Yield Method*, and 2) the *Water Balance Method*. Each are commonly used methods for analysis and projecting groundwater use and impacts.

¹⁹ DWR, 2004, *Status of Groundwater Management in California*, see Appendix B.

²⁰ Stoddard & Associates, “Groundwater Management Plan for the Northern Agencies in the Delta-Mendota Canal Service Area and a Portion of San Joaquin County”, 1995.

In summary, the Specific Yield Method uses changes in piezometric head in confined and unconfined aquifers and hydrologic theory to estimate changes in basin storage. Groundwater tables respond in accordance to accepted laws and principals when basin storage is increased or decreased (as when groundwater is pumped from the basin).

The Water Balance Method consists of a general accounting of inflows and outflows of basin water. The analysis consists of quantifying water that flows into the basin (through surface recharge from applied water or precipitation, canal leakage, and subsurface inflow), or out of the basin (from crop use, pumping, or subsurface outflow).

According to the study, the northern section of the Delta-Mendota Sub-Basin in “a hydrologically balanced condition”.²¹ Changes in storage capacity did not change significantly during the 8-year study period. Variations in water levels were attributed to reductions in surface water supplies during drought years and changes in precipitation. Under normal conditions, the study projected an increase in storage of 35,000 acre-feet annually, and that that amount of additional pumping could occur without impacting the basin’s present water storage.²²

An important finding of the study is that subsurface outflow (from groundwater basin to the San Joaquin River) varied from 73,000 acre-feet per year to 185,000 acre-feet per year. In other words, water leaves the sub-basin because the water table is higher in elevation than the river. This is likely due to an artificially raised groundwater table resulting from applied surface water from federal and state water projects. Typically, when groundwater basins are in decline, adjacent rivers would add to, or flow into the basin. This is not the case in the northern Delta-Mendota Sub-Basin. Significant volumes of water continuously flow out of the basin into the San Joaquin River. This suggests that even more than the 35,000 acre-feet annual increase in pumping could occur without causing a “overdraft” condition. By pumping more than 35,000 acre-feet annually, the basin water table would be stable, but marginally lower than its current elevation, thereby further reducing the outflow. Thus, according to the study, additional pumping of approximately 85,000 acre-feet annually could occur without lowering the water table below natural conditions.

Based on the SLDMWA study, it is clear that the City of Patterson’s anticipated increase in pumping of approximately 6,000 acre-feet annually (from 2,000 acre-feet/year²³ to 8,200 acre-feet/year) will be far below the safe yield of the groundwater available in the Delta-Mendota Sub-Basin.

²¹ Stoddard & Associates, “Groundwater Management Plan for the Northern Agencies in the Delta-Mendota Canal Service Area and a Portion of San Joaquin County”, 1995, page 24.

²² Stoddard & Associates, “Delta-Mendota Canal Groundwater Pumping Analysis”, pages 51, 52.

²³ 1995 groundwater use per City of Patterson utility records.

City of Patterson Groundwater Studies (2002 – 2006)

Since existing reports of regional basins and subbasins do not go to the detail necessary for the City to determine a sustainable safe yield value for local groundwater, the City performed its own groundwater evaluation studies. According to these studies and City records, water levels and well capacity do not appear to have changed in the area. Although the City continues to add wells for additional supplies, the local groundwater table appears to have remained stable.

In 2002, a groundwater study was authorized by the City to review the yield and storage capacity of the local groundwater basin underlying the City.²⁴ The study concluded that there are essentially two aquifers underlying the City; a lower confined zone, and an upper unconfined zone. The two aquifers are separated by the thick, semi-impermeable Corcoran Clay layer.

In general, groundwater flow was in a northeast direction, with a down-gradient slope of four to eight feet per mile. The study estimated that the transmissivity of the aquifers was approximately 100,000 gpd/ft, resulting in about 9,100 acre-feet of annual recharge into the two aquifers, with additional unquantified recharge from canal seepage, percolation of irrigation water, and streamflow seepage.

Due to the importance of understanding the sustainability of groundwater for future planning, a subsequent 6 day aquifer test was conducted during the week of February 21, 2006, by the City of Patterson. In summary, the new testing efforts resulted in the following conclusions:

1. The lower aquifer (below Corcoran Clay) transmissivity is 80,000 gpd/ft, with a storage coefficient of 0.0003 (as opposed to 100,000 gpd/ft and 0.001 respectively from 2002 report);
2. No significant downward leakage was found between the upper and lower aquifers (through the Corcoran Clay);
3. Groundwater flow is in a northwesterly direction, as opposed to a northeasterly direction as previously suspected;
4. Total sustainable production from the lower aquifer alone is approximately 8,000 ac-ft/year (an increase from 5,600 ac-ft as indicated in the 2002 study). Total sustainable yield is approximately 11,500 acre-feet/year including the upper aquifer.

The importance of this new information is that there appears to be more sustainable groundwater in the lower aquifer than indicated in past studies, and the recharge (gradient) is from a southeast direction which could be more beneficial for recharge and water quality. Should the City stay within these sustainable limits, overdraft should not occur and this no long-term overdraft condition is at issue. In addition, minimal leakage between the upper and lower aquifers allows the City to pump more water without

²⁴ “Groundwater Supply Evaluation for City of Patterson”, Kenneth Schmidt and Associates, 2002.

impacting private, shallow wells, and water in the lower aquifer is less susceptible to surface contaminants (i.e. pesticides, nitrates, etc.).

A.2 Historical Groundwater Use

Areas around the City are primarily irrigated farmland, and rely on state and federal water projects, or the San Joaquin River for the greater portion of their water needs. Since the City does not have rights to use surface water from the San Joaquin River, it has relied on groundwater for its water supply for over 50 years. It owns and operates public water wells to supply water for municipal and industrial demands.

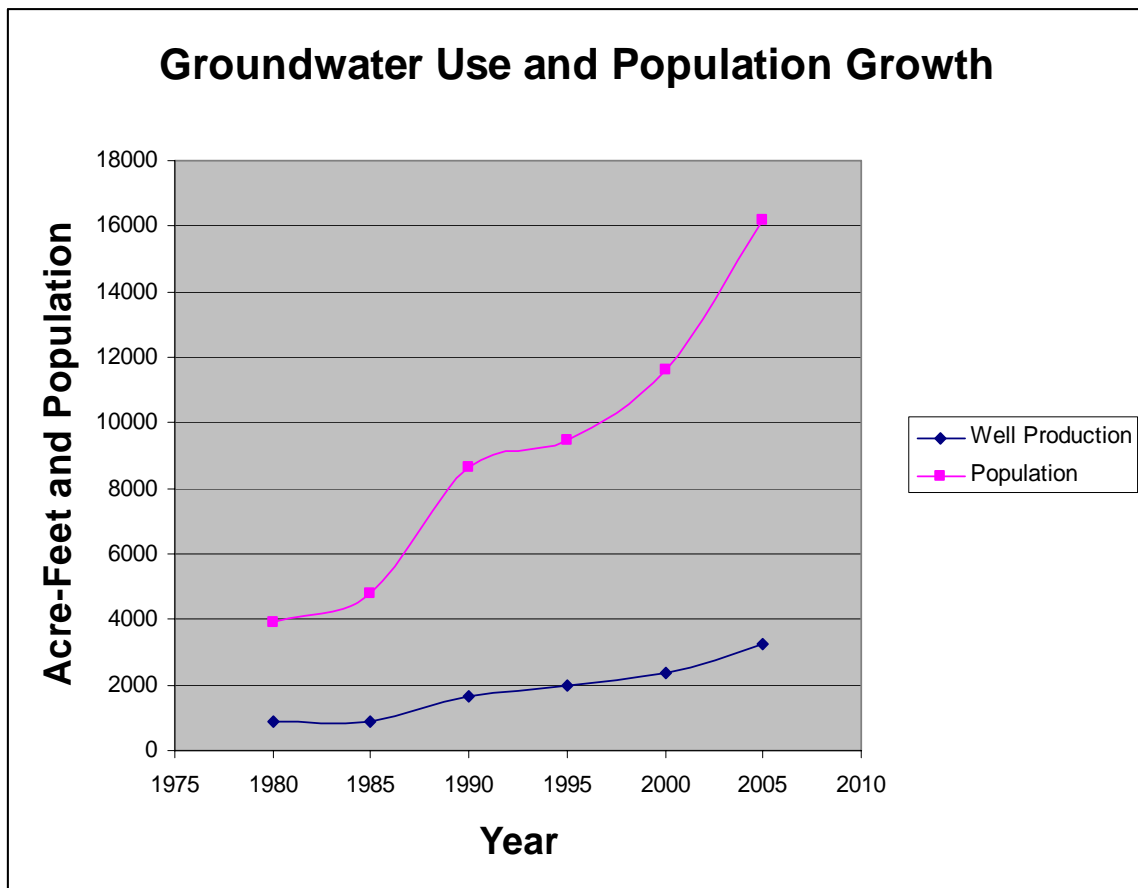


Figure 1: Relationship between groundwater use and population growth²⁵

Groundwater production has increased as the City population has grown, but not in proportion to the population, as shown in the Figure 1. From 1980 to 2005, groundwater

²⁵ City of Patterson Well Pumping and Population records, per the Public Works and Community Planning.

production increased at a slower rate than population.²⁶ This is likely due to “background” demands associated with system loss, construction water, industrial use, etc. The amount of groundwater pumped by the City in the past five (5) years is shown in Table 3.

Table 3 – City of Patterson Total Water Demand 2001 - 2005²⁷

	2001	2002	2003	2004	2005
Total Water Demand (Ac-Ft)	2,840	2,950	3,020	2,910	3,250

Presently, the City has 6 operational wells with production ranging from 600 gpm to 1,600 gpm, and a total production of approximately 6,700 gpm.²⁸ All production wells are located within the City’s Sphere of Influence (See Appendix D). A detailed description of the City well facilities are shown in Table 4.

Table 4: Summary of City of Patterson Groundwater Wells²⁹

Well	Type	Year	Depth	Screens	Flow (gpm)
2	Production	1947	360'	170'- 356'	700
4	Production	1971	433'	204'- 433'	800
5	Production	1986	565'	390'- 565'	1,600
6	Production	1994	365'	225'-255' 345'-355'	600
7	Production	1999	597'	342'- 597'	1,500
8	Production	2004	470'	340'- 390' 444'-460'	1,500
9	Monitoring	2001	440'	350'- 435'	NA
10	Monitoring	2001	550'	310'- 530'	NA
11	Monitoring	2001	540'	360'- 390' 520'- 540'	NA

Note: Well No. 1 was destroyed in 1998; Well No. 3 was placed in “inactive” status by the City in 1998 due to excessive sand production.

²⁶ City of Patterson, 2000 Urban Water Management Plan.

²⁷ City of Patterson Public Works Department annual pumping records.

²⁸ City of Patterson, Public Works Department. Operations Data.

²⁹ City of Patterson Department of Public Works well records.

To serve cumulative demand, the City will continue to rely on its untreated groundwater until contaminants reach or exceed drinking water standards. At that time, the City will either treat the groundwater for said contaminants, or acquire and use an alternative water source. If groundwater is used, some of the City's existing wells may be maintained and new wells would be constructed to draw water from the confined aquifer. Wells will be located to optimize the quality of groundwater pumped, and also minimize potential adverse effects of mutual interference of pumping, as discussed below.

Impacts to the groundwater table are expected to be minimal. When wells draw water from an aquifer, the result is a decline in the local water table surrounding the well. The pattern or shape of declining water resembles a cone, thus is often referred to a "cone of depression". The shape of the cone is a function of aquifer characteristics, like transmissivity, anisotropy, depth, etc. This drawdown effect is normal, and an expected result of pumping. The cone will also grow in depth and radius with time as the well pump continues to draw water from the well. When wells are constructed in the same vicinity, there is potential that the cone developed by each well can overlap, causing a condition known as "mutual interference". When mutual interference occurs, the efficiency of each well is diminished, and will typically reduce total well production of both wells. Of course, adding additional wells can exacerbate this condition. Thus, it is important that the construction and spacing of multiple wells be carefully analyzed to ensure the most efficient system and long-term operating cost.

An impact of pumping water from a groundwater basin that is in excess of the basin's recharge (total water entering the basin through natural or artificial means) is commonly referred to as "overdraft". In an overdraft condition, water is essentially mined from the basin, creating a large depressed area in the groundwater table. Typically, this condition will induce greater recharge to the area of depression due to steepened gradients, and the basin will attempt to stabilize. In the event stabilization does occur, and additional rates of water are not drawn from the basin, the higher yield becomes sustainable. However, adverse impacts of this condition include causing other (shallower) wells to become dry, ground subsidence, and potentially drawing in less desirable water (contaminants).

Regarding the City of Patterson, yields from local aquifers are not expected to exceed recharge, thus no overdraft condition should occur. There will be local cones of depression due to normal well operation, and these may fluctuate seasonally, but basin wide impacts that occur during conditions of severe groundwater overdraft are not anticipated as long as yield does not exceed recharge.

Since the City will draw primarily from the confined zone, impacts to private wells should be minimal. In order to minimize construction costs, most private domestic wells are constructed to draw water from the shallow aquifer. Currently there are over 200 parcels located outside Patterson City limits, many that use private wells for domestic and irrigation. The City of Patterson General Plan prohibits the use of private wells within City limits. Thus, when new developments annex to the City they will be required to

abandon their private wells and connect to the City's water supply system. Although the City may use minor quantities of water from the shallow aquifer, it will be in similar magnitude to shallow aquifer water currently pumped by private wells.

A.3 Groundwater Treatment

The City is considering several treatment methods to remove dissolved solids from groundwater.³⁰ It should be noted that not all of the groundwater would require treatment, and the process will likely consist of some blend of treated and untreated groundwater. The actual proportions depend on final water goals determined by the City (i.e. TDS goal of 300 mg/l vs 500 mg/l), changes in groundwater quality, and introduction of future surface water supplies. However, it is expected that approximately 50% of the groundwater would receive treatment.

The treatment methods considered included reverse osmosis (RO) membrane treatment, ion-exchange, lime softening, electro dialysis/electro dialysis reversal (ED/EDR), and distillation. These are summarized in Appendix A, and based on the WPS. The draft WPS concludes that based on the size of the treatment facility the City would need, ED/EDR and distillation would not be cost effective and these methods were not analyzed. The WPS also recommends use of membrane treatment (RO) over other feasible options.

Brine produced by the TDS treatment would need to be processed. The WPS identifies options for brine handling and disposal. These include 1) a secondary process consisting of nanofiltration (NF) to reduce the volume of concentrate, 2) solar evaporation ponds, 3) salt marsh wildlife habitat, and 4) blending with existing wastewater. Additional analysis will be conducted by the City to determine the best option for brine disposal.

Although the costs of treatment would be high, the WPS concluded that groundwater treatment remains a feasible alternative, and may be less expensive than a conjunctive use program of surface and groundwater. More precise cost estimates must await more detailed engineering evaluation and identification of the particular treatment technology and brine disposal method to be used.

B. Projected Demands

The City of Patterson supplies potable groundwater for residential, industrial, and commercial uses through a combination of groundwater wells, storage tanks, and network of piping. Each water service is equipped with a water meter for accounting and billing. The City is responsible to operate and maintain the water system up to the water meter. Water meters for residential services range from 5/8" to 1" in diameter. Commercial

³⁰ The H2O Group, "City of Patterson, Water Planning Study," 2006.

services are typically 1” or greater, depending on the type of use. The largest connection is 6” in diameter.

Municipal and industrial water use includes metered and unmetered connections, although very few connections are not metered. All new connections made to the City’s water system will be metered. The City does not separately track different types of water use sectors (e.g. residential, commercial, industrial, landscaping, etc.), so future demands are estimated based on per capita use, similar to analysis conducted by DWR in past water supply studies (Bulletin 160). These values account for commercial, industrial, City landscaping (e.g. parks), construction water, unaccounted for losses, etc.

The amount of water used by a property owner is a function of several factors. These include the price of water, income, demographics, conservation measures, and climate. Since a large portion of water goes to outside use to irrigate landscaping, communities located in warmer areas typically consume more water during the year. Although price is a deterrent, it does not always result in sustained reductions in water use.

There are three main water use values that must be considered when planning and designing water supply programs. These include annual demand, maximum day demand, and peak hour demand, as described below:

Annual Demand – The total amount of water a community uses during the year. This value determines the water needed from source supplies, such as groundwater and/or surface water. Communities must plan to secure long-term water availability based on annual demand projections.

Maximum Day Demand – The highest amount of water used in one 24-hour period. This value determines the capacity of water treatment facilities. Although this condition may only occur a few days each year, communities should plan to size treatment facilities (and storage) to meet maximum day conditions assuming an unscheduled maintenance event removes a portion of the treatment capacity from service.

Peak Hour Demand – The highest amount of water the system will move at any given moment. This value determines the storage and pipe (distribution) capacity of the system.³¹ This condition is assumed to last for approximately 4 hours during a maximum day demand.

Water use in the State of California varies depending on the location, as expected. Those areas where the climate is warmer and have less rainfall use more water than colder, wetter locations. For example, households in the Bay Area and San Diego use less water than those in Sacramento and Bakersfield. Due to the local climate (hot and dry), it would be expected that the City would have higher demands that are similar to other communities in the Central Valley. However, pumping records indicate that the City’s

³¹ Emergency flow conditions (e.g. fire demands) are also taken into account when designing these facilities.

household use is much lower than the statewide average of 244 gallons per capita per day (gpcd).³² Figure 2 illustrates the City's per capita use from 1998 through 2004.

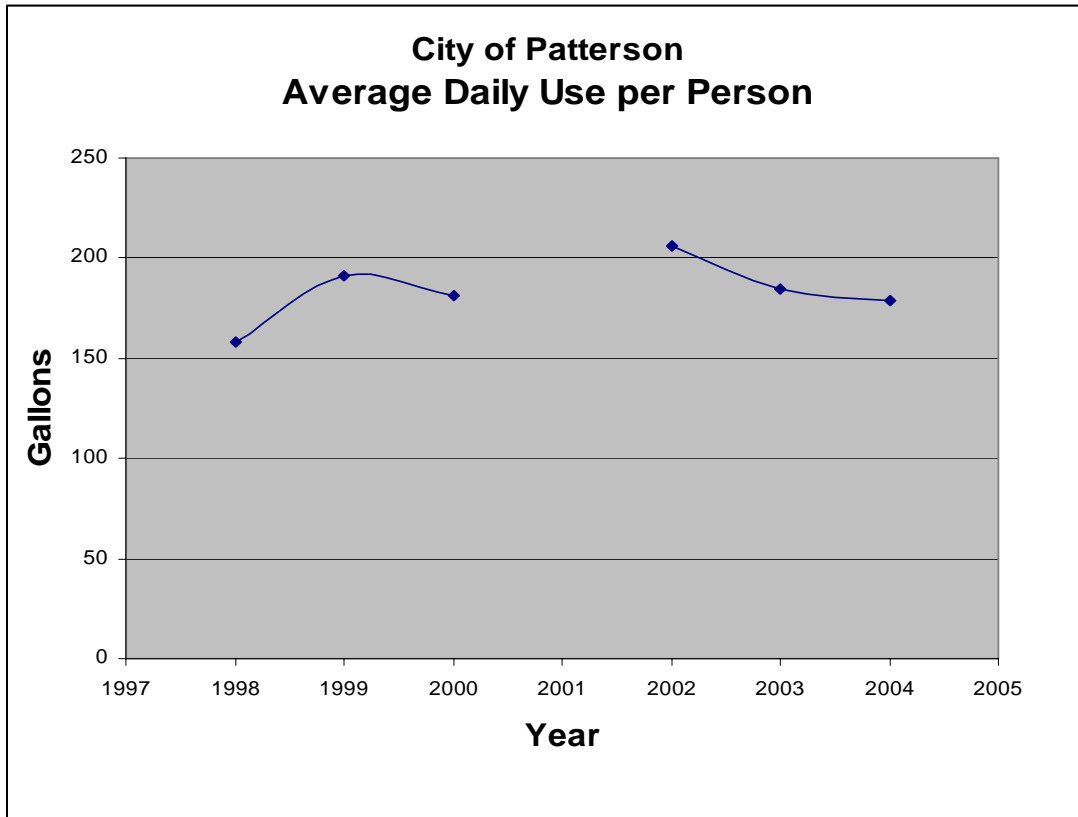


Figure 2: *Pumping records indicated that water use per capita for the City of Patterson is lower than many other Central Valley communities, averaging less than 200 gpcd³³*

For annual water use projections, an average rate of 200 gallons per capita per day was multiplied by population estimates. This results in an average annual use per connection of approximately 0.67 acre-feet per year.³⁴

Annual water use patterns for the City are fairly predictable. Water use increases by approximately 2.5 times from winter to summer, due primarily to residential and

³² Based on total system pumping and includes commercial, industrial, and public uses. Household use of Fresno and Bakersfield range between 250 gpcd and 350 gpcd (DWR, Bulletin 160-98).

³³ City of Patterson, Department of Public Works annual pumping records and Community Planning population records.

³⁴ Assumes a density of 3 persons per household. Course water planning estimates of water use in California range from 0.5 to 1.0 acre-feet per connection annually.

commercial landscape irrigation. Figure 3 shows monthly City water use from 2002 through 2005. There are monthly variations in use due to increases in population during the period,³⁵ and weather (temperature and rainfall). However, the seasonal patterns of use remain constant.

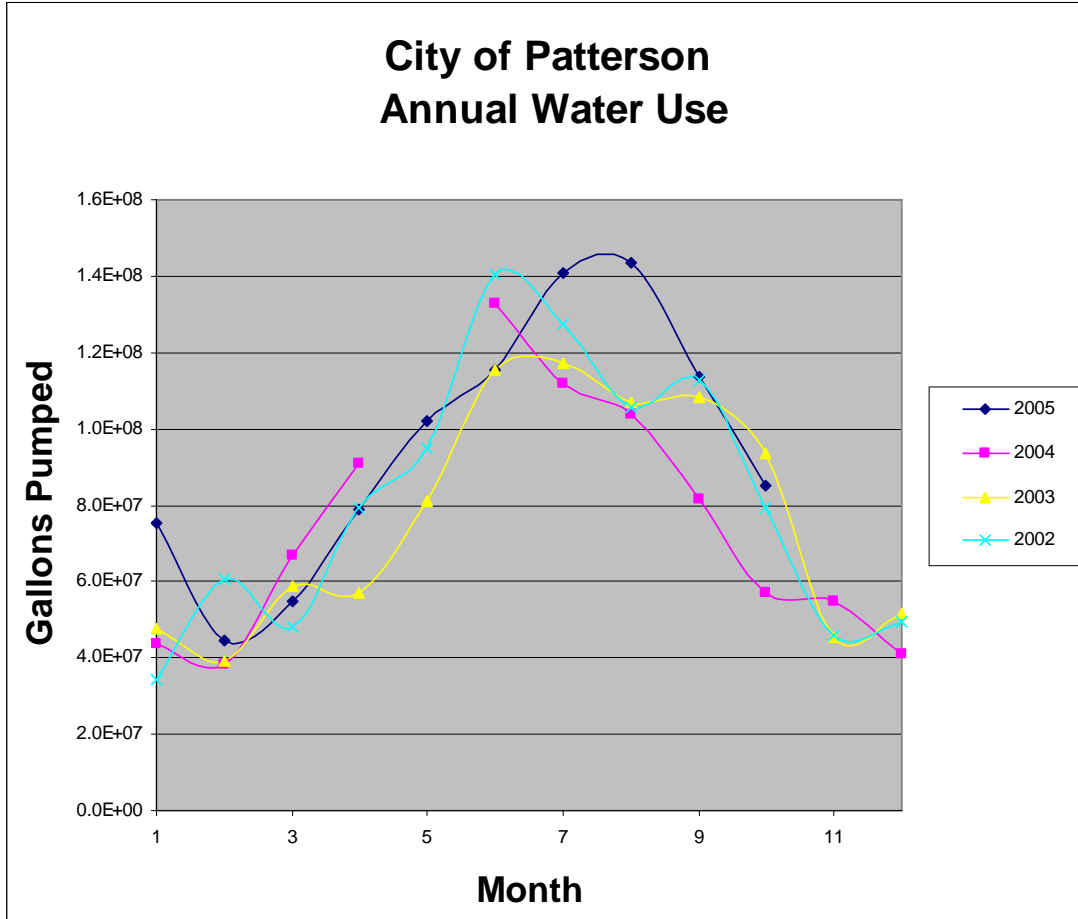


Figure 3: Annual water use patterns for the City from 2002 through 2005. As shown, peak monthly demands can occur during June, July, or August.

As shown in the graph, the capacity of proposed treatment facilities must be designed to meet the highest daily demands that occur between June and August. During other periods of the year, much of the treatment capacity goes unused.

One major concern when projecting future water demands is the possibility that unit demands could increase, thereby underestimating the total system demand. In general, there is a trend toward using less water due to higher prices, water availability, acceptance of water-conserving residential and commercial landscaping, local, state, and

³⁵ City population increased 8.7% from 2002 to 2004, from 13,027 persons to 14,263 persons, per City of Patterson Community Planning records.

national programs to reduce water consumption, general community awareness of resource conservation, etc. The State of California³⁶ has estimated that the average net water use per household in the state will decrease slightly (2%) to moderately (17%) by the year 2030. This is expected to be the result of competing factors that have a net decrease in overall water use. Although income and demographics are expected to drive water use higher, they will be outweighed by decreases driven by price and conservation measures.³⁷ The only condition where there could be an increase in unit demands is due to the introduction of water intense industries to an area. At this time, there is no reason to project that the City’s unit demands will increase due to this condition. In addition, numbers used to determine unit water demands include miscellaneous use, such as construction water and unmeasured losses. The City has experienced a wave of new construction in the last few years, resulting in a high percentage of construction water use.³⁸ Once the City has reached build-out, construction related demands will be insignificant. Thus, for purposes of determining water demands for the study, it is conservative to assume that there will be no long-term increases in unit demands.

The following table provides an estimate of population and demand projections through the year 2030.

Table 5: Water Demand Projections³⁹

	2005	2010	2015	2020	2025	2030
Population	16,150	21,000	25,500	30,000	34,000	35,600
Demand (Ac-ft)	3,250	4,704	5,712	6,720	7,616	8,176

C. Demographic Factors

The City of Patterson is a vibrant, growing community with a rich agriculture heritage. It is among many diverse communities in the Central Valley of California that was established through the hard work and dedication of many individuals committed to a common vision of prosperity and opportunity. It is proud of its provincial setting and strong sense of community. The City is located on Highway 33, along the Interstate 5 corridor, 280 miles north of Los Angeles, 92 miles south of Sacramento, 89 miles southeast of San Francisco and 45 miles southeast of Livermore.

³⁶ State of California, Water Plan Update, Bulletin 160, 2005.

³⁷ Bulletin 160, 2005, Qualified Scenarios of 2030 California Water Demand, page 44 and 45.

³⁸ “Construction Water” is system water that is used for grading, compaction of soil beneath roads and foundations, dust control, concrete and stucco work, pipe flushing, street cleaning, etc.

³⁹ Based on a demand factor of 200 gpcd, approximately 10% higher than historical use (see Figure 5-2).

In 1909, Thomas Patterson subdivided 18,462 acres held by the Patterson Ranch Company into ranches of various sizes and plotted the design of the town of Patterson. Determined to make Patterson different from most, he modeled his town after the radiating street designs of Washington D.C. and Paris, France, designed by the famous French architect and engineer Pierre Charles L'Enfant. Major streets were planted with Palms, Eucalyptus and Sycamore trees. The COP was incorporated in 1919.

With a current population of 16,158 residents, Patterson is a rural, small town surrounded by agricultural land. With agriculture as its primary economic base, orchards of apricots, almonds and walnuts, as well as row crops of dry beans, tomatoes, broccoli, spinach, peas and melons play an important role in Patterson’s history. It is commonly referred to as the “Apricot Capital of the World”.

In recent years, the City has become a bedroom community for residents that chose to work in nearby urban centers but live in a quieter setting. In response, the City has made adjustments in its land use, providing for more residential development as well as the creation of more commercial and industrial opportunities.

C.1 Climate

The City and surrounding Stanislaus County area averages 11.0 inches of rainfall annually. Temperatures range from an average low of 38° F in the winter to an average high in the upper 90's during summer months. Spring and fall are mild with an average high in the low 80's. Mean monthly rates for evapotranspiration and precipitation, and mean temperatures are shown in Table 6.

Table 6: Mean Climate Data for City of Patterson⁴⁰

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total
ETo⁴¹	1.59	2.20	3.66	5.08	6.83	7.80	8.67	7.81	5.67	4.03	2.13	1.59	57.06
Precipitation	2.43	2.04	1.60	0.84	0.34	0.04	0.01	0.02	0.22	0.47	1.31	1.70	11.04
Temperature	45.6	50.9	55.4	60.2	67.3	73.8	77.9	76.4	72.4	64.7	53.4	45.8	NA

Note: Evapotranspiration (ETo) and precipitation in inches, temperature in degrees Fahrenheit.

⁴⁰ Precipitation and temperature based on nearest Western Regional Climate Center station in Newman, CA. Actual precipitation is expected to be slightly less than shown.

⁴¹ California Irrigation Management Information System, Department of Water Resources.

C.2 Land Use and Population

Land use within COP's sphere of influence is directed by the City's General Plan, adopted on June 11, 1992, and updated on September 7, 2005.

According to City of Patterson Community Development records, there has been an average annual increase in population of 7.1% over the past 7 years, with a single population increase of 14.1% in 2005. The population is currently estimated at approximately 16,200 persons (2005).

At full build-out, the General Plan shows a total population of approximately 35,000 persons, with a majority utilizing low-density residential housing. This build-out population is expected to occur sometime between 2025 and 2035, as illustrated in Figure 4.

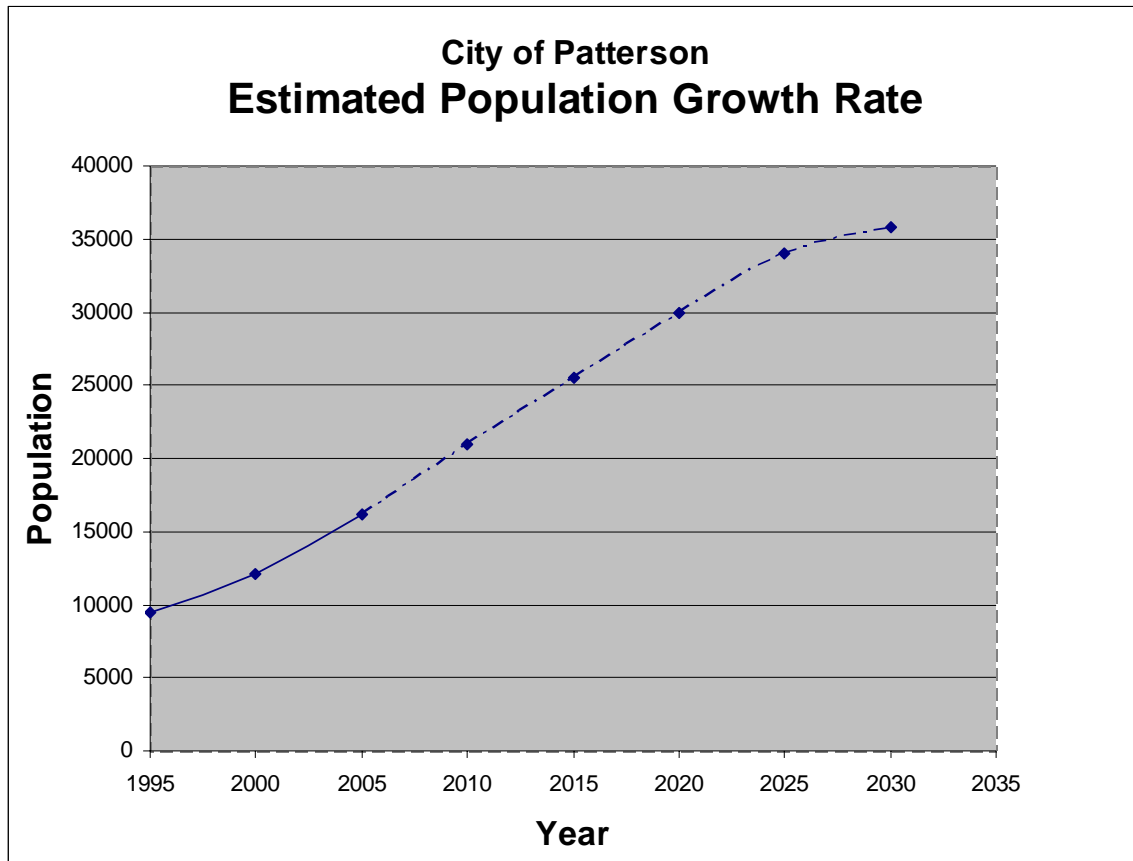


Figure 4: City of Patterson estimate of population growth rate.

D. Dry Year Supplies

The following tables indicate the reliability of supply and impacts due to supply inconsistencies for the City based on the sole use of groundwater. Because the City is proactively seeking the most optimal long-term water supply solution for the community, this is subject to change as the City’s water program evolves. In the event the City determines that supplementing the groundwater with surface water supplies is prudent and advantageous, the source proportions may change. However, lacking specific information as to other sources of water, and given that all studies indicate groundwater will support the ultimate build-out population of the City, groundwater will be identified as the single source of supply in this assessment.

The advantage of groundwater as a primary source of supply is that it is not subject to the same acute reductions that may occur with surface water. All studies indicated that groundwater yields far above projected demands are sustainable.

Table 7: Supply Reliability for 2030 – AF Year

Normal Water Year	Single Dry Water Year	Multiple Dry Water Years			
		Year 1	Year 2	Year 3	Year 4
11,500	11,500	11,500	11,500	11,500	11,500
% of Normal	100.0%	100.0%	100.0%	100.0%	100.0%

Table 8: Basis of Water Year

Water Year Type	Base Year(s)	Historical Sequence
Average Water Year	1981	1961-1991
Single-Dry Water Year	1989	
Multiple-Dry Water Years	1987-1990	

Table 9: Factors Resulting in Inconsistency of Supply

Name of supply	Legal	Environmental	Water Quality	Climatic
Groundwater	None	None	None	None

E. Dry Year Demands

The City has a reliable supply of source water, and is not vulnerability to reductions in deliveries similar to other communities that rely solely or mostly on local or imported surface water, for reasons as described below:

1. The City has sufficient groundwater to meet the needs of the build-out population, and the local groundwater table is not subject to significant impacts due dry or critically dry hydrologic periods;⁴²
2. The draft UWMP assumes sole use of groundwater to meet current and future M&I demands;
3. Potential problems associated with groundwater use are associated with quality, and solutions are addressed in the WPS (See Appendix A);

Because the City has access to a firm yield of groundwater, and all alternatives recommended in the WPS include use of local groundwater for either: 1) permanent build-out of the general plan, or 2) to supplement surface water supplies, including periods when no surface water is available, analysis of water availability during multiple dry year periods is not applicable.

The City has adopted a Drought Contingency Plan (“DCP”) in the event an extended drought has an adverse impact on the local groundwater table, or during a catastrophic supply interruption. The DCP consists of three stages, progressively requiring greater reductions in water use. Table 10 summarizes the DCP.

Table 10: Drought Contingency Plan

RATIONING STAGES		
Stage No.	Actions taken by COP	% Shortage
1	Volunteer Water Rationing	10%
2	Mandatory Water Rationing	20%
3	Mandatory Water Rationing and Water Allocations	20%+

Implementation of the DCP is determined by the City Council, as they deem appropriate. It should be noted that the City may implement water rationing (Stage 1 or Stage 2) even during drought periods when there is no apparent impact to the water table to show support of other Central Valley communities struggling with water shortages.

⁴² Local groundwater basin is in equilibrium, and is not expected to experience decline due to proposed pumping increase for 2030 population demands, based on groundwater studies by DWR and City of Patterson as previously cited herein.

E.1 Catastrophic Supply Interruption Plan

Scenarios causing catastrophic interruptions to the City’s source supply are limited due to the City’s direct access to groundwater, and having multiple wells in the system. The probability of an event that could leave the City without water is extremely low. All recommended alternatives in the WPS include the capability to provide 100% of the system’s demands with groundwater supplies. Therefore, as the City population increases, additional wells will be constructed to account for those demands, regardless of any decision by the City to implement a conjunctive use program. Currently, the City has six (6) operational wells, with plans to construct an additional well in the next year. All water planning activities assume that the largest producing well is out of production during a maximum day condition.

Probable events that could limit the City’s ability to pump groundwater include:

- Electrical power failure (“blackout” or “brownout”);
- Well Pump/motor failure;
- Instrumentation/control system failure;
- Well casing or screen failure.

Of these events, electrical power, mechanical, or control system failures are most probable. The event of most concern is an electrical power failure since it could impact all well and pumping facilities in the system simultaneously, though it typically has the shortest duration. The other failure events are mostly isolated to an individual well facility. The longest repair duration is associated with a well casing or screen failure. Depending on the failure, it could take months to mitigate.

Table 11 provides a summary of potential catastrophic events that could impact source production, and City plans for mitigation.

Table 11: Catastrophic Source Water Failures and Mitigation

Failure Event	Probability	Duration of Outage	Mitigation
Power	High	5 minutes to 3 days	<ul style="list-style-type: none"> • On-site or mobile generators for each well.
Mechanical	Medium	1 to 10 days	<ul style="list-style-type: none"> • Maintain a spare motor(s) • On-call contract with pump repair service
Control	Medium	1 hour to 10 days	<ul style="list-style-type: none"> • Capability to operate all wells manually • Spare programs for SCADA/starters • On-call contract with programmer
Well casing or screen	Low	1 week to 6 months	<ul style="list-style-type: none"> • One redundant well in system

The City also presently maintains 4.5 million gallons of storage and plans to construct additional storage as system demands increase, and will be constructed along with pipelines and wells to meet demands. There are no potable water systems directly adjacent to the City, so opportunities for emergency interties are not available.

Section 6 - Adequacy of Water Supply for Project (Water Code § 10910(c))

SB 610 states that if the projected water demand associated with the proposed project was not accounted for in the most recently adopted urban water management plan, or the public water system has no urban water management plan, the water assessment for the project shall include a discussion with regard to whether the public water system’s total projected water supplies available during normal, single dry, and multiple dry water years during a 20-year projection will meet the projected water demand associated with the proposed project, in addition to the public water system’s existing and planned future uses.

The demand associated with the Villages project is shown in Table 12.

Table 12: Annual Project Demands

Total Dwelling Units	Persons per Dwelling Unit	Project Population	Per Capita Demand (gpdc)	Annual Demand (Ac-ft)
3,100	2.6 ⁴³	8,175	200	1,830

Tables 13 and 14 provide a comparison of available supplies with existing and proposed demands. Table 15 provides a summary of projected supply and demand comparisons.

⁴³ City of Patterson, “Villages of Patterson Initial Study”, 2006

Table 33: Current Supply and Demand (Acre-Feet)

Current Supply and Demand	Normal	Single Dry	Multiple 2	Multiple 3	Multiple 4
Supply Total	11,500	11,500	11,500	11,500	11,500
Demand Total	3,250	3,250	3,250	3,250	3,250
Demand Total (including proposed project)	5,080	5,080	5,080	5,080	5,080
Difference	+8,250	+8,250	+8,250	+8,250	+8,250
Difference (including proposed project)	+6,420	+6,420	+6,420	+6,420	+6,420

Table 44: 20-Year Projection Supply and Demand (Acre-Feet)

Current Supply and Demand	Normal	Single Dry	Multiple 2	Multiple 3	Multiple 4
Supply Total	11,500	11,500	11,500	11,500	11,500
Demand Total	6,370	6,370	6,370	6,370	6,370
Demand Total (including proposed project)	8,200	8,200	8,200	8,200	8,200
Difference	+5,130	+5,130	+5,130	+5,130	+5,130
Difference (including proposed project)	+3,300	+3,300	+3,300	+3,300	+3,300

Table 55: Summary of Water Supply/Demand Projections (Acre-Feet)

	2005	2010	2015	2020	2025	2030
Water Demands	3,250	4,704	5,712	6,720	7,616	8,176
Water Supply	11,500	11,500	11,500	11,500	11,500	11,500
Surplus/<Deficiency>	8,250	6,800	5,790	4,780	3,880	3,320

As stated elsewhere in this assessment, the adequacy of local groundwater supplies are sufficient to support the ultimate build-out population of the City of Patterson, which includes the proposed Villages project. The sustainable groundwater yield is estimated to be 11,500 acre-feet/year, with a project demand (associated with the 2030 build-out population) of 8,200 acre-feet/year. Thus, local groundwater resources exceed demands by approximately 40%.

APPENDIX A

Groundwater Treatment Discussion (Excerpt from 2006 WPS)

Excerpt from City of Patterson, 2006 Water Supply Planning Study, Section 7, pages 25-29, regarding options for treatment of high salt (TDS)

Total Dissolved Solids, Nitrate and Hardness Removal (Groundwater and Surface Water)

Water quality ranged for different wells utilized by the City of Patterson for supplying potable water. The existing groundwater source for the City of Patterson consists of high total dissolved solids (450 to 1,100 mg/L, 75% - 1,000 mg/L). The groundwater has very high hardness (270 to 490 mg/l as CaCO₃) and alkalinity (91 to 260 mg/L as CaCO₃). Chloride and sulfate levels are high also. Based on the discussions held with the City, many residents use home softeners to reduce hardness levels. The salt used in the softeners is generally discharged to the City's wastewater treatment system. The City would prefer to treat water centrally to reduce the salinity loads imposed by softeners on the wastewater system. To meet these goals, two finished water TDS levels were considered, 250 mg/l and 400 mg/L, as discussed in Section 5. At a TDS level of 250 mg/L, the use of softeners will reduce by a large number if not eliminated altogether. At 400 mg/L, partially treated ground water may be blended with either untreated groundwater or treated surface water to reduce the overall costs associated with a water treatment plant and its operations. The 400 mg/L goal will likely result in a reduction in home softeners, but may not be as significant as with the 250 mg/l goal.

A number of treatment options are available to reduce TDS in the groundwater including lime softening, RO membrane treatment, ion-exchange, electro dialysis/electro dialysis reversal (ED/EDR) and distillation. Given the size of the treatment facility of the City, ED/EDR and distillation are not cost effective and are not considered further.

Lime Softening

Lime softening is a chemical precipitation process in which dissolved constituents contributing to hardness are converted to insoluble salts which then are clarified and filtered. Hard water develops scale in distribution system piping and household

plumbing and also created aesthetic issues. Lime softening also removes pathogens, organic precursors to DBPs, and other contaminants such as arsenic and radionuclides. To remove non-carbonate hardness (e.g., sulfate, chloride), lime softening is enhanced by using soda ash. Water can be softened using caustic soda instead of lime and soda ash. After softening, recarbonation (addition of carbon dioxide) of water is generally required to stabilize the water.

Lime softening creates large quantities of sludge (twice the calcium and 2.6 times magnesium levels reported as CaCO_3). The 90th percentile calcium level in the City's groundwater is 226 mg/L as CaCO_3 and the resultant residuals are estimated at 452 mg/L. The 90th percentile magnesium level is 260 mg/L as CaCO_3 and the resultant residuals are estimated at 5,600 lbs. of dry solids per million gallons of water treated.

While lime softening can reduce hardness for the groundwater, it may not be able to reduce the TDS level below 500 mg/L due to high levels of sulfate and chloride. Since calcium sulfate and calcium chloride will be replaced with sodium sulfate and chloride, the TDS level is expected to remain decrease marginally. Lime softening is a feasible treatment process and should be evaluated on bench scale testing before it's considering it with other feasible treatment processes.

Reverse Osmosis

NF treatment process is described in Section 7.6.2 and is generally effective for hardness, TDS, arsenic and bromide. RO membranes can reduce TDS, hardness, arsenic, nitrate, bromide, iron, manganese, thallium (and other metals), organic precursors to DBPs and individual volatile and synthetic organic chemicals. The difference between NF and low pressure RO membranes is their pore size. The majority of principles which apply to NF membranes also apply to RO membranes. RO membranes operate at 150 to 600 psi versus NF membranes which operate between 80 to 150 psi. The water recovery for RO membranes ranges from 30 to 85% and therefore much larger volume of residuals is

produced. Residual treatment and disposal option for RO membrane will be similar to those discussed for NF membranes under section 7.6.2.

RO is a feasible treatment process for control of a number of water contaminants including TDS and nitrate and should be further evaluated in comparison to other feasible treatment technologies and treatment trains.

Ion Exchange Treatment Processes

Ion exchange (IX) can remove inorganic contaminants such as hardness, sulfate, and nitrate. Some level of TDS reduction can also be expected. Two types of IX system exist, cation exchange and anion exchange. Anion exchange systems remove nitrate and sulfate (negatively charge particles in water) while cation exchange systems remove calcium and magnesium (positively charged). IX use synthetic resins in which a presaturant ion on the solid phase, the adsorbent, is exchanged for an unwanted ion in the water. A process schematic of IX is shown in Figure 7.7. In order to accomplish the exchange reaction, a packed bed of IX resin is used. The source water is continually passed through the bed in either a downflow or upflow mode until the IX bed is exhausted, as evidenced by the appearance of a contaminant ion at an unacceptable concentration in the effluent. Anion exchange of chloride (presaturantion) is one of the cost-effective processes for control of nitrate and sulfate from groundwater.

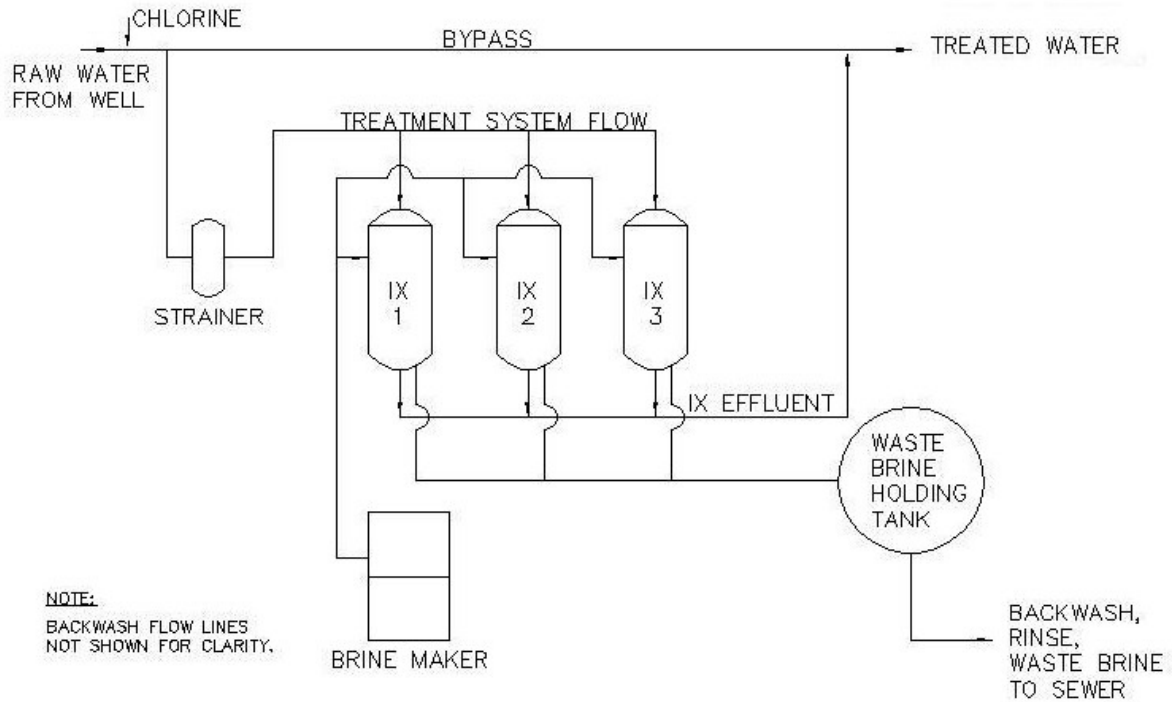


Figure 7-8: Ion Exchange Schematic

Typical anion resins prefer sulfate anions over nitrate for exchange, which results in shorter service run times for waters with high sulfate levels. Since the sulfate levels in the City’s groundwater range between 200 and 300 mg/L a short run length of 100 bed volumes (BVs) is anticipated before the resin is regenerated (approximately three hours of continuous operation).

For control of hardness, a strong acid cation (SAC) IX resin is used. Except for a different resin, the operations and facilities required for an IX system for TDS control is similar to those utilized for nitrate and sulfate.

A typical IX facility operates in the following cycles: 1) service 2) regeneration 3) slow rinse 4) fast rinse, and 5) return to service. Service is in a downflow mode, backwash is in an upflow mode, and regeneration and rinsing is in a downflow mode. When the capacity of the IX bed is exhausted, the column is removed from service and regenerated. Regeneration is performed with sodium chloride solution.

The disposal of spent brine (high concentrations of nitrate, arsenic, TDS and other contaminants) is an important issue for all IX applications in water treatment. The spent brine can generally be evaporated using a lined brine pond or be disposed off-site using a non-hazardous liquid waste hauler.

For the City of Patterson, pressure vessels containing SAC resins will be followed by pressure vessels containing SBA resins for treatment train using IX only. SBA IX resin may also be used after lime softening process to remove hardness. Both these trains are feasible and will be compared with the RO train in terms of their advantages and disadvantages. IX with anion resin will also be considered as a nitrate removal; process, when needed.

APPENDIX B

DWR Delta-Mendota Subbasin Description Bulletin 118

San Joaquin Valley Groundwater Basin Delta-Mendota Subbasin

- Groundwater Subbasin Number: 5-22.07
- County: Stanislaus, Merced, Madera, Fresno
- Surface Area: 747,000 acres (1,170 square miles)

Basin Boundaries and Hydrology

The San Joaquin Valley is surrounded on the west by the Coast Ranges, on the south by the San Emigdio and Tehachapi Mountains, on the east by the Sierra Nevada and on the north by the Sacramento-San Joaquin Delta and Sacramento Valley. The northern portion of the San Joaquin Valley drains toward the Delta by the San Joaquin River and its tributaries, the Fresno, Merced, Tuolumne, and Stanislaus Rivers. The southern portion of the valley is internally drained by the Kings, Kaweah, Tule, and Kern Rivers that flow into the Tulare drainage basin including the beds of the former Tulare, Buena Vista, and Kern Lakes.

The Delta-Mendota subbasin is bounded on the west by the Tertiary and older marine sediments of the Coast Ranges, and on the north by the Stanislaus/San Joaquin county line. The eastern boundary follows the San Joaquin River to Township 11 S, where it jogs eastward and follows the eastern boundary of Columbia Canal company to the San Joaquin River, then follows the Chowchilla Bypass and the eastern border of Farmer's Water District. It then trends southerly through Township 14S Range 15E on the eastern side of Fresno Slough, then follows the Tranquility ID boundary to its southern extremity. Heading northward, it follows the eastern, northern, and northwestern boundary of San Joaquin Valley – Westside Groundwater Subbasin (corresponding with Westlands Water District boundaries). Average annual precipitation is nine to 11 inches, increasing northwards.

Hydrogeologic Information

The San Joaquin Valley represents the southern portion of the Great Central Valley of California. The San Joaquin Valley is a structural trough up to 200 miles long and 70 miles wide filled with up to 32,000 feet of marine and continental sediments deposited during periodic inundation by the Pacific Ocean and by erosion of the surrounding mountains, respectively. Continental deposits shed from the surrounding mountains form an alluvial wedge that thickens from the valley margins toward the axis of the structural trough. This depositional axis is below to slightly west of the series of rivers, lakes, sloughs, and marshes, which mark the current and historic axis of surface drainage in the San Joaquin Valley.

Water Bearing Formations

The geologic units that comprise the ground water reservoir in the Delta-Mendota subbasin consist of the Tulare Formation, terrace deposits, alluvium, and flood-basin deposits. The Tulare Formation is composed of beds, lenses, and tongues of clay, sand, and gravel that have been alternately deposited in oxidizing and reducing environments (Hotchkiss 1971). The Corcoran Clay Member of the formation underlies the basin at depths ranging about 100 to 500 feet and acts as a confining bed (DWR 1981).

Terrace deposits of Pleistocene age lie up to several feet higher than present streambeds. They are composed of yellow, tan, and light-to-dark brown silt, sand, and gravel with a matrix that varies from sand to clay (Hotchkiss 1971). The water table generally lies below the bottom of the terrace deposits. However, the relatively large grain size of the terrace deposits suggests their value as possible recharge sites.

Alluvium is composed of interbedded, poorly to well-sorted clay, silt, sand, and gravel and is divided based on its degree of dissection and soil formation. The flood-basin deposits are generally composed of light-to-dark brown and gray clay, silt, sand, and organic materials with locally high concentrations of salts and alkali. Stream channel deposits of coarse sand and gravel are also included.

Groundwater in the Delta-Mendota subbasin occurs in three water-bearing zones. These include the lower zone, which contains confined fresh water in the lower section of the Tulare Formation, an upper zone which contains confined, semi-confined, and unconfined water in the upper section of the Tulare Formation and younger deposits, and a shallow zone which contains unconfined water within about 25 feet of the land surface (Davis 1959).

The estimated specific yield of this subbasin is 11.8 percent (based on DWR San Joaquin District internal data and Davis 1959). Land subsidence up to about 16 feet has occurred in the southern portion of the basin due to artesian head decline (Ireland 1964).

Restrictive Structures

Groundwater flow was historically northwestward parallel to the San Joaquin River (Hotchkiss 1971). Recent data (DWR 2000) show flow to the north and eastward, toward the San Joaquin River. Based on current and historical groundwater elevation maps, groundwater barriers do not appear to exist in the subbasin.

Groundwater Level Trends

Changes in groundwater levels are based on annual water level measurements by DWR and cooperators. Water level changes were evaluated by quarter township and computed through a custom DWR computer program using geostatistics (kriging). On average, the subbasin water level has increased by 2.2 feet from 1970 through 2000. The period from 1970 through 1985 showed a general increase, topping out in 1985 at 7.5 feet above the 1970 water level. The nine-year period from 1985 to 1994 saw general declines in groundwater levels, reaching back down to the 1970 groundwater level in 1994. Groundwater levels rose in 1995 to about 2.2 feet above the 1970 groundwater level. Water levels fluctuated around this value until 2000.

Groundwater Storage

Estimations of the total storage capacity of the subbasin and the amount of water in storage as of 1995 were calculated using an estimated specific yield of 11.8 percent and water levels collected by DWR and cooperators.

According to these calculations, the total storage capacity of this subbasin is estimated to be 30,400,000 af to a depth of 300 feet and 81,800,000 af to the base of fresh groundwater. These same calculations give an estimate of 26,600,000 af of groundwater to a depth of 300 feet stored in this subbasin as of 1995 (DWR 1995). According to published literature, the amount of stored groundwater in this subbasin as of 1961 is 51,000,000 af to a depth of \leq 1,000 feet (Williamson 1989).

Groundwater Budget (Type B)

Although a detailed budget was not available for this subbasin, an estimate of groundwater demand was calculated based on the 1990 normalized year and data on land and water use. A subsequent analysis was done by a DWR water budget spreadsheet to estimate overall applied water demands, agricultural groundwater pumpage, urban pumping demand and other extraction data.

Natural recharge is estimated to be 8,000 af. Artificial recharge and subsurface inflow are not determined. Applied water recharge is approximately 74,000 af. Annual urban and agricultural extractions estimated to be 17,000 af and 491,000 af, respectively. Other extractions are approximately 3,000 af, and subsurface outflow is not determined.

Groundwater Quality

Characterization. The groundwater in this subbasin is characterized by mixed sulfate to bicarbonate types in the northern and central portion with areas of sodium chloride and sodium sulfate waters in the central and southern portion. TDS values range from 400 to 1,600 mg/L in the northern portion of the subbasin and from 730 to 6,000 mg/L in the southern portion of the subbasin (Hotchkiss 1971). The Department of Health Services (DHS), which monitors Title 22 water quality standards, reports TDS values in 44 public supply wells to range from 210 to 1,750 mg/L, with an average value of 770 mg/L. A typical range of water quality in wells is 700-1,000 mg/L.

Impairments. Shallow, saline groundwater occurs within about 10 feet of the ground surface over a large portion of the subbasin. There are also localized areas of high iron, fluoride, nitrate, and boron in the subbasin (Hotchkiss 1971).

Water Quality in Public Supply Wells

Constituent Group¹	Number of wells sampled²	Number of wells with a concentration above an MCL³
Inorganics – Primary	47	2
Radiological	47	1
Nitrates	51	4
Pesticides	47	1
VOCs and SVOCs	45	0
Inorganics – Secondary	47	18

¹ A description of each member in the constituent groups and a generalized discussion of the relevance of these groups are included in *California's Groundwater – Bulletin 118* by DWR (2003).

² Represents distinct number of wells sampled as required under DHS Title 22 program from 1994 through 2000.

³ Each well reported with a concentration above an MCL was confirmed with a second detection above an MCL. This information is intended as an indicator of the types of activities that cause contamination in a given basin. It represents the water quality at the sample location. It does not indicate the water quality delivered to the consumer. More detailed drinking water quality information can be obtained from the local water purveyor and its annual Consumer Confidence Report.

Well Characteristics

Well yields (gal/min)		
Municipal/Irrigation	Range: 20 – 5,000	Average: 800-2,000
Total depths (ft)		
Domestic		
Municipal/Irrigation	Range: 50 - 800	Average: 400-600

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
DWR (incl. Cooperators)	Groundwater levels	816 Semi-annually
DWR (incl. Cooperators) Department of Health Services (incl. Cooperators)	Mineral, nutrient, & minor element. Title 22 water quality	120 Varies

Basin Management

Groundwater management: Panoche Water District is approximately 11 months into the AB3030 process and will be doing a joint plan with other districts and the county. [San Luis and Delta-Mendota Water Authority North](#) adopted an AB 3030 plan on December 5, 1997.

Water agencies

Public

Merced County, Fresno County, Broadview WD, Centinella WD, Central California ID, Davis WD, Del Puerto WD, Eagle Field WD, El Solyo WD, Farmers WD, Firebaugh Canal WD, Foothill WD, Fresno Slough WD, Grasslands WD, Hospital WD, Kern Canon WD, Laguna WD, Mercy Springs WD, Mustang WD, Oak Flat WD, Orestimba WD, Oro Loma WD, Pacheco WD, Panoche WD, Patterson WD, Romero WD, Salado WD, San Luis Canal Company, San Luis WD, Santa Nella C.WD, Sunflower WD, Tranquility ID, West Stanislaus ID, Widren WD, Quinto WD

Private

None.

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Additional References

- California Department of Water Resources (DWR). 1994. Bulletin 160-93. *California Water Plan Update, Volume 1*.
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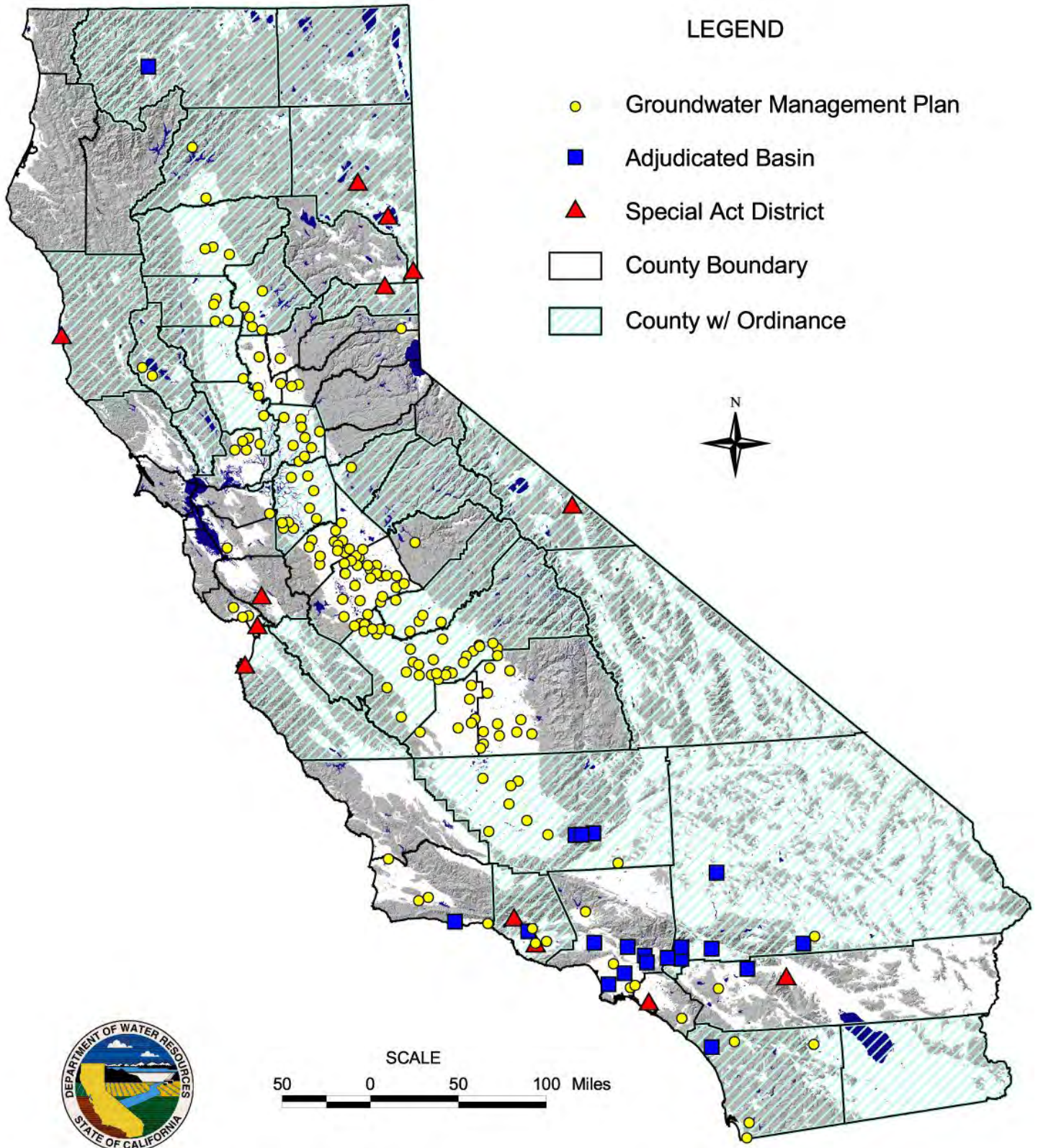
Errata

Updated groundwater management information and added hotlinks to applicable websites.
(1/20/06)

APPENDIX C

California Groundwater Management Status

Status of Groundwater Management in California



Status of Groundwater Management in California
(as of December 2004)

Counties with Groundwater Management Ordinances

Alpine	Glenn	Lassen	Monterey	San Diego	Tehama
Butte	Imperial	Madera	Napa	San Joaquin	Tuolumne
Calaveras	Inyo	Mendocino	Sacramento	Shasta	Yolo
Colusa	Kern	Modoc	San Benito	Sierra	
Fresno	Lake	Mono	San Bernardino	Siskiyou	

Special Act Districts

District	County
Desert Water Agency	Riverside
Fox Canyon Ground Water Management Agency	Ventura
Honey Lake Groundwater Management District	Lassen
Long Valley Groundwater Management District	Lassen
Mendocino City Community Services District	Mendocino
Mono County Tri-Valley Groundwater Management District	Mono
Monterey Peninsula Water Management District	Monterey
Ojai Groundwater Management Agency	Ventura
Orange County Water District	Orange
Pajaro Valley Water Management Agency	Santa Cruz
Santa Clara Valley Water District	Santa Clara
Sierra Valley Groundwater Management District	Sierra
Willow Creek Groundwater Management Agency	Lassen

Adjudicated Basins

Basin	County
Beaumont	Riverside
Brite Basin	Kern
Central Basin	Los Angeles
Chino Basin	San Bernardino
Cucamonga Basin	San Bernardino
Cummings Basin	Kern
Goleta Basin	Santa Barbara
Main San Gabriel Basin	Los Angeles
Mojave Basin Area Adjudication	San Bernardino
Puente Basin	Los Angeles
Raymond Basin	Los Angeles
San Bernardino Basin Area	San Bernardino
Santa Margarita River Watershed	San Diego
Santa Paula Basin	Ventura
Scott River Stream System	Siskiyou
Six Basins	Los Angeles
Tehachapi Basin	Kern
Upper Los Angeles River Area	Los Angeles
Warren Valley Basin	San Bernardino
West Coast Basin	Los Angeles

Districts/Agencies with Adopted Groundwater Management Plans

Name	County
Alameda County Water District	Alameda
Alpaugh Irrigation District	Tulare
Alta Irrigation District and Water Conservation District	Tulare
Anderson-Cottonwood Irrigation District	Shasta
Angiola Water District	Tulare
Arden-Cordova Water Service	Sacramento
Arvin-Edison Water Storage District	Kern
Atwell Island Water District	Tulare
Ballico Community Services District	Merced
Ballico-Cortez Water District	Merced
Banta-Carbona Irrigation District	San Joaquin
Bear Valley Community Services District	Mariposa
Big Valley GWMP	Lake
Biggs-West Gridley Water District	Butte
Black Rascal Water Company	Merced
Borrego Water District	San Diego
Broadview Water District	Fresno
Brophy Water District	Yuba
Burrel Ditch Company	Fresno
Butte County Dept. of Water & Resource Conservation	Butte
Butte Water District	Butte
Byron-Bethany Irrigation District	Contra Costa
Calaveras County Water District	Calaveras
Camrosa Water District	Ventura
Carmichael Water District	Sacramento
Carpinteria Valley Water District	Santa Barbara
Cawelo Water District	Kern
Central California Irrigation District	Merced
Central Sacramento County Groundwater Forum	Sacramento
Central Water District	Santa Cruz
Chowchilla Water District	Madera
Chowchilla-Red Top Resource Conservation District	Madera
Citrus Heights Water District	Sacramento
City of Atwater	Merced
City of Buellton	Santa Barbara
City of Ceres	Stanislaus
City of Corcoran	Kings
City of Folsom	Sacramento
City of Galt	Sacramento
City of Hughson	Stanislaus
City of Lincoln	Placer

Name (Districts/Agencies with Adopted Groundwater Management Plans)	County
City of Livingston	Merced
City of Merced	Merced
City of Tracy	San Joaquin
City of Turlock	Stanislaus
City of Vacaville	Solano
Clay Water District	Sacramento
Columbia Canal Company	Madera
Consolidated Irrigation District	Fresno
Corcoran Irrigation District	Kings
County of Fresno	Fresno
County of Glenn	Glenn
County of Merced	Merced
County of Stanislaus	Stanislaus
Crescent Canal Company	Fresno
Deer Creek Irrigation District	Tehema
Del Puerto Water District	Stanislaus
Delhi County Water District	Merced
Denair Community Services District	Stanislaus
Eagle Field Water District	Merced
East Merced Resource Conservation District	Merced
Eastern Municipal Water District	Riverside
Eastside Water District	Merced
El Camino Irrigation District	Tehama
EL Nido Irrigation District	Merced
Elk Grove Water Works	Sacramento
Fair Oaks Water District	Sacramento
Firebaugh Canal Water District	Fresno
Fox Canyon Groundwater Management Agency	Ventura
Fresno Irrigation District	Fresno
Galt Irrigation District	Sacramento
Glenn-Colusa Irrigation District	Glenn
Gravelly Ford Water District	Madera
Hills Valley Irrigation District	Fresno
Hilmar County Water District	Merced
James Irrigation District	Fresno
Joshua Basin Water District	San Bernardino
Kaweah Delta Water Conservation District	Tulare
Kern Delta Water District	Kern
Keyes Community Services District	Stanislaus
Kings County Water District	Kings
Kings River Conservation District	Fresno
Kings River Water District	Fresno
Lake County Flood Control and Water Conservation District	Lake

Name (Districts/Agencies with Adopted Groundwater Management Plans)	County
Lakeside Irrigation Water District	Kings
LeGrand Community Services District	Merced
LeGrand-Athlone Water District	Merced
Liberty Canal Company	Fresno
Liberty Mill Race Company	Fresno
Liberty Water District	Fresno
Los Angeles County Flood Control District	Los Angeles
Los Angeles Department of Water and Power	Los Angeles
Lower Tule River Irrigation District	Tulare
Madera Water District	Madera
Maine Prairie Water District	Solano
Meadowbrook Water Company	Merced
Melga Water District	Kings
Merced Groundwater Basin GWMP	Merced
Merced Irrigation District	Merced
Mercy Springs Water District	Fresno
Merquin County Water District	Merced
Mid-Valley Water District	Fresno
Modesto Irrigation District	Stanislaus
Newhall County Water District	Los Angeles
North Kern Water Storage District	Kern
North San Joaquin Water Conservation District	San Joaquin
Oakdale Irrigation District	Stanislaus
Omochumne-Hartnell Water District	Sacramento
Ora Loma Water District	Fresno
Orange County Water District	Orange
Orange Cove Irrigation District	Fresno
Orangevale Mutual Water Company	Sacramento
Pacheco Water District	Merced
Panoche Water District	Fresno
Patterson Water District	Stanislaus
Pixley Irrigation District	Tulare
Plain View Water District	San Joaquin
Planada Community Services District	Merced
Pleasant Valley Water District	Fresno
Porterville Irrigation District	Tulare
Princeton-Cordora-Glenn Irrigation District	Glenn
Raisin City Water District	Fresno
Rancho Murieta Community Services District	Sacramento
Reclamation District 108	Colusa
Reclamation District 1500	Sutter
Reclamation District 2035	Yolo
Reclamation District 2068	Solano

Name (Districts/Agencies with Adopted Groundwater Management Plans)	County
Reclamation District 787	Sutter
Reed Ditch Company	Fresno
Richvale Irrigation District	Butte
Rio Linda Water District	Sacramento
Riverdale Irrigation District	Fresno
Root Creek Water District	Madera
Rosamond Community Services District	Kern
Rosedale-Rio Bravo Water Storage District	Kern
Sacramento Groundwater Authority	Sacramento
San Joaquin County Flood Control & Water Conservation District	San Joaquin
San Juan Water District	Placer
San Luis Canal Company	Merced
San Luis Rey Municipal Water District	San Diego
San Luis Water District	Merced
Santa Maria Valley Water Conservation District	Santa Barbara
Santa Ynez River Water Conservation District	Santa Barbara
Saucelito Irrigation District	Tulare
Scotts Valley Water District	Santa Cruz
Semitropic Water Storage District	Kern
Shasta County Water Agency	Shasta
Solano County Dept. of Environmental Management	Solano
Solano Irrigation District	Solano
Soquel Creek Water District	Santa Cruz
South San Joaquin Irrigation District	San Joaquin
South Sutter Water District	Sutter
Stevinson Water District	Merced
Stinson Canal and Irrigation Company	Fresno
Stockton East Water District	San Joaquin
Stone Corral Irrigation District	Tulare
Sutter Extension Water District	Sutter
Sweetwater Authority	San Diego
Tehama County Flood Control	Tehama
Terra Bella Irrigation District	Tulare
Tia Juana Valley County Water District	San Diego
Tri-Valley Water District	Fresno
Truckee-Donner Public Utility District	Nevada
Tulare Lake Basin Water Storage District	Kings
Turlock Irrigation District	Stanislaus
Turner Island Water District	Merced
United Water Conservation District	Ventura
Water Replenishment District of Southern California	Los Angeles
West Kern Water District	Kern
West Placer	Placer

Name (Districts/Agencies with Adopted Groundwater Management Plans)	County
West Side Irrigation District	San Joaquin
West Stanislaus Irrigation District	Stanislaus
Western Canal Water District	Glenn
Westlands Water District	Fresno
Widren Water District	Fresno
Winton Water and Sanitation District	Merced
Woodbridge Irrigation District	San Joaquin

APPENDIX D

City of Patterson General Plan



The City of Patterson General Plan

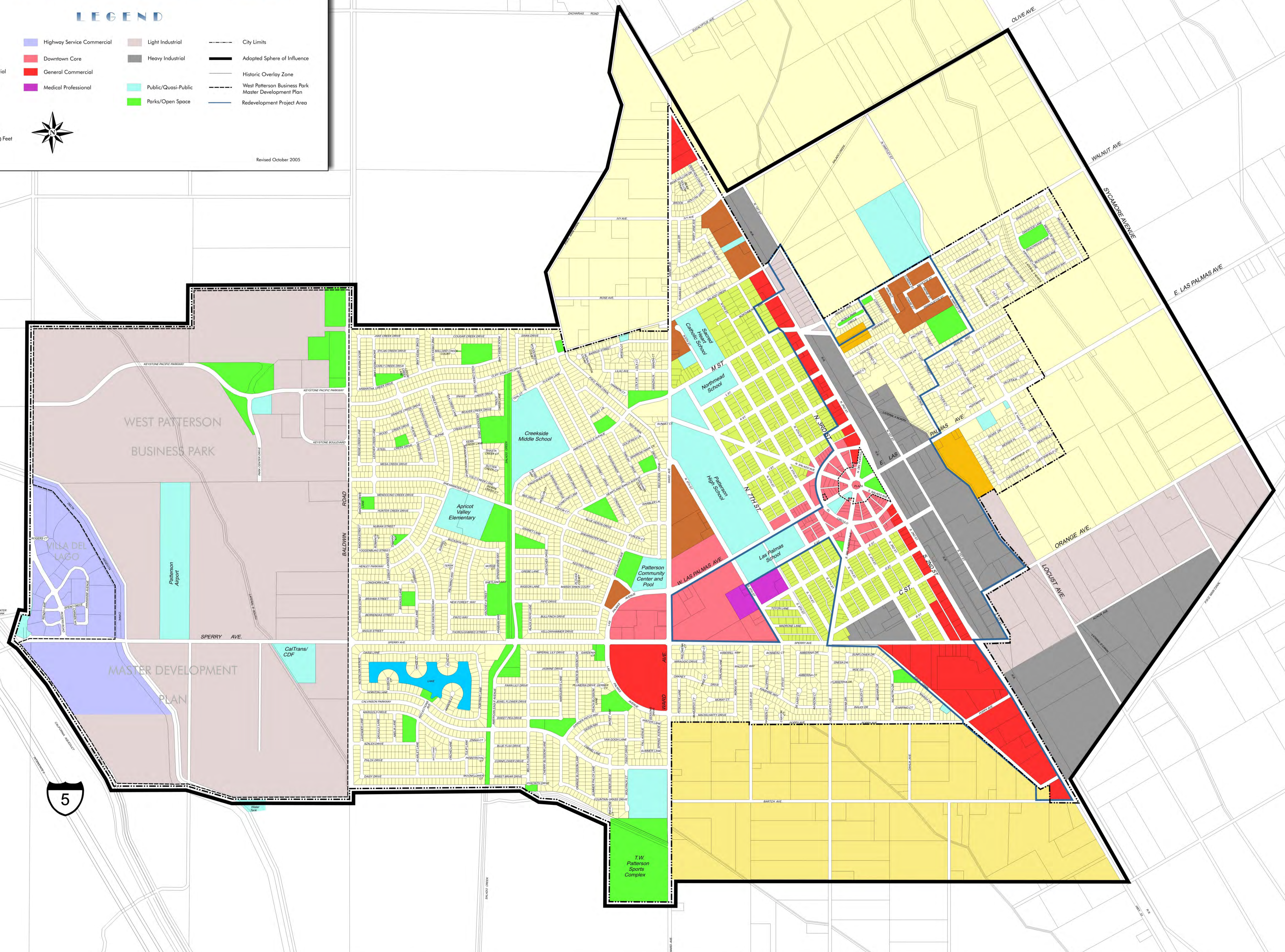
LEGEND

- | | | | |
|----------------------------|----------------------------|---------------------|--|
| Estate Residential | Highway Service Commercial | Light Industrial | City Limits |
| Low Density Residential | Downtown Core | Heavy Industrial | Adopted Sphere of Influence |
| Medium Density Residential | General Commercial | Public/Quasi-Public | Historic Overlay Zone |
| High Density Residential | Medical Professional | Parks/Open Space | West Patterson Business Park Master Development Plan |
| Downtown Residential | | | Redevelopment Project Area |

0 660 1320 Feet



Revised October 2005



APPENDIX E

**Excerpt from
“City of Patterson, Development Impact Fee
Justification Study, 2005”, and
Resolution 2006-19**

VIII. Water, Wastewater and Storm Drainage

City of Patterson Water Supply and Production Resources

The City derives all of its water supply from the Delta-Mendota Groundwater Basin (Basin), as defined by the Department of Water Resources (DWR) in Bulletin 118-80 (DWR, Jan. 1980).

The City currently operates five groundwater wells east of the City limits, with nominal capacities ranging from 600 gallons per minute (gpm) in Well 6 to 1,600 gpm in Well 5 and total nominal capacity of 5,200 gpm.

Water is delivered to customers directly from the City's wells, without treatment. Two hydropneumatic tanks (13,000 gallons and 5,000 gallons) allow water to be fed to the distribution system at a constant pressure. The distribution system consists primarily of asbestos-cement and steel pipe, ranging from two to ten inches in diameter (Bookman-Edmonston Engineering, May 1992).

On August 6, 2002, the Patterson City Council adopted an Urban Water Management Plan pursuant to the Urban Water Management Planning Act. The UWMP evaluates past, present, and projected water demand and supply in five-year increments through the year 2020; the costs and reliability of the supply; and the City's conservation efforts, water shortage responses, and use of recycled water. Based on an evaluation of the City's groundwater resources, the UWMP concluded that the City's groundwater is sufficient to serve buildout of the City's General Plan. Nevertheless, the UWMP concluded that surface water would be a superior source of supply and noted that the City has begun negotiations with water providers in the region in pursuit of potential surface water transfers.

If existing plus approved development demand were to continue unchanged indefinitely, groundwater meeting Domestic Water Quality Standards would likely be exhausted at some point between 2009 and 2014. The 2009 date corresponds to the estimate of 30,000 acre-feet of adequate quality groundwater, while the 2014 date corresponds to the 50,000 acre-foot estimate. In sum, the City's existing water supply is not believed to be sufficient to supply existing demand much beyond the early part of the next decade. In 2020, total water demand in the City's General Plan (cumulative demand) is anticipated to be approximately 7,589 afa (Stoddard & Assocs., Aug. 2002a), 3,989 afa beyond the existing plus approved development demand baseline and. The City's UWMP uses 2020 as a very conservative estimate of buildout of the City's amended sphere of influence. The conservative 2020 buildout date was used to ensure that sufficient water supplies are available before, rather than after, they are needed (Stoddard & Assocs., Aug. 2002a).

To serve cumulative demand, the City would continue to rely on its groundwater, with installation of treatment systems before groundwater quality deteriorates to a level that will no longer support the City's uses, likely between 2008 and 2012. Existing wells (estimated to be seven to nine in number by the time treatment would become necessary) would be maintained and two new wells installed thereafter by 2020, which would also tap the deep, confined aquifer. Wells would be located to optimize the quality of groundwater pumped and to minimize the potential adverse effects of pumping.

Before water quality became unacceptable, existing wells would be retrofitted with wellhead desalination systems. New wells coming on line would similarly be equipped with the treatment systems. Using reverse osmosis, the systems would remove sufficient dissolved

solids and other constituents of concern to allow the resulting water to satisfy Department of Health Services primary and mandatory secondary drinking water standards. Wellhead treatment would avoid the need to construct and operate a centralized treatment plant, and treated water could be conveyed directly to the end customer via the City's conveyance infrastructure planned for in the City's Water Master Plan.

The City's Urban Water Management Plan, and the Water Supply Assessment prepared for the West Patterson Business Park Master Development Plan area and surrounding development, (incorporated by reference) identified rough estimates of the costs associated with groundwater treatment. Although the costs of treatment would be high, the UWMP and Assessment concluded that groundwater treatment remains a feasible source of supply. More precise cost estimates must await more detailed engineering evaluation and identification of the particular treatment technology and brine disposal method to be used.

Another water supply option that could be considered in the future is for the City to obtain surface water rights sufficient to meet future demand. As discussed in the Urban water management Plan, the City would need to obtain entitlements to a surplus of water, about 13,000 acre-feet per year, to ensure that average deliveries would meet the City's projected cumulative demand of 7,589 acre-feet per year.

Both options (treatment of groundwater and surface water) are described in detail in the City's Urban Water Management Plan which is incorporated by reference and available for review at the City Planning Department, 33 S. Del Puerto.

More recently, the City's engineering consultants prepared cost estimates for water supply infrastructure necessary to serve buildout of the General Plan area. The estimates include the cost of acquiring an entitlement to surface water to supplement groundwater resources. In addition, the costs include necessary facilities to treat groundwater to acceptable drinking water standards.

The City's Wastewater System

The City of Patterson provides wastewater collection, treatment and disposal service for all residents, schools, commercial and industrial establishments in the City except for Patterson Frozen Foods, which has its own onsite treatment system, and a few residences, which are served by their own onsite septic tank systems. The City's wastewater system also serves the Villa Del Lago commercial development located near the I-5/Sperry Avenue interchange. The City's wastewater system consists of three basic components: collection, treatment, and disposal.

The City's wastewater collection system consists of gravity flow pipelines ranging in size from 6-inch to 33-inch diameters, typically located in City street rights-of-way. Older portions of the system, which generally serve the downtown core residential and commercial areas, were constructed before 1960. Newer developments have been connected to the system over time.

The City's wastewater treatment plant is located on a 160-acre site situated between Walnut and Las Palmas Avenues, east of Poplar Avenue and west of the San Joaquin River. The plant's currently permitted capacity is 1.3 million gallons per day (mgd), and the average current volume of wastewater produced by the City is approximately 0.8 mgd. The remaining capacity is available to provide service for previously-approved expansion and to accommodate unanticipated high flow conditions. Wastewater is treated using two types of treatment processes, each principally an aerated biological treatment system. The older system, with a

permitted capacity of 0.8 mgd, consists of an activated sludge process followed by clarification. The newer system is an advanced integrated pond system (AIPS), with a permitted capacity of 0.5 mgd.

In 1992, the City of Patterson prepared the *Wastewater System Master Plan* (City of Patterson, 1992) to provide guidance for future expansion of its existing wastewater collection, treatment and disposal system to accommodate expected development in the City's General Plan Area. The Wastewater System Master Plan found:

The existing collection system is considered adequate to serve the existing service area including infill. For planning purposes, capacity is not available other than on an interim case by case basis for new development in the General Plan growth area (City of Patterson, 1992; page 2-2).

The Master Plan also included a staged implementation program to meet the City's future treatment capacity needs, but recommended periodic review to incorporate revisions that may be appropriate due to changing future conditions. Over the last several years, a substantial amount of development has occurred in the western portion of the City. The sewer collection pipe sizes constructed for the new developments generally followed the recommendations set forth in the Master Plan, and some of the pipes were oversized to assist in providing sewage collection service for future development on the west side of the City.

In 2001, the City prepared the *Western Expansion Area Sanitary Sewer Collection System* report (City of Patterson, 2001) to determine the most cost effective way of providing sewage collection to the west side of the City's General Plan Area as it may be amended by the West Patterson Business Park Master Development Plan using the oversized sewer lines constructed since the 1992 Master Plan was developed. This report recommended an expansion of the sewer collection system. Under this system, the existing 15-inch and 21-inch sewer lines running through the Heartland Ranch (formerly Patterson Ranch) development would be loaded to near maximum capacity, and the 27-inch line in M Street would be loaded slightly above capacity. Therefore new collection pipeline would be required to serve the Master Development Plan area.

More recently, the City's engineering consultants prepared cost estimates for wastewater collection and treatment infrastructure necessary to serve buildout of the General Plan. These costs include conveyance infrastructure (collection pipes, pump stations, etc.) as well as improvements to the capacity of the treatment plant.

Storm Drainage

In 1992, the City prepared a Storm Water Master Development Plan that identifies the drainage improvements necessary to accommodate buildout of the City's sphere of influence in accordance with the General Plan. The Master Plan recommends a combination of open channels and underground drainage pipes to mitigate the drainage impacts associated with buildout of the City.

The Storm Water Master Plan was modified with the approval of the Creekside Annexation and subsequent development agreement between the City and the developer of Patterson Ranch, the largest sub-area of the Creekside.

More recently, the Storm Water Master Plan was amended to identify drainage infrastructure and associated costs necessary to accommodate buildout of the City's General Plan.

Fee Calculations

Costs for water supply, wastewater collection and treatment and storm drainage infrastructure necessary serve buildout of the City in accordance with the General Plan were prepared by the City's engineering consultant in 2005. The costs were derived for undeveloped portions of the Plan area and are divided among land use types, inclusive of the land uses contemplated by The Villages of Patterson project currently under review by the City. Since all of the infrastructure needs to serve buildout are necessitated by new development the entire cost is allocated to each newly constructed dwelling unit and square foot of non-residential development.

Table 14 -- Water Supply Impact Fees

Facility	Cost To Serve Remaining Development		Remaining Dwelling Units	Fee Per Unit	Remaining Non-Residential Floor Area (sq.ft.)		Fee Per Square Foot of Non-Residential Development	
	Residential	Commercial			Industrial	Commercial	Industrial	Commercial
Water Pipes	\$27,173,779	\$2,365,093	3,507	\$7,748.44	555,390	6,899,795	\$4.26	\$3.91
Water Supply Entitlement	\$8,421,530	\$470,310		\$2,401.35			\$0.85	\$0.98
Water Treatment	\$11,767,672	\$627,080		\$3,355.48			\$1.13	\$1.33
Total	\$47,362,981	\$3,462,483		\$13,505			\$6.24	\$6.22

Table 15 -- Wastewater Collection and Treatment Impact Fees

Facility	Cost To Serve Remaining Development		Remaining Dwelling Units	Fee Per Unit	Remaining Non-Residential Floor Area (sq.ft.)		Fee Per Square Foot of Non-Residential Development	
	Residential	Commercial			Industrial	Commercial	Industrial	Commercial
Wastewater Collection Pipes	\$5,020,716	\$434,224	3,507	\$1,431.63	555,390	6,899,795	\$0.78	\$0.68
Wastewater Treatment	\$10,083,615	\$740,089		\$2,875.28			\$1.33	\$1.81
Total	\$15,104,331	\$1,174,313		\$4,307			\$2.11	\$2.49

Table 16 -- Storm Drainage Impact Fees

Facility	Cost To Serve Remaining Development		Remaining Dwelling Units	Fee Per Unit	Remaining Non-Residential Floor Area (sq.ft.)		Fee Per Square Foot of Non-Residential Development	
	Residential	Commercial			Industrial	Commercial	Industrial	Commercial
Stormwater Collection Pipes	\$18,864,225	\$2,010,007	3,507	\$5,379.02	555,390	6,899,795	\$3.62	\$4.11

IX. Conclusion/Recommendations

Table 17 -- Summary Comparison of Existing and Recommended Fees for Residential and Typical Non-Residential Development

Fee Category	Residential Fees			Non-Residential Fee per Square Foot (typical)		
	Existing	Recommended	Difference	Existing	Recommended	Difference
General Government	\$459.00	\$1,073.00	\$614.00	\$0.14	\$0.23	\$0.09
Community Facilities	\$1,036.00	\$4,001.00	\$1,952.00	--	--	--
Police	\$146.00	\$70.00	(\$70.00)	\$0.05	\$0.04	(\$0.01)
Fire	\$365.00	\$457.00	\$92.00	Small 0.12 Large 0.26	Small \$0.16 Large \$0.35	Small \$0.04 Large 0.09
Park Acquisition	\$478.00	\$3,688.00	\$2,086.00	--	--	--
Park Development	\$1,140.00	\$2,645.00	\$1,505.00	--	--	--
Affordable Housing	\$734.00	\$20,946.00	\$20,212.00	--	--	--
Water Supply	\$2,282.00	\$13,505.00	\$11,223.00	\$7,079 per acre	\$6.23	varies
Wastewater	\$2,800.00	\$4,307.00	\$1,507.00	2800+1.00/sq.ft. Over 3000 sq.ft.	\$2.11	varies
Storm Drainage	\$1,938.00	\$5,379.00	\$3,441.00	17,442 per acre	\$3.62	varies
I-5 Interchange	\$500.00	\$43.00	(\$457.00)	varies	\$0.36	varies
Traffic	\$0.00	\$3,879.00	\$3,879.00	varies	\$2.04	varies
TOTAL:	\$11,878.00	\$59,993.00	\$45,954.00		Small \$14.79 Large \$14.98	

Notes:

1. Excludes school development impact fee, County Public Facility Fee.
2. Reflects more refined (and lower) costs for sports complex facilities.

RESOLUTION NO. 2006-19

A RESOLUTION OF THE CITY COUNCIL
OF THE CITY OF PATTERSON ADOPTING A NEGATIVE
DECLARATION AND ADOPTING THE
2005 DEVELOPMENT IMPACT FEE
JUSTIFICATION STUDY AND APPROVING
CERTAIN REVISIONS TO THE CITY'S
DEVELOPMENT IMPACT FEES

WHEREAS, the City of Patterson has adopted fees to be charged new development in accordance with California Government Code Section 66000 et seq;

WHEREAS, the purpose of the fees is to ensure that public facilities necessary to accommodate such new development are provided concurrently or in advance of such development, as required by relevant policies of the Patterson General Plan;

WHEREAS, the City has caused to be prepared a *2005 Development Impact Fee Justification Study* which is attached hereto and incorporated herein by reference;

WHEREAS, the *2005 Development Impact Fee Justification Study* provides supporting evidence in accordance with Government Code Section 66000 et seq which explains the purpose of each fee, the use to which the fee will be put, the relationship between the fee's use and the type of development upon which the fee will be imposed, and the relationship between the need for the public facility and the type of development upon which the fee will be imposed;

WHEREAS, the City Council held a duly noticed public hearing on October 20, 2005 and March 7, 2006 to consider the *2005 Development Impact Fee Justification Study* and recommended fees;

WHEREAS, the *2005 Development Impact Fee Justification Study* and recommended fee revisions constitute a project as defined by relevant provisions of the California Environmental Quality Act (CEQA);

WHEREAS, a draft Negative Declaration has been prepared for this project in accordance with the California Environmental Quality Act, Public Resources Code Section 21000 et seq;

WHEREAS, the draft Negative Declaration was circulated for public review in accordance with the California Environmental Quality Act, Public Resources Code Section 21000 et seq;

WHEREAS, the City Council has considered the draft Negative Declaration and all comments received on the draft;

WHEREAS, the conclusions of the Negative Declaration reflect the independent judgment of the City Council;

WHEREAS, based on the staff analysis, oral and written testimony, and the negative declaration, the City Council finds, after due study, deliberation and public hearing and based on its independent judgement that the following:

1. The 2005 *Development Impact Fee Justification Study* and recommended fees are consistent with Government Code Section 66000 et seq and the goals, policies and standards of the Patterson General Plan and all other applicable standards and ordinances of the City of Patterson.
2. The revised fees are necessary to promote the health, safety, comfort, convenience and welfare of Patterson residents by helping to ensure infrastructure and facilities necessary to serve such development are provided concurrently or in advance of such development;
3. The recommended fees will not be detrimental to the health, safety, comfort, convenience, and general welfare.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Patterson as follows:

1. The City Council hereby adopts the Negative Declaration shown in Exhibit "A".
2. The City Council hereby adopts the 2005 Development Impact Fee Justification Study as shown in Exhibit "B" and the revised impact fees as shown in Exhibit "C" ..

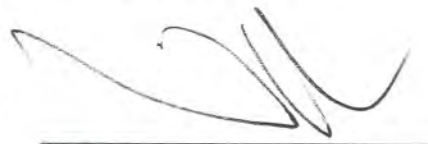
The foregoing resolution was introduced at a regular meeting of the City Council of the City of Patterson, held on the 7th day of March, 2006, by Councilmember Brown, who moved its adoption, which motion was duly seconded by Councilmember Gray and it was upon roll call carried and the resolution adopted by the following vote:

AYES: Councilmembers Gray, Brown, Campo, Cuellar and Mayor Keller

NOES: None


EXCUSED: None

APPROVED:



David Keller
Mayor, City of Patterson

ATTEST:



Maricela L. Vela
City Clerk, City of Patterson

I hereby certify that the foregoing is a full, correct and true copy of a resolution passed by the City Council of the City of Patterson, a Municipal Corporation of the County of Stanislaus, State of California, at a regular meeting held on the 7th day of March 2006, and I further certify that said resolution is in full force and effect and has never been rescinded or modified.

DATED: **July 12, 2006**



City Clerk of the City of Patterson
Maricela Vela