FINAL
PLAINS EXPLORATION AND PRODUCTION
PHASE IV DEVELOPMENT PLAN
ENVIRONMENTAL IMPACT REPORT

Lead Agency:
County of San Luis Obispo
Department of Planning and Building

Environmental Consultant:
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September 2004

padre associates, inc.
ENGINEERS, GEOLOGISTS & ENVIRONMENTAL SCIENTISTS

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CHAPTER 1.0
INTRODUCTION

1.1 BACKGROUND

This is a project Environmental Impact Report (EIR) for the proposed Plains Exploration and Production Phase IV Development Plan.

1.1.1 Project Location

The Phase IV Development Plan project is located in Price Canyon approximately 3 miles northeast of the City of Pismo Beach in San Luis Obispo County, California. The proposed project is in the Arroyo Grande oil field. The project site is located east and west of Price Canyon Road near its intersection with Ormonde Road, midway between Highway 101 and Highway 227. Figures 3.1 and 3.2 are location and vicinity maps of the proposed project site. The proposed project would take place within the Phase IV Development Area, as shown in Figure 3.4.

1.1.2 Project Components

The project involves two phases: (1) Construction, and (2) Operations. The primary components of the proposed project are construction of 95 producer wells, 30 injector wells, modification of 31 existing well pads and construction of 4 new well pads, and construction of 3 steam generators. Existing facilities, such as water and utility gas lines, would be utilized to the greatest extent feasible; however, some ancillary facilities would be constructed. Such facilities may include flowlines, which would be installed above ground in groups along roads.

1.2 TYPE OF ENVIRONMENTAL IMPACT REPORT (EIR)

Guidance for preparing project-specific EIRs is contained under Section 15161 of the Guidelines for Implementation of the California Environmental Quality Act (CEQA Guidelines). Section 15161 clarifies the scope and content of a Project EIR. In summary, a project EIR examines the environmental impacts of a specific development project by focusing on the changes in the environment that would result from implementation of the project. The project EIR should examine all phases of the project, including planning, construction, and operations (CEQA Guidelines, Section 15161, 1999).

1.3 USES OF THE EIR

In accordance with Section 15121 of the *State of California Environmental Quality Act (CEQA) Guidelines (State CEQA Guidelines)*, the purpose of this Environmental Impact Report (EIR) is to serve as an informational document that:

> "…will inform public agencies, decision-makers and the public generally of significant environmental effects of the project, identify ways to minimize significant effects, and describe reasonable alternatives to the project…"

It has been prepared consistent with CEQA, which has the following main objectives:

- To disclose to decision makers and the public the significant environmental effects of proposed activities;
- To identify ways to avoid or reduce environmental damage;
- T prevent environmental damage by requiring implementation of feasible alternatives or mitigation measures;
- To disclose to the public reasons for agency approval of projects with significant environmental effects;
- To foster interagency coordination in the review of projects; and,
- To enhance public participation in the planning process.

This EIR addresses potential impacts that would logically and foreseeably occur from project implementation. The basis for the environmental impact analysis in this EIR is the project description as presented in Chapter 3. The CEQA Guidelines Section 15146 states that the degree of specificity required in the analysis depends on the specificity of the underlying activity described in the EIR. This EIR is based on a project-specific analysis for the Phase IV Development Plan Project. Where significant impacts are identified, project-specific mitigation measures will be developed to reduce impacts to less than significant levels. If project-specific mitigation measures cannot reduce the level of impacts to less than significant, the impact will remain significant and unavoidable.

1.4 ENVIRONMENTAL PROCEDURES

This EIR has been prepared in accordance with the California Environmental Quality Act of 1970 (CEQA), as amended (Public Resources Code, Section 21000, et seq.) and the Guidelines for Implementation of CEQA as amended (California Administrative Code Section 15000, et seq.). This project EIR complies with the rules, regulations, and procedures for implementation of the CEQA.

1.4.1 Notice of Preparation

A Notice of Preparation (NOP) was prepared for the proposed project and distributed to the Distribution List included in Appendix A. The NOP (State Clearinghouse No. 2003091009) was released on September 2, 2003, and was circulated to interested agencies, groups, and individuals for a 30-day review period, which concluded on October 3, 2003. Responses received on the NOP are included in Appendix B.

1.4.2 Public Draft EIR

The EIR will initially be published as a Draft EIR and will be subject to review and comment by the public as well as responsible agencies and other interested organizations during the 45-day review period.

1.4.3 Final EIR

Following public review and comment on the Draft EIR, written responses to comments on the Draft EIR will be prepared. The responses to comments may specify changes to the Draft EIR. The responses to comments, and any changes to the Draft EIR therein specified, will become the Final EIR. The Final EIR will be presented to the San Luis Obsipo County Planning Commission for certification as to its adequacy under CEQA.

1.4.4 Mitigation Monitoring Program

In accordance with CEQA (Section 21081.6), when changes have been incorporated into a project that avoid significant environmental effects or reduce them to a level of insignificance, the lead agency must adopt a Mitigation Monitoring Program (MMP) to ensure compliance during implementation.

The MMP for the proposed project will be prepared for presentation to the Planning Commission along with the Final EIR. The MMP will include all adopted mitigation measures and will describe how the mitigation measures will be implemented and monitored,

The County shall be responsible for recording and tracking implementation of the MMP. The County record shall include:

- Personnel responsible for monitoring mitigation measures;
- Verification and schedule of compliance; and,
- A record of any remedial action taken for non-compliance with the MMP.

1.5 ORGANIZATION OF THE EIR

This document provides an array of environmental information in different levels of detail depending upon the scope of potential impacts to each issue area. The document is structured in a manner to allow the reader to easily track information from the Summary (Chapter 2) through the Project Description (Chapter 3) and the Impact Analyses (Chapter 6). Impacts are numbered consecutively, and where appropriate, are associated with a mitigation measure that is correspondingly numbered. This numbering system is carried over into the summary to allow easy location of the document's discussion regarding a particular impact.

This EIR includes a project-specific level of analysis for the proposed project. Chapters in the EIR include general information, such as the environmental setting and relevant regulatory considerations for each environmental resource area as related to the proposed project, and proposed project impacts, which includes a discussion of the impacts and mitigation measures specific to the proposed project.

The document is organized to be read in several ways depending upon the reader's available time or interest in a particular issue area. The briefest approach to the document involves reading only the project summary (chapter 2), which contains general information about the project, potential impacts, and mitigation measures. A somewhat more detailed review of the document might involve careful reading of the full project description (Chapter 3) and description of the alternatives (Chapter 6), as well as the summary. For those with an interest in a

particular issue area, it may be appropriate to review a specific chapter or set of chapters based on the reader's interest in a particular environmental resources area (e.g., air quality, noise, etc.). Finally, one can read the entire document for a detailed presentation of all potential environmental effects of the project as proposed, and alternatives to the project.

The CEQA Guidelines require that each EIR contain areas of description and analysis. The following list identifies areas of particular interest and the corresponding chapters in this EIR:

1.0 Introduction

The introduction section discusses procedural matters, document format and organization, and project sponsors and contact persons.

2.0 Summary

The Summary (Section 15123 of the CEQA Guidelines) includes: an Executive Summary of the EIR; and a summary table listing significant impacts of the proposed project, any recommended mitigation measures, and the effect of the mitigation measures.

3.0 Project Description

The Project Description (Section 15124 of the CEQA Guidelines) includes a description of the project location and vicinity. It also identifies the applicant's objective, project characteristics, and required discretionary actions.

4.0 Land Use Policy Consistency

This Chapter provides information on the community setting and reviews the General Plan, applicable community plans and land use ordinances, and assesses the consistency of the proposed project with these adopted plans, policies, and ordinances. This chapter also examines the compatibility of the proposed project with existing land uses in the project vicinity.

5.0 Environmental Impact Analysis

This chapter is the substantive portion of the EIR and contains the full environmental analysis as required under Sections 15126 and 15143 of the CEQA Guidelines. This chapter achieves the following:

- Identifies significant environmental impacts of the proposed project and alternatives, including thresholds for significance; both project-specific and cumulative impacts by issue area will be identified and assessed;
- Discloses any significant environmental effects of the proposed project and alternatives, which cannot be avoided if the proposal is implemented; and,
- Develops mitigation measures to avoid or minimize the significant effects. Mitigation measures are reasonably expected to reduce significant adverse impacts of development to a less-than-significant level. Where no mitigation measures are available to reduce an impact to less-than-significant, the impact is termed significant and unavoidable. Mitigation measures will be incorporated into a monitoring program.

Where feasible, County-approved thresholds of significance are used to aid in determining the significance of environmental effects. A threshold of significance is an identifiable quantitative, qualitative, or performance level of a particular environmental effect. Noncompliance with this performance level is considered a significant impact and compliance is considered less than significant. Guidelines sec. 15064.7.

Where there are multiple thresholds of significance for a given issue area, than specific thresholds associated with an impact are identified.

6.0 Alternatives

The Alternatives section examines a variety of suggested project alternatives as well as options currently under consideration or which may conceivably reduce the project's environmental impacts. The alternatives include a "no project" alternative in order to allow decision-makers to compare the effects of not approving a project or alternative. The purpose of this section is to provide decision-makers with a summary assessment of the comparative effects of each of the alternatives, focusing on the significant, unavoidable impacts, both short and long-term, and on mitigation measures for such impacts. The CEQA Guidelines (Section 15126) require that a reasonable range of alternatives to the proposed project be discussed in the EIR and state that "the discussion of alternatives should focus on those alternatives capable of eliminating significant physical environmental effects or reducing them to a level of insignificance, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly."

7.0 Growth Inducing and Irreversible Commitments

This section describes the Growth Inducing Impacts and Irreversible Environmental Changes associated with the project.

8.0 Cumulative Analyses

This section describes the cumulative effects of project impacts considered in the context of other approved or reasonably anticipated projects in the area.

1.6 FOCUS OF THE EIR ANALYSIS AND ISSUES TO BE STUDIED AND RESOLVED

Preliminary review of the proposed project and discussions with the County of San Luis Obispo determined that the EIR should be focused on the following issue areas:

- Land Use
- Traffic
- Aesthetics
- Air Quality
- Biological Resources
- Cultural Resources
- Geology and Soils
- Paleontological Resources
- Noise
- Hazards/Risk of Upset

The following issue areas were analyzed and determined to have less than significant impacts with project implementation:

- Agricultural Resources
- Population
- Housing
- Public Services
- Energy
- Utilities
- Human Health
- Recreation

1.7 LEAD, RESPONSIBLE, AND INTERESTED AGENCIES

1.7.1 Lead Agency

The County of San Luis Obispo is the lead agency for the project in accordance with Sections 15050 and 15367 of the State CEQA Guidelines. The lead agency is defined as the public agency, which has the principal responsibility for carrying out or disapproving a project." The lead environmental consultant for the lead agency is Padre Associates, Inc. (Padre).

1.7.2 Responsible/Trustee Agencies

Section 15381 of the State CEQA Guidelines defines a Responsible Agency as a "public agency, which proposes to carry out or approve a project for which a Lead Agency is preparing or has prepared an EIR or Negative Declaration." For the purposes of the CEQA, the term "Responsible Agency" includes all public agencies other than the lead agency, which have a discretionary approval power over the project. The responsible agency must notify the lead agency during the NOP period as to the scope and content of the environmental information related to the responsible agency's area of statutory responsibility that must be included in the draft EIR (CEQA Section 15082(b). Trustee Agencies are listed in the State CEQA Guidelines Section 15386 and defined as a Stat agency having jurisdiction by law over natural resources affected by a project which are held in trust for the people of California.

The County of San Luis Obispo is the lead agency for this project. The following agencies could be expected to use this document for future permits or other approvals for the project:

- County of San Luis Obsipo – Conditional Use Permit approval;
- Division of Oil, Gas, and Geothermal Resources – Well Permit;
- Regional Water Quality Control Board – Section 401 Water Quality Certification (possible);
- San Luis Obispo Air Pollution Control District – Authority to Construct/Operate;
- California Department of Fish and Game – Streambed Alteration Agreement (possible); and,
- CDF/San Luis Obispo County Fire Department – Fire Protection
- U.S. Army Corps of Engineers – Section 404 permit (possible).

1.8 PROJECT SPONSOR AND CONTACTS

The project applicant is Plains Exploration and Production (PXP). Contacts for this EIR are:

County of San Luis Obispo	Mr. Steve McMasters, EIR Project Manager San Luis Obispo County, Department of Planning and Building County Government Center, Room 310 San Luis Obispo, CA 93408-2040
Plains Exploration and Production	Kurt Koerner, Central California Asset Manager Plains Exploration and Production 1821 Price Canyon Rd. San Luis Obispo, CA 93401
EIR Consultant:	Simon Poulter, Principal – in – Charge Padre Associates, Inc. 1012 Pacific Street, Suite A San Luis Obispo, CA 93401

CHAPTER 2.0
SUMMARY OF ENVIRONMENTAL EFFECTS

2.1 PROPOSED PROJECT

Plains Exploration and Production (PXP) is proposing to expand existing oil production operations at the Arroyo Grande oil field consistent with an overall master plan, which identified the project area as an extractive resource area and outlined long-term operations and goals for the oil field. The objective of the Phase IV Development Plan Project is to increase the amount of marketable gravity crude oil produced using a thermal (steam injection) process. Currently, approximately 1,800-1,900 barrels per day (BOPD) (657,000-693,500 barrels per year) are produced. The Phase IV project is anticipated to increase field production levels to 5,000 BOPD, or 1,825,000 barrels annually. Because of potential impacts to a number of resources, the County determined that an Environmental Impact Report (EIR) is warranted. This EIR has been prepared for the Phase IV Development Plan Project.

The Arroyo Grande oil field is located in Price Canyon about 3 miles northeast of Pismo Beach, in San Luis Obispo County, California. The proposed Phase IV project ~~is~~ lies entirely within the 264-acre Phase III boundary ~~defined~~ previously reviewed in the 1994 Shell Western Development Plan EIR (1994 EIR), certified by the County of San Luis Obispo in 1994. This site lies primarily within the 320-acre Arroyo Grande field area, which is within the larger Price Canyon Unit (approximately 1,480 acres).

The project would consist of two phases: (1) Construction Phase, and (2) Operational Phase. Construction would include 95 new production wells and 30 steam injection wells (which are needed to enhance recovery of the heavy crude oil found at the site). All of the wells will occur within the 264-acre Phase III boundary. The Phase IV drilling program will require utilization of 31 existing pads and development well areas and grading of four new pads. Approximately 45% (14 pads) of the existing pads will require no additional ground disturbance and the remaining existing pads will require from minimal to moderate grading. The new pads that are required would be accessible from the existing roads; therefore, no new roads are proposed. In total, about seven previously undisturbed acres will be disturbed, to varying degrees, by this expansion. In addition, the project would include the construction of three steam generators originally approved during the Phase III expansion, but never constructed.

2.2 AREAS OF CONTROVERSY

Section 15132 of the CEQA Guidelines requires the summary section of an EIR to include "Areas of Controversy known to the Lead Agency." Areas of Controversy identified during preparation of the Draft EIR include:

1) Potential impacts on biological resources, particularly special-status species;
2) Construction of the project will generate noise that will affect neighboring residential areas; and,

3) Construction will generate emissions that contribute to local air quality degradation.

2.3 ISSUES TO BE RESOLVED

Section 15132 of the CEQA Guidelines requires the summary section of an EIR to identify any "issues to be resolved including the choice among alternatives and how to mitigate significant effects." Summary of the alternative evaluation is presented below.

2.4 SUMMARY OF ALTERNATIVES ANALYSIS

CEQA does not require that the alternatives analysis evaluate modification of internal components or phases of a proposal. However, the County formulated a number of alternatives that would meet objectives of the project, while minimizing impacts to area resources. Four alternatives are examined in this EIR:

Alternative 1: No Project Alternative

Alternative 2: Reduced Project Alternative

Alternative 3: Reduced Disturbance Alternative

Alternative 4: Alternative Energy Source Alternative

Alternative 5: Fully Mitigated Project Alternative

These alternatives were formulated by the County to provide a reasonable range of scenarios that could reduce the level of impact from that anticipated with implementation of the proposed project. Each of these alternatives is described in greater detail in Section 6, the Alternatives Analysis.

Alternative 1 (No Project) would have no construction or operational impacts, but would not allow expansion of oil production at the Arroyo Grande Oil field. Alternatives 2 and 3 also would allow some expansion of oil production, but would impact resources at the project. Alternative 2 would allow construction of the proposed new well pads and modification to the existing ones, but would be limited to construction of only 45 production wells, 10 injection wells, and only 1 steam generator. Alternative 3 would involve the construction of the 95 production wells, 30 injection wells, and 3 steam generators, but no new well pads would be constructed. These features would be established on existing pads only. Alternative 4 would entail development of an alternate energy source in lieu of expansion of PXP's existing operations. Alternative 5 would involve construction of the 95 production wells, 30 injection wells, grading of the four new pads, modification to the existing ones, and construction of the three new steam generators; however, this alternative would include all of the mitigated prescribed in Chapter 5.0 to reduce all impacts to a level of less-than-significant. As such, this alternative would be the environmental superior alternative. It also would meet the objectives of the proposed project, as described in Section 3.3.

2.5 MITIGATION MONITORING PLAN

Section 21081.6 of the Public Resources Code requires the adoption of a "reporting or monitoring plan" for the changes to the project, which the agency has adopted, or for the mitigation measures adopted as conditions of approval. The Mitigation Monitoring Plan will be prepared in conjunction with the Final EIR.

2.6 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Table 2-1 provides a summary of the level of significance for each impact discussed in this EIR. Project level impacts are categorized as Significant and Unavoidable (1), Significant and Avoidable (2), Less than Significant (3), and Beneficial (4). In addition, instances where project level impacts would contribute to a cumulative regional impact are identified as Significant Cumulative (SC).

Significant Unavoidable (Class 1) impacts are those impacts that would be significant at the project level. The project may propose mitigation, or recommended measures may be identified in the EIR, but despite the implementation of such measures, the impact is suggested to be significant and unavoidable. Mitigation has not been identified that could reduce these impacts to a less than significant level and still achieve the project objectives.

Significant Avoidable (Class 2) impacts are those impacts that would be significant if allowed to occur as proposed. However, mitigation measures have been recommended that would reduce these impacts to less than significant if implemented. Recommended mitigation measures are not considered part of the project, and consequently the level of impact reflects the significance without implementation of the Recommended Measure(s).

Less than Significant (Class 3) impacts are those impacts that would be less than significant without mitigation or less than significant after the application of Proposed Mitigation. Proposed mitigation includes measures that have been incorporated into project design or that the applicant has agreed to implement as part of the project.

Beneficial Impacts (Class 4) would result in net positive affects to a given resource category.

Table 2-1 provides a comprehensive summary of the impacts and mitigation measures presented in this EIR.

TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES
PXP PHASE IV DEVELOMENT PLAN PROJECT

Impact		Impact Category Before Mitigation	Mitigation Measures	Impact Category After Mitigation	Cumulative Impact
4.0	Land Use Policy Consistency				
LND-1	Physically divide an established community.	3	No mitigation is required.	3	3
LND-2	Compatibility with San Luis Obispo County Land Use Categories	3	No mitigation is required.	3	3
LND-3	Consistency with the County of San Luis Obispo General Plan Land Use Element, San Luis Bay Inland Area Plan.	2	As a condition of project approval, PXP shall, prior to construction, submit to the County for approval a plan to preserve the long-term productivity of, and to eventually restore, the site after oil extraction operations are completed. This shall include provisions to ensure eradication of exotic plant species (i.e., pampus grass, tree tobacco, etc.) within the dedicated easement and for controlling the spread of exotic species throughout the Phase IV expansion area.	3	3
LND-4	Consistency with the County of San Luis Obispo Land Use Ordinance	3	No mitigation is required.	3	3
LND-5	Consistency with the County of San Luis Obispo Energy Element	3	No mitigation is required.	3	3
LND-6	Consistency with the County of San Luis Obispo Agriculture and Open Space Element	3	No mitigation is required.	3	3
5.2	Traffic and Circulation				
TRA-1	Construction-related traffic may reduce the LOS along Price Canyon Road.	3	No mitigation is required.	3	3

IMPACT CATEGORIES

1	Significant and Unavoidable	3	Less Than Significant
2	Significant and Avoidable (mitigable)	4	Beneficial

TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES
PXP PHASE IV DEVELOMENT PLAN PROJECT

	Impact	Impact Category Before Mitigation	Mitigation Measures	Impact Category After Mitigation	Cumulative Impact
TRA-2	Entering and exiting of the trucks may reduce traffic safety on Price Canyon Road during the A.M. and P.M. peak hour.	2	Trucks (delivery, hauling and transportation trucks) should be scheduled outside the A.M. and P.M. peak period (7:00 to 9:00 A.M. and 4:00 to 6:00 P.M. to the extent feasible (no increase in truck trips will occur during the A.M. and P.M. peak periods). Construction related traffic shall use on-site roads wherever possible. Warning signs should be placed on Price Canyon Road prior to construction to notify through traffic of trucks entering and exiting the site.	3	3
5.3	Aesthetics				
AES-1	Construction of the proposed project may result in visual impacts to motorists traveling along Price Canyon Road, nearby residences, and passengers on Amtrak passenger trains traveling along the Union Pacific Railroad tracks through Price Canyon.	3	No mitigation is required.	3	3
AES-2	Project construction will require removal of ~~several~~ up to 46 mature coast live oaks and several Well's manzanita, which may reduce the visual quality of the project area.	2	Section 5.5 Biological Resources includes measures that will minimize any visual impacts	3	3
AES-3	The new steam generators would be partially visible from Price Canyon Road	3	No mitigation is required.	3	3

IMPACT CATEGORIES

1	Significant and Unavoidable	3	Less Than Significant
2	Significant and Avoidable (mitigable)	4	Beneficial

TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES
PXP PHASE IV DEVELOMENT PLAN PROJECT

	Impact	Impact Category Before Mitigation	Mitigation Measures	Impact Category After Mitigation	Cumulative Impact
AES-4	Wells drilled on new pads would increase the number of wells visible on the property.	4	Following drilling and construction of the well pumper units, the applicant will be required to plant native vegetation to shield/screen the new wells from motorists traveling along Price Canyon Road. Details of such planting will be specified in the revegetation plan, which the applicant will be required to prepare prior to issuance of the Conditional Use Permit by the County (See Section 5.5 – Biological Resources). The well pumper units will be painted with a flat green non-reflective paint that blends with the surrounding landscape of the project site.	3	3
5.4	Air Quality				
AQ-1	Construction activity would generate air emissions that may adversely impact local and regional air quality.	2	A. Equipment Emission Control Measures. ~~Drilling equipment emissions shall be reduced through the installation of a NOx reducing catalyst/catalyzed diesel particulate filter system (cleaire Longview, or equivalent) on the draw works, mud pump and generator engines. This system uses diesel fuel as a reducing agent, where it is drawn from the engine fuel supply, pressurized, filtered and injected into the exhaust pipe where it reacts with the NOx reducing catalyst. The catalyzed diesel particulate filter eliminates any unreacted diesel fuel. The Longview system is ARB verified for on road use and is easily installed on stationary industrial engines such as the draw works engine. This measure would~~	3	3

IMPACT CATEGORIES

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TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES
PXP PHASE IV DEVELOMENT PLAN PROJECT

Impact	Impact Category Before Mitigation	Mitigation Measures	Impact Category After Mitigation	Cumulative Impact
		~~reduce NOx and ROG emissions by about 16 and 50 percent, respectively (assumes 25 percent NOx and 65 percent ROG emissions reduction of catalyst equipped engines).~~ Prior to construction, ~~A~~a Drilling Emissions Reduction and Monitoring Plan shall be developed, approved by the County and fully implemented. The Plan shall specify the emissions control measures to be implemented on each emission source, the expected reduction for each criteria pollutant, the period the emissions control measures are to be in place, and a quarterly summary of the emissions reductions. The summary shall include sufficient information for the APCD to verify the emissions reductions have occurred. Potential emission reduction measures may include: • Use of well pad construction and drilling scenarios to reduce peak emissions; • Use of engines meeting the Tier 1 or 2 Federal emissions standards for non-road applications; • Installation of diesel oxidation catalysts (up to 25 percent NOx reduction); • Installation of diesel reduction catalyst/catalyzed diesel particulate filter system (25 percent NOx reduction); • Use of PuriNOx fuel by Lubrizol (14		

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PXP PHASE IV DEVELOMENT PLAN PROJECT

Impact	Impact Category Before Mitigation	Mitigation Measures	Impact Category After Mitigation	Cumulative Impact
		percent NOx reduction); • Use of Aquazole fuel (14 percent NOx reduction); and • Use of water-emulsified diesel fuel by Clean Fuels Technology (15 percent NOx reduction). B. Dust Control Measures. Dust generated by construction activities shall be kept to a minimum by full implementation of the following measures. • During clearing, grading, earth moving, excavation, or transportation of cut or fill materials, water trucks or sprinkler systems shall be used to prevent dust from leaving the site and to create a crust after each day's activities cease; • During construction, water trucks or sprinkler systems shall be used to keep all areas of vehicle movement damp enough to prevent dust from leaving the site. At a minimum, this would include wetting down such areas in the morning and after work is completed for the day and whenever wind exceeds 15 miles per hour; • Stockpiled earth material shall be sprayed as needed to minimize dust		

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Impact		Impact Category Before Mitigation	Mitigation Measures	Impact Category After Mitigation	Cumulative Impact
			generation. • During construction, the amount of disturbed area shall be minimized, and onsite vehicle speeds should be reduced to 15 mph or less; • Exposed ground areas that are planned to be reworked at dates more than one month after initial grading should be sown with a fast-germinating native grass seed and watered until vegetation is established; • After clearing, grading, earth moving, or excavation is completed, the entire area of disturbed soil shall be treated immediately by watering or revegetating or spreading soil binders to minimize dust generation until the area is paved or otherwise compacted so that dust generation is minimized; • Grading and scraping operations shall be suspended when wind speeds exceed 20 mph (one hour average); • Rumble pads (minor road obstructions designed to dislodge accumulated earth material from trucks) with spray washers shall be installed and maintained at all construction entrances; and		

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Impact		Impact Category Before Mitigation	Mitigation Measures	Impact Category After Mitigation	Cumulative Impact
			• All roadways associated with construction activities should be paved as ~~soon~~ efficiently as possible. ○ Emission Offsets. Project emissions remaining following implementation of the above mitigation measures shall be offset through contribution to an off-site mitigation fund. The fund is managed by the APCD and used to finance regional emission reduction projects such as bikeways, vehicle scrapping programs, diesel bus conversions, agricultural engine replacements and similar activities. Therefore, project emissions would be offset on a regional basis through applicant-funded off-site projects that would result in emissions reductions. Based on past experience the APCD has determined that $8,500 is required per ton NOx reduced. These funds would be used by the APCD to purchase clean-burning engines and other equipment/facilities that would result in a decrease in emissions in the County. The financial contribution would be paid on a per well basis, based on the number of wells to be drilled during a known period. The dollar amount shall be based on offsetting excess emissions (greater than 2.5 tons NOx per quarter) at $8,500 per ton.		
AQ-2	Diesel fuel combustion associated with project	3	No mitigation is required.	3	3

IMPACT CATEGORIES

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Impact		Impact Category Before Mitigation	Mitigation Measures	Impact Category After Mitigation	Cumulative Impact
	construction activity would generate emissions of toxic air contaminants.				
AQ-3	Fugitive dust generated by construction activity may contain asbestos and result in exposure of the public to this toxic air contaminant.	3	No mitigation is required.	3	3
AQ-~~4~~2	Operation of the proposed oil production facilities would result in NOx and ROG emissions from steam generators that may adversely affect local and regional air quality	2	A. The proposed steam generators would be lo-NOx designs and comply with APCD Rule 430. No further emission controls are considered feasible. However, emissions can be offset through the contribution to an off-site mitigation fund to finance regional emission reduction projects such as bikeways, diesel bus conversions, agricultural engine replacements and similar activities. B. Alternatively, the project proponent may elect to reduce emissions from existing steam generators and other fuel burning equipment such as heater treaters, tank heaters and glycol reboilers. Emissions may be reduced through the retrofit of existing burners with lo-NOx designs. Emissions could be reduced to a level of less than significant through a combination of these measures.	3	3

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PXP PHASE IV DEVELOMENT PLAN PROJECT

Impact		Impact Category Before Mitigation	Mitigation Measures	Impact Category After Mitigation	Cumulative Impact
AQ-~~5~~3	Operation of the proposed oil production facilities would result in fugitive emissions from valves, flanges and other components associated with well production.	2	The applicant is fully implementing the requirements of Rule 417, ~~The proposed project shall fully implement the provisions of APCD Rule 417,~~ which requires quarterly monitoring for leaks, and repair of leaks completed with 14 days for minor gas leaks, 5 days for major gas leaks and 2 days for liquid leaks. Based on Table 5-3 of Protocol for Equipment Leak Emission Estimates (EPA, 1995b) it was assumed than full implementation of the requirements of Rule 417 would result in at least a 61 percent reduction in fugitive hydrocarbons. ~~Therefore, the controlled fugitive ROG emission rate for the proposed facilities would be 160.8 pounds per day.~~ Project ROG emissions could be reduced further as discussed above under Mitigation Measure AQ-~~4~~2.	3	3
AQ-~~6~~4	Toxic air contaminants contained with steam generator exhaust and fugitive hydrocarbon emissions may result in unacceptable human health risk.	2	As part of permitting for the proposed steam generators (New Source Review), the APCD would require the project proponent to complete a comprehensive facility-wide health risk assessment (HRA) according to the Emission Inventory Criteria and Guidelines for the "Hot Spots" program. The Assessment would include a facility-wide inventory of toxic air contaminants (including sulfur compounds), air dispersion modeling to determine ground-level concentrations at adjacent residences and application of unit risk factors to identify cancer and non-cancer health risk. Should the results of the health risk assessment indicate unacceptable health risk, mitigation measures may be required to reduce health risk by reducing ground-level concentrations of toxic air contaminants, such as: 1. Limiting simultaneous operation of	3	

IMPACT CATEGORIES

1	Significant and Unavoidable	3	Less Than Significant
2	Significant and Avoidable (mitigable)	4	Beneficial

TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES
PXP PHASE IV DEVELOMENT PLAN PROJECT

Impact		Impact Category Before Mitigation	Mitigation Measures	Impact Category After Mitigation	Cumulative Impact
			steam generators; and 2. Limiting use of landfill gas as fuel. ~~•Increasing exhaust stack height of the steam generators to increase dispersion;~~		
AQ-7	The impact of odors from the expansion of the oil production is an air quality issue.	3	While no mitigation is required, an Odor Monitoring and Complaint Response Plan may be developed, approved by the APCD and fully implemented. The Plan may include the following elements: • Screening program of employees for olfactory acuity to identify odor monitors, using a series butanol/water solutions; • Training program for odor monitors to recognize odors and identify problem areas (unusually strong odors); • Protocol to investigate odors identified by employees, including enhanced fugitive hydrocarbon monitoring and follow-up olfactory monitoring; • Procedures to reduce identified odors through equipment maintenance, equipment replacement, operating procedures or specific odor controls; • Procedures to respond to odor complaints including responsible employees, collection of process data, meteorological data, olfactory monitoring data, data analysis and reporting back	3	3

IMPACT CATEGORIES

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TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES
PXP PHASE IV DEVELOMENT PLAN PROJECT

Impact	Impact Category Before Mitigation	Mitigation Measures	Impact Category After Mitigation	Cumulative Impact
		to the APCD; and • Contingency measures to address chronic odor complaints which may include collection of samples for laboratory analysis or dilution-to-threshold equipment (Scentometer, or equivalent) to quantify odors and more precisely identify sources. • Utilization of monitoring equipment.		
5.5	Biological Resources			
BIO-1	Construction activities could result in the disturbance of wildlife occupying adjacent habitats.	3	No mitigation required.	3	3
BIO-2	Construction activities could adversely affect nesting activities of protected migratory birds.	2	Construction and drilling operations shall be conducted prior to the initiation of nesting, or after the completion of nesting to avoid any potential impact to migratory birds. Specifically, the following measures should be implemented: A. Well pad grading operations shall be conducted prior to the initiation of nesting, or after the completion of nesting to avoid any potential impact to migratory birds. Therefore, clearing and grading of well pads, and all drilling operations should be conducted between the months of August and March. B. If Measure A is infeasible, pre-construction surveys	3	3

IMPACT CATEGORIES

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TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES
PXP PHASE IV DEVELOMENT PLAN PROJECT

Impact	Impact Category Before Mitigation	Mitigation Measures	Impact Category After Mitigation	Cumulative Impact
		shall be conducted between February 15 and August 15 to identify potential bird and raptor nesting sites: ▪ If active nest sites of common bird species protected under the Migratory Bird Treaty Act (e.g., northern mockingbird, house finch, etc.) are observed within the vicinity of the project site, then the project shall be modified and/or delayed as necessary to avoid direct take of the identified nests, eggs, and/or young; and, ▪ If active nest sites of raptors and/or species of special concern (e.g., northern harrier, horned lark, etc.) are observed within the vicinity of the project site, then CDFG shall be contacted to establish the appropriate buffer around the nest site. Construction activities in the buffer zone shall be prohibited until the young have fledged the nest.		
BIO-3	Construction activities could adversely affect special-status plant and animal species potentially occurring in the project area.	2,3	The following mitigation measures are recommended to avoid and/or minimize impacts to special-status species known to occur or with the potential to occur within the existing and newly proposed well pads during construction. This includes protective measures to avoid and/or minimize impacts to Well's Manzanita during the construction phase of the project: <u>General Measures</u>: A. All equipment staging areas, construction-crew	3	3

IMPACT CATEGORIES

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TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES
PXP PHASE IV DEVELOMENT PLAN PROJECT

Impact	Impact Category Before Mitigation	Mitigation Measures	Impact Category After Mitigation	Cumulative Impact
		parking areas, and construction access routes shall be established in previously disturbed or developed; B. Exclusionary fencing will be erected at the boundaries of ~~all~~ construction areas to avoid equipment and human intrusion into adjacent habitats with emphasis on protection of areas containing special-status species. The exact location of exclusionary fencing for each construction area shall be determined by a County-approved biological monitor. The fencing shall remain in place throughout the construction and drilling phase for each individual pad; C. A County-approved biological monitor shall conduct a worker orientation for all construction contractors (site supervisors, equipment operators and laborers) which emphasizes the presence of special-status species within the project site, identification, their habitat requirements, and applicable regulatory policies and provisions regarding their protection, and measures being implemented to avoid and/or minimize impacts; D. During nighttime drilling and/or construction activities, all equipment lighting (i.e., drilling rigs, etc.) shall be shielded away from adjacent wildlife habitat areas and sky to minimize lighting/glare impacts of wildlife; and,		

IMPACT CATEGORIES

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TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES
PXP PHASE IV DEVELOMENT PLAN PROJECT

Impact	Impact Category Before Mitigation	Mitigation Measures	Impact Category After Mitigation	Cumulative Impact
		E. Mitigation Measure AQ-1 (a dust control program during the construction phase of the project shall be implemented to minimize dust impacts to adjacent vegetative communities and special-status plant species). <u>Protective Measures for Special-Status Plants:</u> F. Due to the fluctuation in annual plant populations, Spring botanical surveys shall be conducted annually by a County-approved biologist to update the location of special-status plant species populations on project plans until the end of the construction period (as illustrated on Figure 5.5-2). Annual botanical survey results and documented fluctuations in populations shall be added cumulatively to project plans each year (i.e., all newly discovered populations shall be added to existing populations documented in previous years). All mapped populations shall be clearly fenced off with exclusionary fencing prior to construction in those areas. If areas supporting Pismo Clarkia and/or other sensitive plant species are determined by the County to be <u>unavoidable</u> then seed shall be collected from selected plants in impact areas and utilized to restore habitat in a pre-designated restoration site; G. To avoid the removal of an estimated 163 Well's manzanitas, newly proposed well pad Signal 66C		

IMPACT CATEGORIES

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TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES
PXP PHASE IV DEVELOMENT PLAN PROJECT

Impact	Impact Category Before Mitigation	Mitigation Measures	Impact Category After Mitigation	Cumulative Impact
		shall be realigned and reduced in size to allow installation of the two wells within existing pre-disturbed areas (i.e., existing roadways and well pad areas). Specifically, Signal 66C shall be realigned westward toward an existing access roadway and well pad Signal 147 to avoid a dense stand of Well's manzanita; and, H. Utilizing the manzanita survey data collected in 2003, final project plans shall clearly illustrate the location of Well's manzanita to be removed as part of the project and all manzanita to remain within 25 feet of construction activities. Prior to any construction, grubbing or tree removal, each manzanita within the vicinity of the subject pads shall be clearly marked for removal or protection. <u>Protective Measures for Special-Status Wildlife</u>: I. A County-approved biologist shall conduct pre-construction surveys to determine presence/absence of California horned lizard within and adjacent to individual well pads containing suitable chaparral and/or scrub habitat. Surveys shall only be required during the active period of California horned lizards (generally April through September). If California horned lizards are identified adjacent to and/or within work areas, then hand rakes or an equivalent shall be utilized by biological monitors to scarify the ground surface and encourage the horned lizards (and other		

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SUMMARY OF IMPACTS AND MITIGATION MEASURES
PXP PHASE IV DEVELOMENT PLAN PROJECT

Impact	Impact Category Before Mitigation	Mitigation Measures	Impact Category After Mitigation	Cumulative Impact
		wildlife) to vacate the immediate area prior to construction. Alternatively, sampling composed of drift fences shall be used to capture horned lizards. As necessary, the County-approved biological monitor shall physically relocate California horned lizard to suitable habitat located outside the construction zone. Exact procedures and protocols for relocation shall be based upon pre-project consultation with CDFG; J. A County-approved biological monitor shall be on-site during all vegetation clearing and shall periodically monitor the project site during construction activities to inspect protective fencing, equipment staging areas, and physically relocate/remove any special-status wildlife species entering the construction zone (i.e., California horned lizard, etc.). All special-status species shall be relocated to suitable habitat located outside the construction zone by a qualified biologist. Exact procedures and protocols for relocation shall be based upon pre-project consultation with CDFG; and, K. Mitigation Measure Bio-2 (nesting bird surveys shall be conducted between February 15 and August 15 to identify nest sites of special-status bird species including American peregrine falcon, horned lark, northern harrier, and Cooper's hawk).		

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SUMMARY OF IMPACTS AND MITIGATION MEASURES
PXP PHASE IV DEVELOMENT PLAN PROJECT

Impact		Impact Category Before Mitigation	Mitigation Measures	Impact Category After Mitigation	Cumulative Impact
BIO-4	Construction activities could result in direct and indirect impacts to special-status species potentially occurring within the nearby Pismo Creek and associated tributaries.	2	The following mitigation measure is recommended to avoid and/or minimize impacts to special-status species known to occur or with the potential to occur within the Pismo Creek watershed: A. ~~A.~~ Construction (e.g., clearing and grubbing of vegetation, rough grading, drilling, etc.) of any previously undisturbed area located within a buffer zone of 100 feet from both sides of Pismo Creek's banks (San Luis Obispo County Land Use Ordinance 22.07.166) shall be prohibited. Pismo Creek and the required 100-foot buffer shall be illustrated on final project plans and adhered to during the construction period; B. Both Morehouse 303 and Signal 151 are within the 100-foot creek setback; a portion of Signal 151 is also within the 100-year floodplain. These two pads already exist and have been previously disturbed, such that annual grassland represents the dominant vegetation cover at these sites. As such, only a 50-foot creek setback from the top of bank will be required at these two pads. However, grading and drilling will be restricted to	3	3

IMPACT CATEGORIES

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SUMMARY OF IMPACTS AND MITIGATION MEASURES
PXP PHASE IV DEVELOMENT PLAN PROJECT

Impact		Impact Category Before Mitigation	Mitigation Measures	Impact Category After Mitigation	Cumulative Impact
			previously disturbed areas and no riparian vegetation will be removed. In addition, because the pads are not located outside of the 100-foot creek buffer zone applied to other pads, drilling and construction will be prohibited on these pads during the nesting bird season. Berming will also be established at these sites to contain migration of miscellaneous drilling materials and will be at a height at least one-foot above the 100-year base flood elevation to prevent secondary, indirect impacts to special-status species that have the potential to occur in adjacent areas(refer also to existing mitigation measures BIO 3 and BIO 4, respectively). A 100-foot setback will be observed for all other pads/construction areas, except well pad Rock 85A. Rock 85A, which is a proposed new pad, is within 100 feet of an unnamed blue-line stream, as shown on a standard 7.5-minute USGS quadrangle map. This blue-line stream is a small intermittent drainage that flows through a culvert underneath Price Canyon Road and connects with Pismo Creek. Because this drainage is currently degraded due to past land use practices and existing sedimentation impacts, construction will be allowed to occur within 50 feet of top of bank with establishment of appropriate		

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TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES
PXP PHASE IV DEVELOMENT PLAN PROJECT

Impact		Impact Category Before Mitigation	Mitigation Measures	Impact Category After Mitigation	Cumulative Impact
			one-foot berming as discussed above. C. The applicant may be allowed to construct within 30 feet of top of bank at Rock 85A if a complete restoration plan for the unnamed blue-line stream is submitted to the County prior to implementation of construction activities at this pad. Restoration shall include provisions for removal of non-native plant species and planting of native, riparian vegetation to enhance the habitat value for special-status species. D. Construction (not including drilling activities) of those previously disturbed areas located within the buffer zone of 100 feet from both sides of Pismo Creek's banks (limited only to Signal 151, Morehouse 303, and Rock 85A) shall be monitored by a qualified biologist on a full-time basis. The biological monitor shall conducted pre-construction surveys for special-status wildlife species, maintain protective fencing, inspect equipment staging areas, and physically relocate/remove any special-status wildlife species entering the construction zone; and,		

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PXP PHASE IV DEVELOMENT PLAN PROJECT

Impact		Impact Category Before Mitigation	Mitigation Measures	Impact Category After Mitigation	Cumulative Impact
			E. Mitigation Measure BIO-3.		
BIO-5	Implementation of the Phase IV Expansion will result in the removal of up to 46 coast live oak trees and an additional 107 oak trees could be impacted by proposed activities.	2	The following mitigation measures are recommended to mitigate impacts to oak trees due to project implementation. This includes protective measures to avoid and/or minimize impacts to oak trees designated for long-term preservation: A. To avoid the removal of an estimated 9 mature oak trees, the applicant shall implement provision A of Mitigation Measure BIO-3 listed above (modification of well pad Signal 66C to avoid tree removal). In addition, the northern corner of Signal 113A shall be realigned southward to avoid four existing mature coast live oak trees. These modifications shall be displayed on final project plans prior to construction; and, B. Prior to construction of the 1st improvement authorized under this approval, a Habitat Enhancement Plan containing site-specific oak tree protection and replacement procedures shall be prepared for the project. The Habitat Enhancement Plan shall clearly outline the procedures for protecting oak trees to remain in place during construction and provide details for replacing oak trees that are removed at a 4:1 ratio and those impacted at a 2:1 ratio. Final	3	3

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PXP PHASE IV DEVELOMENT PLAN PROJECT

Impact		Impact Category Before Mitigation	Mitigation Measures	Impact Category After Mitigation	Cumulative Impact
			specifications of the Habitat Enhancement Plan shall be approved by the County and CDFG prior to construction of the 1st improvement. At a minimum, the plan shall contain the following provisions: • Utilizing the oak tree survey data collected in 2003, final project plans shall clearly illustrate the size and location of all oak trees to be removed as part of the project and all oak trees to remain within 25 feet of construction activities. Prior to any construction, grubbing or tree removal, each mature coast live oak tree within the vicinity of the subject pads shall be clearly marked for removal or protection; • Protective fencing shall be installed around each oak tree to remain in place. The fencing shall be installed prior to grubbing/construction and provide protection of the root zone of oak trees (the outer edge of the tree root zone is 1-1/2 times the distance from the trunk to the drip line of the tree); • To further protect oak trees to remain in place, a certified arborist shall be retained by the applicant to perform any necessary trimming of oak tree limbs overhanging existing well pads and newly		

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PXP PHASE IV DEVELOMENT PLAN PROJECT

Impact		Impact Category Before Mitigation	Mitigation Measures	Impact Category After Mitigation	Cumulative Impact
			proposed well pads. This shall be conducted prior to allowing construction equipment and drilling rigs within well pads to avoid and/or minimize the potential for inadvertent damage to oak trees limbs (i.e., from drilling rig booms, etc.); • ~~Approximately 25% percent of the r~~Replacement oak trees shall be from ~~15 gallon stock and the remaining 75% from~~ vertical tubes or deep, one-gallon container stock. The 1~~5~~ gallon stock shall be evenly placed along the perimeter of the most visually prominent well pads as seen travelers on from Price Canyon Road (i.e., Maino 16NW); • Replanting shall be completed in the fall season ~~as soon as feasible (i.e.,~~ upon completion of grading within a given area~~)~~ and by a qualified individual familiar with native vegetation; • Location of newly planted oak trees shall adhere to the following whenever possible: on the north side of and at the canopy/dripline edge of existing mature native trees; north-facing slopes; within drainages swales; where topsoil is present; and if clustered, at least 10' "on-		

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PXP PHASE IV DEVELOMENT PLAN PROJECT

Impact	Impact Category Before Mitigation	Mitigation Measures	Impact Category After Mitigation	Cumulative Impact
		center" separation between each tree. Tree spacing will average approximately 15 feet on-center. Some clustering is acceptable to maintain a more natural appearance; and, • Newly planted trees shall be maintained until successfully established. This shall include protection (e.g., caging, tree shelters) from burrowing and browsing animals (e.g., deer, rodents), regular weeding (minimum of once early fall and once early spring) of at least a 3-foot radius around the plant base and adequate watering (i.e., drip irrigation system). Heavy mulching consisting of local oak leaf litter/mulch so seedlings are exposed to local mycorrhizal fungi to enhance survivability and growth is also recommended. Irrigation shall be slowly terminated over a 3-year period. If possible, planting during the warmest, driest months (June through September) shall be avoided. Replacement oak trees identified as dead and/or diseased during the monitoring period shall be replaced accordingly. C. Mitigation Measure Bio-2 (the tree removals shall be conducted as to avoid a take of		

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Impact		Impact Category Before Mitigation	Mitigation Measures	Impact Category After Mitigation	Cumulative Impact
			raptors or migratory birds).		
BIO-6	The proposed Phase IV Expansion will result in the permanent loss and/or long-term degradation and fragmentation~~disturbance~~ of natural habitats, which provide forage, cover, and breeding elements for a wide variety of wildlife species, including several special-status species.	2,3	The following measures shall be implemented to compensate for the permanent loss of vegetation resulting from project implementation and potential long-term degradation of adjacent habitat areas from projected long-term utilization of the site: A. Prior to construction of the 1st improvement authorized under this approval, the applicant shall dedicate an open space easement within the PXP property for long-term preservation. The dedicated easement shall be sufficiently sized and contain suitable habitat to accommodate a portion of the required oak replacement (estimated at 398 total), Pismo clarkia planting, and Well's manzanita planting. A conceptual location for the easement with approximate boundaries has been identified directly southwest of Signal 9N (refer to Figure 5.5-3). Please note that the exact location, size, and shape of the mitigation area are conceptual. The area contains a representative mixture of oak woodland, Well's manzanita series, and annual grassland with a known population of Pismo clarkia. Final specifications of the dedicated easement (size and location) shall be reviewed and approved by the County and CDFG prior to construction of the 1st improvement. In addition, future equipment staging areas, access routes, and	3	3

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Impact		Impact Category Before Mitigation	Mitigation Measures	Impact Category After Mitigation	Cumulative Impact
			additional well pads shall be prohibited in the dedicated easement area; and, B. Provision B of Mitigation Measure BIO-5 (Habitat Enhancement Plan) shall also contain measures to offset impacts to Pismo clarkia, Well's manzanita and oak woodland within the dedicated easement area. Specifically, the Habitat Enhancement Plan shall include species lists, installation and maintenance methods, performance criteria, and monitoring protocols for enhancing existing habitats within the dedicated easement area. At a minimum, the plan shall contain the following additional provisions: • Procedures to further mitigate permanent loss of California live oak woodland by augmenting existing oak woodland habitat within the dedicated easement with a portion of the required 4:1 ratio oak tree plantings; • Estimated permanent loss of 12 Well's manzanitas will also be compensated at a replacement ratio of 4:1 within selected areas of the dedicated easement containing appropriate soil conditions (i.e., chaparral and coyote brush scrub habitat areas); • Planting of Pismo clarkia as required by Mitigation Measure BIO-3 shall occur within		

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PXP PHASE IV DEVELOMENT PLAN PROJECT

Impact		Impact Category Before Mitigation	Mitigation Measures	Impact Category After Mitigation	Cumulative Impact
			selected areas of the dedicated easement to augment existing populations, concentrating the majority of seed dispersal along the northeastern perimeter of the existing oak woodland habitat; • Installation of all replacement planting and/or seed dispersal shall be conducted within the appropriate season to promote survivability (i.e., fall/winter). If possible, planting during the warmest, driest months (June through September) shall be avoided; • Shall provide procedures to ensure eradication of exotic plant species (i.e., pampus grass, tree tobacco, etc.) within the dedicated easement. This shall include provisions for controlling the spread of exotic species throughout the Phase IV expansion area; and, • Shall provide an implementation schedule which emphasizes initiation of the Habitat Enhancement Plan within the 1st year of improvements authorized under this approval. The schedule shall outline the sequencing of all mitigation planting and timing for long-term monitoring and maintenance of the dedicated open space easement through the life of the project.		

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Impact		Impact Category Before Mitigation	Mitigation Measures	Impact Category After Mitigation	Cumulative Impact
5.6	Cultural Resources				
CUL-1	Construction during the proposed project could result in the inadvertent damage to historic, cultural, archaeological, and/or burials during earthmoving activities.	2	Cultural Resource sites SLO-353, SLO-652, and SLO-1266 shall be avoided. Any future ground disturbances within a 150-foot buffer from the sites shall be subject to a subsurface archaeological excavation program to assess artifact presence in these areas. If artifacts do exist and cannot be feasibly avoided, a Phase 2 archaeological significance assessment program, and, if necessary, a Phase 3 data recovery mitigation program, shall be carried out by a qualified archaeologist and all construction activity within the sites and buffer areas shall be monitored by a qualified archaeologist and Native American monitor. The archaeological sites and buffer areas shall be indicated as "Environmental Sensitive Areas" on grading plans. If construction is proposed within 100 feet of the buffer areas, the areas shall be temporarily fenced to protect from disturbance. All significance assessment and mitigation activities hall be funded by the applicant. In addition, such buffer zones shall be observed for Areas A, B, and C. In the event that unknown cultural remains are encountered anywhere within the project area during construction, activities shall be terminated or redirected to another area until a qualified archaeologist can be retained to evaluate the potential significance of the finds in a Phase 2 archaeological significance investigation or PXP shall have the option to relocate work permanently without need to conduct further studies at that location. Relocation of work and any subsequent archaeological investigation would be done	3	3

IMPACT CATEGORIES

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SUMMARY OF IMPACTS AND MITIGATION MEASURES
PXP PHASE IV DEVELOMENT PLAN PROJECT

Impact		Impact Category Before Mitigation	Mitigation Measures	Impact Category After Mitigation	Cumulative Impact
			in consultation with the County of San Luis Obispo. . If they are significant and cannot be feasibly avoided, then a Phase 3 data recovery mitigation program shall be performed by a qualified archaeologist, and all construction activity within the site and 150-foot buffer area shall be monitored by a qualified archaeologist and Native American monitor. All Phase 3 significance assessments and Phase 3 mitigation activities shall be funded by the applicant.		
5.7	Geology and Soils				
GEO-1	Construction of the proposed project may result in a substantial, or potentially substantial, adverse change in the physical condition of the land.	3	No mitigation is required	3	3
GEO-2	Construction of the proposed project could result in short-term increases in erosion and sedimentation resulting from earth-moving operations and exposed soils.	2	In compliance with the Land Use Ordinance, the applicant will prepare and implement a Sediment and Erosion Control Plan (SECP) for the proposed project. The SECP will include: • Slope surface stabilization measures, such as temporary mulching, seeding, and other suitable stabilization measures to protect exposed erodible areas during construction, and installation of earthen or paved interceptors and diversion at the top of cut of fill slopes where there is a potential for erosive surface runoff; • Erosion and sedimentation control devices, such as energy absorbing structures or devices, will be used, as necessary, to reduce the velocity of runoff water to prevent polluting sedimentation	3	3

IMPACT CATEGORIES

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PXP PHASE IV DEVELOMENT PLAN PROJECT

Impact		Impact Category Before Mitigation	Mitigation Measures	Impact Category After Mitigation	Cumulative Impact
			discharges; • Installation of mechanical and/or vegetative final erosion control measures within 30 days after completion of grading; • Confining land clearing and grading operations to the period between April 15 and October 15 to avoid the rainy season; • Minimizing the land area disturbed and the period of exposure to the shortest feasible time; • The SECP will be prepared in accordance with the Land Use Ordinance; and, • Install long-term drainage devices at new/modified well pads, including headwalls, basins, culverts with down-drains and energy dissipating devices (riprap or diffusers). In compliance with Section 23.05.020 – Grading, the applicant will prepare a grading plan for the project. PXP will comply with the requirements under a general stormwater construction permit, which may be required by the RWQCB for the project. Such requirements may include~~Prior to construction, the applicant will develop a~~ preparation of ~~Storm~~a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP ~~will~~ would include provisions for the installation and maintenance		

IMPACT CATEGORIES

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PXP PHASE IV DEVELOMENT PLAN PROJECT

Impact		Impact Category Before Mitigation	Mitigation Measures	Impact Category After Mitigation	Cumulative Impact
			of Best Management Practices to reduce the potential for erosion of disturbed soils at the Project site.		
GEO-3	Groundwater quality may be impacted by the project.	3	To minimize any impact on groundwater downgradient from the site, petroleum products should be removed from wastewater generated in the oil recovery process prior to reinjection. In addition, the water quality of the shallow aquifer zone beneath and downgradient from the site should be monitored regularly to detect any water quality impacts of project activities (e.g., steam or produced water injection). This can be accomplished by ~~semi-annual~~ monitoring of wells on the property. The number of wells and well locations and frequency should be adequate to detect any impacts to water quality as determined by the ~~Regional Water Quality Control Board (RWQCB)~~appropriate jurisdictional authority. See also HAZ-1D. ~~Semi-annual reports shall be provided to RWQCB and the County of San Luis Obispo.~~ Copies of any reports shall be promptly provided to the County.	3	3
5.8	Paleontological Resources				
PAL-1	Construction-related activities may uncover and adversely affect paleontological resources.	2	Prior to approval of the project, the applicant shall retain a qualified paleontologist to develop a paleontological mitigation monitoring plan that includes the following: 1. The prior to construction, the applicant will retain a qualified paleontologist to implement the mitigation plan and maintain professional standards of work. 2. A qualified monitor will perform full-time monitoring	3	3

IMPACT CATEGORIES

1	Significant and Unavoidable	3	Less Than Significant
2	Significant and Avoidable (mitigable)	4	Beneficial

TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES
PXP PHASE IV DEVELOMENT PLAN PROJECT

Impact	Impact Category Before Mitigation	Mitigation Measures	Impact Category After Mitigation	Cumulative Impact
		of all grading, enlargement of pads and all other open excavation work in native sediments. Monitoring will include inspection of exposed surfaces and microscopic examination of matrix. The monitor will have authority to divert grading away from exposed resources temporarily in order to recover the specimens and contextual data. PXP shall have the option to relocate work permanently without need to conduct further studies at that location. Relocation of work and any subsequent paleontological investigation would be done in consultation with the County of San Luis Obispo. Cooperation and assistance from on-site personnel will greatly assist timely resumption of work in the area of the discovery. 3. If the discovery meets the criteria for a fossil locality, formal locality documentation activities will be performed. 4. If microfossil localities are discovered, locality documentation activities shall include the collection of matrix material for processing. These activities may include use of equipment to excavate fossil-containing soils, and establishment of stockpiles away from the construction area. Testing of stockpiles shall consist of screen washing small samples (200 pounds) to determine if fossils are present. Productive tests shall result in screen washing of additional matrix from the stockpiles to		

IMPACT CATEGORIES

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TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES
PXP PHASE IV DEVELOMENT PLAN PROJECT

Impact		Impact Category Before Mitigation	Mitigation Measures	Impact Category After Mitigation	Cumulative Impact
			a maximum of 6000 pounds per locality. 5. Fossils recovered shall be prepared, identified and cataloged, and donated to an accredited repository designated by the County of San Luis Obispo. Any resources determined not to meet significance criteria shall be offered to local schools for use in educational programs. 6. The principal investigator shall prepare monthly progress reports to be filed with the applicant and the County of San Luis Obispo. The principal investigator shall prepare a final report to be filed with the applicant and the County of San Luis Obispo. The report shall include a list of resources recovered, documentation of each site/locality, interpretation of resources recovered and shall include all specialist's reports as appendices		
5.9	Noise				
NO-1	Construction activities would result in short-term noise impacts to nearby residences.	2	The authorization of future well and well pad construction associated with the Conditional Use Permit for this project should incorporate the following mitigation measures. Coordination between the County, the applicant, and a third-party monitor shall occur to ensure effective implementation of these measures. Excluding drilling activities, no use of heavy equipment or heavy-duty trucks shall occur between 7 p.m. and 7	3	3

IMPACT CATEGORIES

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TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES
PXP PHASE IV DEVELOMENT PLAN PROJECT

Impact		Impact Category Before Mitigation	Mitigation Measures	Impact Category After Mitigation	Cumulative Impact
			a.m. Noise attenuation blankets or other devices with a sound transmission class of 25 or greater shall be installed at Signal 113D and Morehouse 303 at a height exceeding the highest exhaust outlet and in a line-of-sight alignment so as to minimize noise attenuation ~~to completely enclose each drilling operations~~ at these ~~two well pads sites. The noise attenuation devices shall be at least 24 feet tall, and openings used for equipment access shall be offset to prevent line of sight loss of attenuation.~~ Equipment engine covers shall be in place and mufflers shall be in good condition.		
NO-2	Operation of the steam generators may result in noise impacts to nearby residences.	3	No mitigation is required.	3	3
NO-3	Operation of the oil well pumping units may result in an increase in noise levels at nearby residences.	3	No mitigation is required.	3	3
NO-4	The additional 25 truck trips/day to transport the produced oil from the proposed project may increase noise levels along Price Canyon Road.	3	No mitigation is required.	3	3
5.10	Hazards/Risk of Upset				
HAZ-1	Well drilling, workover, re-drilling, or steam injection activities could experience a well blow-out resulting in the uncontrolled release of fluids and possibly explosion and fire.	2~~3~~	~~No mitigation is required.~~ HAZ -1A - Prior to initiation of well drilling activities, the applicant shall complete table-top and field emergency training with CDF/County Fire, County Hazardous Materials Team, and DOGGR. PXP shall provide	3	3

IMPACT CATEGORIES

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TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES
PXP PHASE IV DEVELOMENT PLAN PROJECT

Impact		Impact Category Before Mitigation	Mitigation Measures	Impact Category After Mitigation	Cumulative Impact
			CDF/County fire with actual costs to cover the expenses of the training exercises, including overtime and equipment replacement. The amount of this training shall not exceed $8,000 every two years of $4,000 annually. HAZ 1B – The applicant will complete annual inspections with the CDF/County Fire Department to ensure compliance with the County adopted California Fire Code, currently the 2001 version. HAZ 1C – PXP shall submit a Notice of Intent and obtain written approval from the State Oil and Gas Supervisor prior to drilling, reworking, injecting into, plugging, or abandoning any well. The Notice of Intent will be reviewed by DOGGR on an engineering and geological basis. PXP will be required to submit detailed geological and engineering information to support the project. Approval will be subject to protection of the public and the environment by using adequate blowout prevention equipment. DOGGR will monitor potential risks from critical wells (wells located in close proximity to Price Canyon Road and the UPRR railroad) as part of their well application review process. HAZ 1D – Prior to approval, PXP shall develop a contingency plan for proper wastewater handling in the event that adequate wastewater injection capacity cannot be developed.		

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TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES
PXP PHASE IV DEVELOMENT PLAN PROJECT

	Impact	Impact Category Before Mitigation	Mitigation Measures	Impact Category After Mitigation	Cumulative Impact
HAZ-2	An oil spill could occur at abandoned wells or other surface locations at the project site during water injection or steam injection activities.	2	During water injection and steaming operations, PXP shall make daily inspections of drainages, known nearby well sites, and surface ~~exposures of oil sands~~ seeps within the 2,000 feet of the injection locations to identify oil release at the ground surface. In the event of a spill release, the applicant shall immediately notify the appropriate regulatory agencies of the discovery and implement spill response, mitigation, and clean-up activities. As required by DOGGR, abandoned oil wells identified to have the potential to release oil to the environment shall be re-abandoned to current DOGGR standards. HAZ-2B – The applicant shall store on-site cleanup materials including diking materials and absorbent material such as pads and booms that will be accessible to the fire department in case of emergency. The applicant shall provide CDF/County Fire with two gas detectors for the closest responding fire engines or HAZ MAT Unit who would respond to an incident at the oil fields or along the travel routes to the refinery. These detectors shall be capable of detecting combustible levels and Hydrogen Sulfide (H2S) levels and will be the equivalent of the iTX Multi-Gas Monitor.	3	3
HAZ-3	The proposed project could generate risks to the public safety and the environment by exposure to crude oil spills, ~~and~~ subsequent fires during transportation and wildfires due to operations.	23	~~No mitigation is required.~~ HAZ-3A – On an annual basis, the applicant shall provide CDF/County Fire and County Environmental Health with their emergency response plan for review and approval. The plan will include procedures and annual training exercises with CDF/County Fire, the County Hazardous Materials Team, and other appropriate agencies on handling a	3	3

IMPACT CATEGORIES

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TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES
PXP PHASE IV DEVELOMENT PLAN PROJECT

Impact		Impact Category Before Mitigation	Mitigation Measures	Impact Category After Mitigation	Cumulative Impact
			petroleum or hydrogen sulfide emergency at the Project Site. See Mitigation Measure HAZ-1A. HAZ-3B – The applicant shall produce CDF/County Fire a Fire Hydrant System plan for approval prior to construction. This plan shall be implemented before construction commences. HAZ-3C – PXP shall submit a vegetation management plan to CDF/County Fire for approval prior to issuance of construction permits. This will identify measures to minimize the risk of wildfires due to operation of existing and proposed new pipelines and powerlines. It will also make recommendations for protection of such facilities from a wildlife fire.		
HAZ-4	An oil spill could possibly enter Pismo Creek.	2	Prior to commencement of oil production from Phase IV wells, PXP's Spill Prevention Control and Countermeasure Plan for the Arroyo Grande oil field should be updated to address the increased production and spill scenarios. The SPCC update should include measures to both reduce the likelihood of an oil spill entering the creek through engineered containment devices and regular monitoring. Also refer to mitigation measures HAZ-2A and HAZ-2B. Furthermore, approval of the Notice of Intent by DOGGR will be subject to proper oil spill H_2S contingency plans and protecting all subsurface hydrocarbons and fresh waters by using approved drilling and cementing techniques.	3	3
HAZ-5	An accidental release of gas containing hydrogen sulfide could pose a risk to on-site worker or adjacent populations.	~~3~~	~~No mitigation is required.~~ Refer to Measures HAZ-2 and HAZ-3A.	3	3

IMPACT CATEGORIES

1	Significant and Unavoidable	3	Less Than Significant
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CHAPTER 3.0
PROJECT DESCRIPTION

3.1 INTRODUCTION

The Plains Exploration and Production Phase IV Development Plan has been proposed by Plains Exploration and Production (PXP) to expand its existing operations of the Arroyo Grande oil field. The proposed project includes the following (see Section 3.4.3 for detailed discussion):

- Grading of 4 new well pads (total disturbance of about 2.68 acres);
- Grading on 18 existing well pads (total disturbance of about 4.22 acres);
- Construction of 95 production wells;
- Construction of 30 injection wells;
- Construction of 3 new steam generators (previously approved in the 1994 Phase III Development Plan); and,
- Increasing production of marketable quality crude oil from 1,800 – 1,900 barrels of per day (BOPD) to 5,000 BOPD.

3.2 PROJECT LOCATION

The Arroyo Grande oil field is located in Price Canyon about 3 miles northeast of Pismo Beach in San Luis Obispo County, California. The project site is located east and west of Price Canyon Road near its intersection with Ormonde Road, between Highway 101 and Highway 227. Refer to Figure 3-1. The proposed Phase IV project lies within the 264-acre Phase III development project approved by the San Luis Obispo Planning Commission (SLOPC) in Resolution 94-49, Development Permit No. D910026D, which was delineated in the 1994 Shell Western Development Plan EIR (1994 EIR). This site lies primarily within the 320-acre Arroyo Grande oil field, which is within the larger 1,480-acre Price Canyon Unit as defined by the California Division of Oil, Gas & Geothermal Resources (DOGGR). Refer to Figure 3-2.

3.3 PROJECT OBJECTIVES

The objective of the Phase IV Project is to increase the amount of marketable quality crude oil produced using a thermal (steam injection) process. Currently, approximately 1,800-1,900 BOPD (657,000-693,500 barrels of oil per year) are produced. The Phase IV project is anticipated to increase field production levels to 5,000 BOPD, or 1,825,000 barrels of oil annually.

Estimates for heavy crude oil production are based on an oil to steam ratio (OSR). The average OSR has been 0.32 for current operations. Table 3.3-1 provides an overview of both the projected steam output for the Phase IV Project and the estimated heavy crude oil that will be produced.

This oil field has been developed in phases consistent with an overall master plan, which identified the project area as an extractive resource area and outlined long-term operations and goals for the oil field. In 1978, Teal Petroleum (previous operator) obtained approval for what was called “Phase I”. In 1982, Grace Petroleum (pervious operator) received approval for a smaller Phase II project In 1994, Shell Western Exploration and Production, Inc. (previous operator) received approval of a Phase III expansion. See Section 3.4.1 for more detail. The proposed Phase IV expansion project’s objectives of increasing the amount of crude oil

produced are consistent with the overall goals of the master plan, as well as the County's Energy Element (see Chapter 4.0 Land Use Policy Consistency for discussion).

3.4 PROJECT DESCRIPTION

3.4.1 Background

According to unofficial records, the Arroyo Grande oil field has been an actively producing field since 1906. DOGGR records officially began recording oil and gas wells for the area in 1919. Between 1919 and 1980, roughly 129 oil wells were drilled in the field. Previous EIRs have been prepared for past expansion of the oil field, including *Final Environmental Impact Report for the Proposed Arroyo Grande Thermal Project, Teal Production Company (1978),* and *Arroyo Grande Thermal Project, Phase II Operations (ERCO 1981).* In 1978, Teal Petroleum (Teal) obtained approval from the SLOPC for the expansion of oil field operations (Phase I).

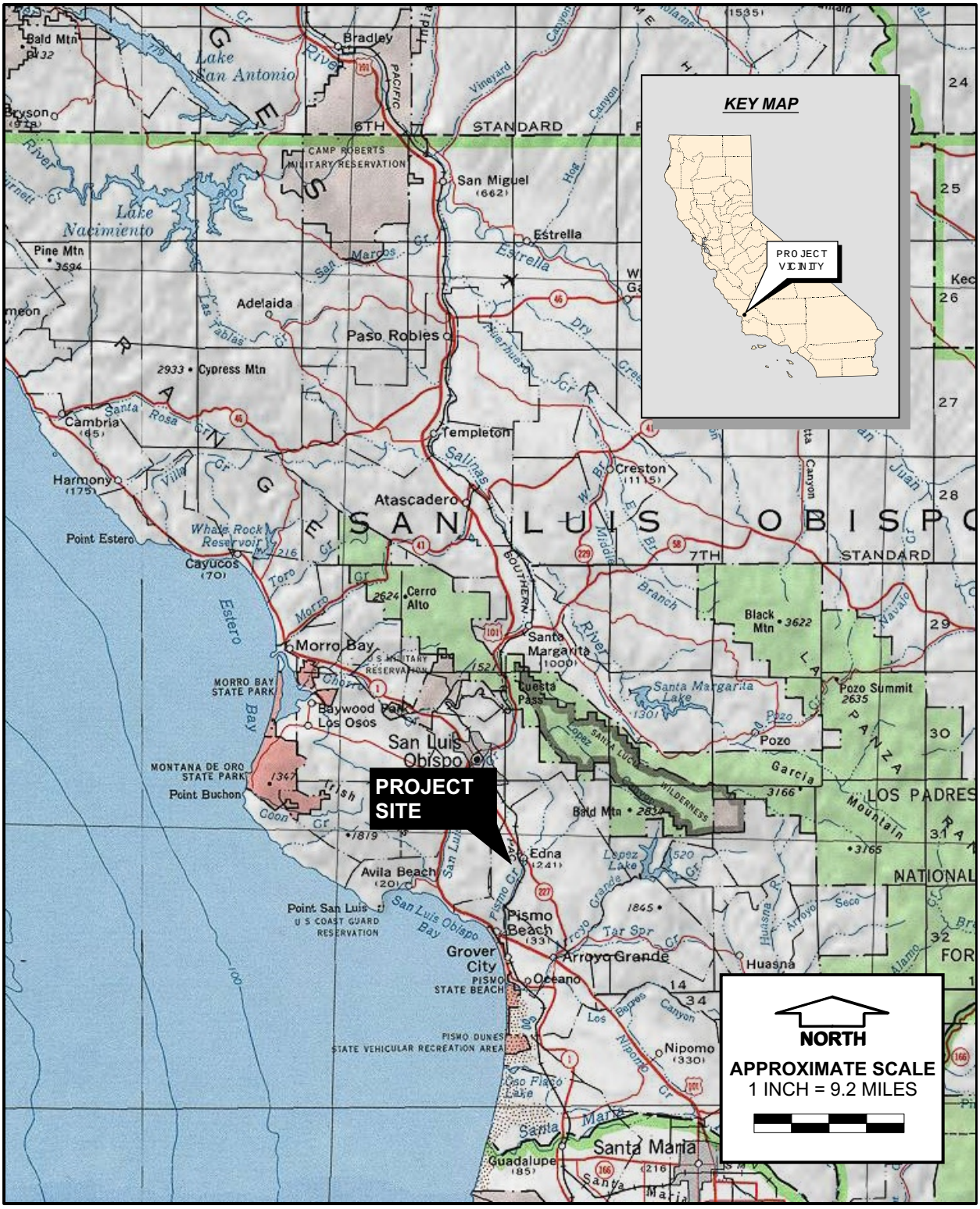
Table 3.3-1
Estimated Quarterly Steam Generation and Crude Production

Development Schedule	Estimated Steam BBL/Day[1]	Estimated Crude Oil Sales BBL/Day[2]
Current Operations	6,000	1,900
Second Quarter 2003	6,000	1,900
Third Quarter 2003	6,800	2,180
Fourth Quarter 2003	7,600	2,430
First Quarter 2004	7,600	2,430
Second Quarter 2004	7,600	2,430
Third Quarter 2004	10,600	3,390
Forth Quarter 2004	10,600	3,390
First Quarter 2005	10,600	3,390
Second Quarter 2005	10,600	3,390
Third Quarter 2005	13,600	4,350
Forth Quarter 2005	13,600	4,350
First Quarter 2006	13,600	4,350
Second Quarter 2006	13,600	4,350
Third Quarter 2006	16,600	5,300
Forth Quarter 2006	16,600	5,300

Note: Post 2006, the three new steam generators, previously reviewed and approved in 1994, will be constructed to provide supplemental cyclic steam and back-up capability to the existing generators. It is not anticipated that installation of the pre-fabricated steam generators will overlap drilling or drilling pad construction.

[1] Based on bringing on line existing generators Nos. 2&4 (APCD permitted) the second quarter of 2005 and 2006 for a total of 6 operating steam generators

[2] Assumes an addition of 40 wells in operation during 2004, 40 wells in operation during 2005, and 40 wells in 2006, 5 wells in 2007.



Source: TOPO! c 2001 National Geographic Holdings (www.topo.com)

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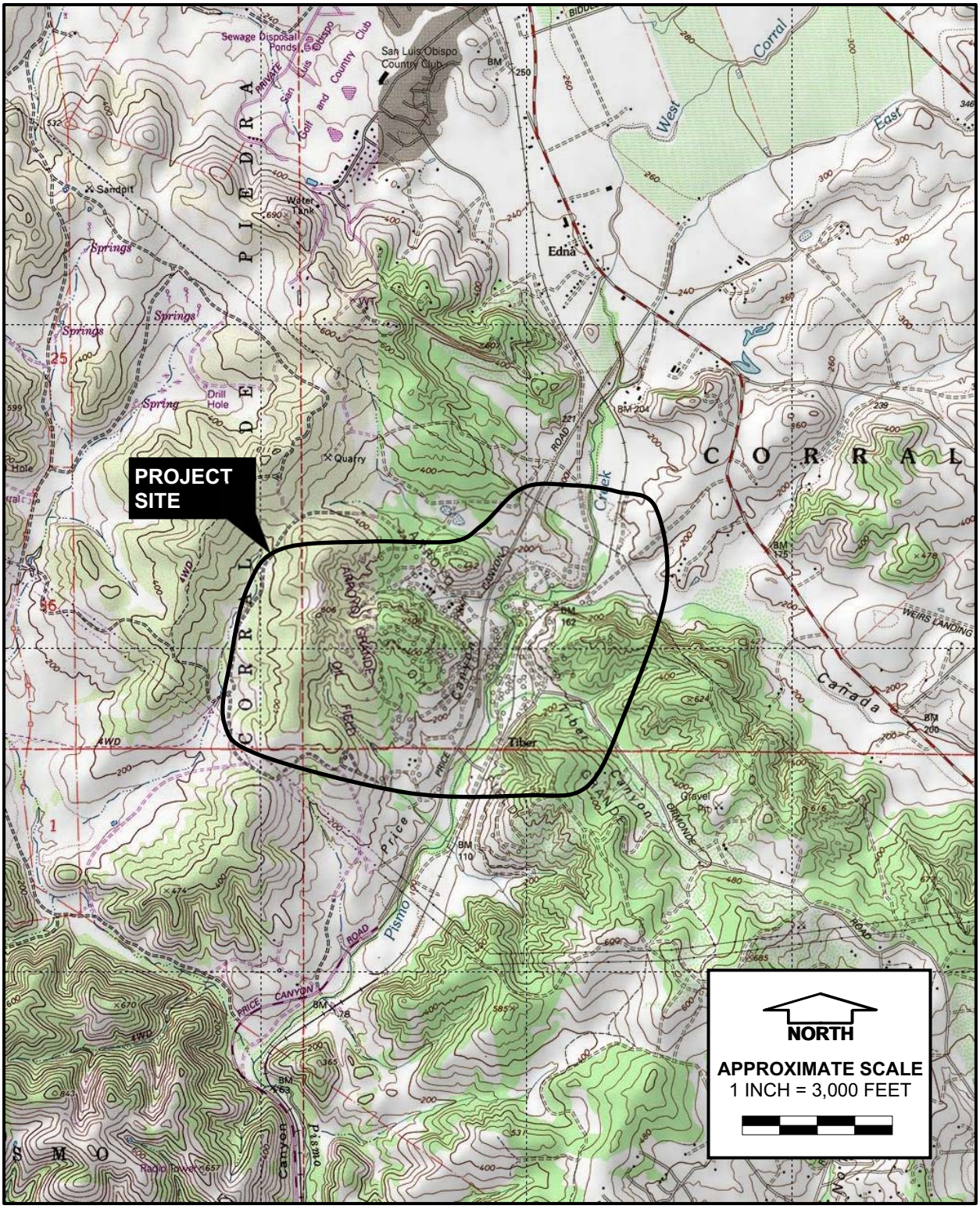
SITE VICINITY MAP

PXP Phase IV Development Plan EIR

FIGURE 3-1



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SITE LOCATION MAP

PXP Phase IV Development Plan EIR

FIGURE 3-2

The permit granted the drilling of 54 wells and the installation of associated equipment. In the event that Teal wanted to drill additional wells, the County required a Development Plan application for each additional well group. Teal Petroleum was absorbed by Grace Petroleum shortly thereafter.

Grace Petroleum proposed a Phase II expansion. The subsequent EIR considered the potential environmental effects of the entire Arroyo Grande Oil field. In 1982, The County certified the EIR and approved a Phase II Project consisting of 40 wells and 1 steam generator. Under Phase II, individual wells could be constructed and drilled at the rate of no more than 40 producible wells per year. At that time, the County conceptually approved, but did not guarantee, an additional 160 wells and 3 steam generators.

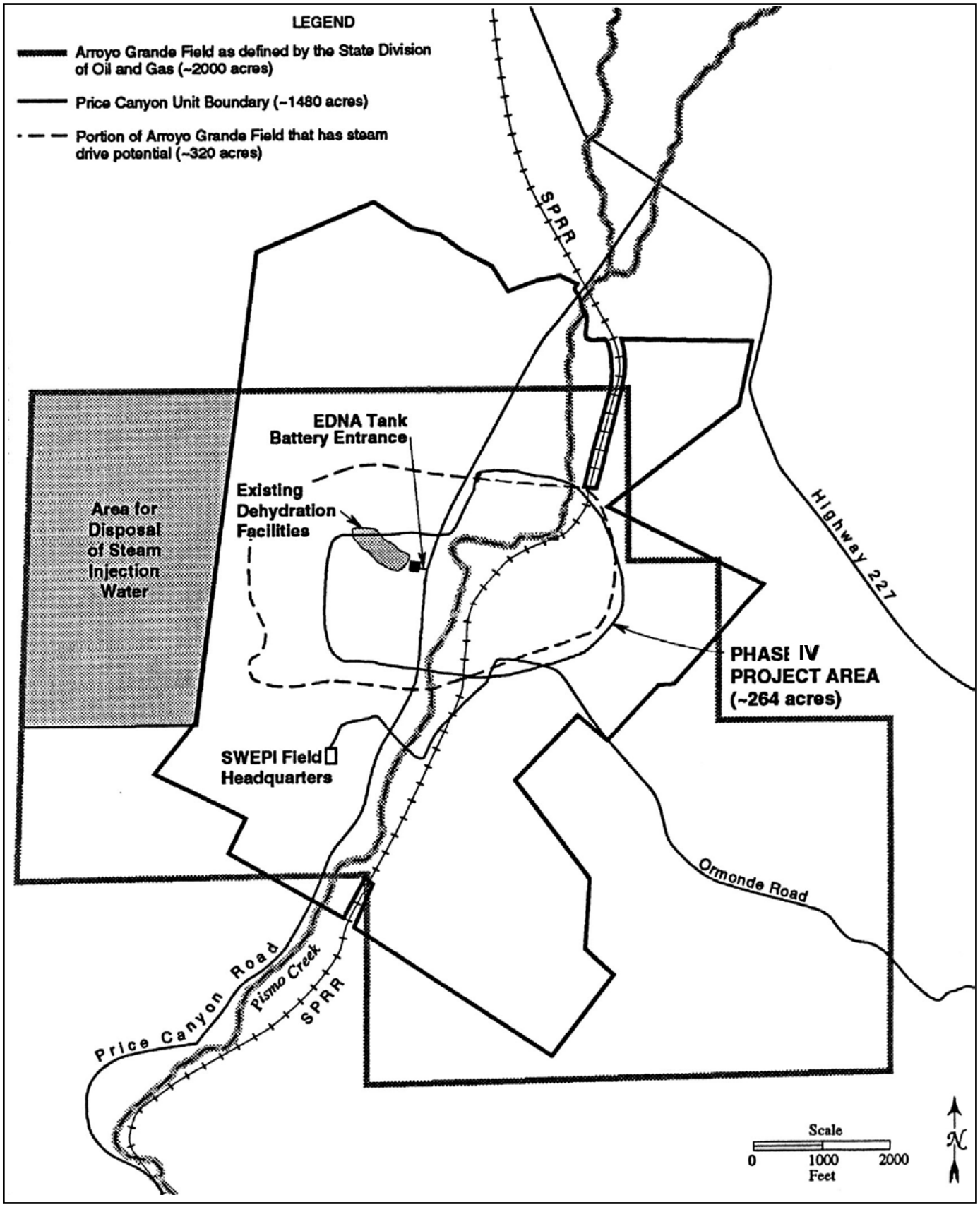
The conceptual approval included a delineation of Phases III, IV, and V and included only the facilities that would be added during each phase; the areas that would be developed during each of these future phases were not designated at that time. Additionally, the 1982 EIR noted that each Development Plan may authorize fewer but no more than the listed facilities and any required accessory equipment. Subsequently, Grace was acquired by Shell Western Petroleum, Inc.

In 1994, Shell Western Exploration and Petroleum, Inc., received approval from the SLOPC for a Development Plan to allow expansion of the oil field by drilling 65 additional producing wells and installing three steam generators and accessory facilities with an extended phasing schedule (Phase III). In 1997, the area was acquired by Stocker Resources, Inc. (Stocker), which currently operates the facility. Stocker recently underwent change of ownership and is now Plains Exploration & Production Company (PXP).

3.4.2 Existing Operations

3.4.2.1 Production

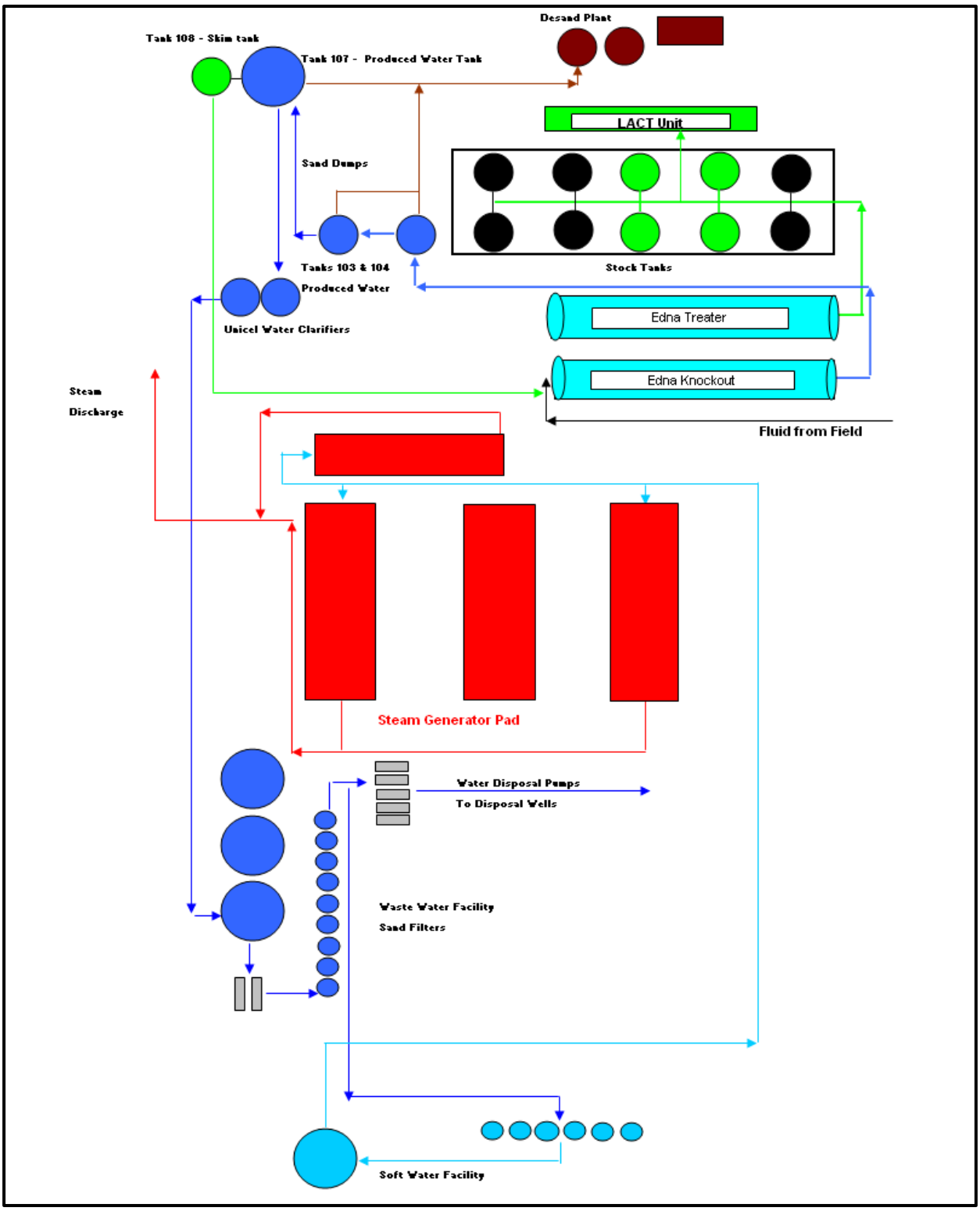
PXP currently produces approximately 1,800-1,900 BOPD from about 125 producing wells in the 320-acre Arroyo Grande oil field, whose boundary is defined by the DOGGR. The Arroyo Grande oil field, and the Price Canyon Unit are shown in Figure 3-3. Many of the existing wells on the property are collocated with steam injection wells, which provide steam for enhanced oil recovery. Other existing production facilities include above-ground pipelines, 6 steam generators (4 west of Price Canyon Road; 2 east of the road), “steam headers” (which distribute steam to the steam injection wells), a dehydration facility for the entire field and a gas plant. The dehydration and gas plants are located on the west side of Price Canyon Road. The dehydration plant has several associated facilities, including heater treaters, oil storage tanks, vapor recovery compression, water softening equipment, and sand filters. The gas plant processes about 1.5 million standard cubic feet per day (MMSCFD) of associated gas (“casing gas”) that contains an average of 25% CO_2, and 5,000 ppm H_2S, which is removed using a patented absorption process. The resulting waste steam is reinjected into designated injection wells. All hydrocarbon pipelines crossing underneath Price Canyon Road and Pismo Creek are contained within “conductor pipelines,” which are intended to contain any oil spills that could occur from these pipelines. Figure 3-4 shows a fluid schematic of the oil field.



Source: SAIC 1994

PROPOSED PROJECT SITE

FIGURE 3-3



Source: PXP

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ARROYO GRANDE OIL FIELD FLUID SCHEMATIC

FIGURE 3-4

3.4.2.2 Steam Injection

The primary method of steam injection utilized at the Arroyo Grande oil field is steam flooding (with some associated cyclic steaming). Steam is injected into "injection" wells where it raises the temperature of the oil reservoir, decreases the oil viscosity, and floods or pushes the oil to "producing" wells which surround each injector. Periodically production wells are selected to be cyclic steamed, wherein a relatively "small" volume (relative to injectors) is injected into the well and produced back to enhance its productivity.

The steam injection process increases the temperature of the oil to reduce the characteristically high viscosity of approximately 3,500 centipoises at 90° F. At lower viscosity, the oil flows more easily. Steam is injected at 500 to 800 pounds per square inch gauge (psig). The oil and water is pumped to the surface from the well to the tank battery facility for separation. The reservoir temperature is approximately 90° F and the corresponding viscosity is 3,500 centipoises (cp).

3.4.2.3 Steam Generators

PXP currently has six steam generators located in the Arroyo Grande oil field: five (5) 50 million metric British thermal units per Hour (MMBTU/hr) systems and one (1) 20 MMBTU/hr, fueled by natural gas. These units each produce steam at a maximum of 1,500 psig and a temperature of 500°F. Site-produced water is used at a rate of 6,000 bbls per day at 65°F. Fuel consumption for a fully utilized 50 MMBTU/hr steam generator consumes about 1,200 thousand standard cubic feet per day (1,200 MSCF/D) of natural gas with a heat content of 1,000 BTU/SCF.

All of the existing steam generators are fueled by pipeline quality natural gas supplied by the gas plant, supplemented with gas from Southern California Gas Company and landfill gas from the nearby Cold Canyon Landfill.

All six existing steam generators are connected to the flow line system, and steam is transported as required through a closed pipeline system to the well heads. All of the six existing steam generators have operating permits issued and enforced by the San Luis Obispo Air Pollution Control District (APCD).

3.4.2.4 Produced Water Management

Producing wells pump water (in emulsion with oil) at a ratio of 8 barrels of water to 1 barrel of oil (water output to oil output)[1]. Approximately 3 barrels of steam are required to produce 1 barrel of oil. As such, the water recovered per barrel is actually a combination of the condensed steam pumped into the ground and water located naturally in the reservoir rock with the oil. This recovered water is called "produced water" and when separated from the oil, the produced water is used in the steam generators to produce steam for thermal injection or disposal via water injection wells. If necessary, water pumped from existing water wells can be used to augment the water supplied to the generators.

[1] This ratio is the difference of the oil to steam ration (OSR), which is the ratio of oil output to steam or water input. The OSR for current operations is 0.32.

The produced water and groundwater must undergo filtration and processing prior to use in the generators. The existing water treatment system utilized to accomplish this task is located at the Edna unit. The system includes a water holding tank, flotation cells, sand filters and water softening units. Water entering the treatment system comes principally from the free water knockout vessels and the heater treaters. Small volumes of water may enter from other process sources. The water first passes through the wash tanks and then enters a flotation cell where entrained oil is removed from the produced water. The oil is then returned to the tank battery system and then sent to storage. The water passes through a series of sand filter vessels to remove particulate matter. After the sand filtering, the water passes through a sodium zeolite water softening unit and then is pumped to the steam generators.

The produced water not used for steam generators is sent to the flotation cell and sand filters to remove entrained oil and then reinjected through waste water injection wells to approved subsurface disposal zones as per California Division of Oil, Gas, and Geothermal Resources (DOGGR) requirements. This water is not suitable for irrigation or potable use.

Water pumped from groundwater wells is stored in a 30,000-barrel reservoir lined with a bentonic clay liner. This water is used for steam generator make-up water and irrigation. Table 3.4-1 gives the water quality characteristics of the groundwater wells onsite.

Table 3.4-1
Water Quality and Quantity in Vicinity of Arroyo Grande Oil field

Constituents	Well #1	Well #2	Well #3
Calcium, Ca (Hardness as $CaCO_3$)	50 mg/l	110 mg/l	30 mg/l
Magnesium, Mg (Hardness as $CaCO_{3)}$	30 mg/l	70 mg/	15 mg/
Total Hardness as $CaCO_3$	80 mg/l	180 mg/l	45 mg/l
Chloride, CL	37.5 mg/l	45 mg/l	32.5 mg/l
Sulfate, SO_4	27.5 mg/l	26 mg/l	29 mg/l
Total Dissolved Solids as ppm $CaCO_3$	122 mg/l[1]	210 mg/l	102 mg/L
Iron Fe (total)	0.04 mg/l	0.03 mg/l	0.03 mg/l
Sulfide	0 mg/l	0 mg/l	0 mg/l
ph	6.2	6.6	5.8
Conductivity in Ohm-meters	305 micro ohms/cm	515 micro ohms/cm	225 micro ohms/cm
Turbidity, FTO	12	9	20
Alkalinity as $CaCO_3$, Total	50 ppm[2]	150 ppm	25 ppm
Alkalinity as $CaCO_3$, Pheno	0 ppm	0 ppm	0 ppm
Alkalinity as $CaCO_3$, Metluf Red	50 ppm	150 ppm	25 ppm
Undissolved Solids 45 a+	3.28 ppm	0.68 ppm	1.08 ppm
Pump Rate in gpm	~150 gpm[3]	~150 gpm	~150 gpm

Source: Phase II Operations Arroyo Grande Thermal Project, Grace Petroleum Corporation, Final EIR, June 1981.

1. Milligrams per liter = mg/l
2. Part per million = ppm
3. Gallons per minute = gpm

3.4.2.5 Tank Battery Facilities

There is one tank battery facility currently operating in the Edna unit. This facility consists of four 1,000-barrel storage tanks and six 2,000-barrel storage tanks, a heater treatment system (including the two free water knockout vessels and two heater treaters) and an emergency produced-water holding pond.

The tank battery facilities are used both to separate the heavy crude oil from produced water (dehydration) and to store the oil until sold. The oil and water mixture pumped from the wells is transported to the battery facilities where it is pumped into the free water knockout vessel. Approximately 80 percent of the produced water is removed from the oil and sent to the water reclamation system. The remaining oil and water mixture flows under pressure to a gas-fired heater treater (a heat exchanger used to heat liquid) where the remaining water is removed and pumped to the water reclamation system, while the oil is transferred to the storage tanks. All tank facilities are connected to a vapor recovery system which captures hydrocarbon vapors and sends them to the gas plant for treating prior to use as generator fuel.

The vapor recovery system also captures vapors at the oil truck loading rack. The produced oil that is stored in the large onsite tanks is eventually transferred to 160-barrel oil trucks for salesand transportation to market. As the oil is loaded into the trucks (by submerged filling), the rising oil level displaces hydrocarbon vapors in the truck tank. These vapors exit through vents in the top of the truck tank, which are temporarily connected to the vapor recovery system by a hose.

3.4.2.6 Pipeline System, Flow Lines, and Vapor Recovery System

The vapor recovery system is comprised of a closed pipeline and compression system that maintains suction on the well heads, loading rack, tanks and other vessels, maintaining an oxygen free atmosphere on tanks and vessels with the excess being sent to and treated in the gas plant for combustion fuel. This system is designed to collect in excess of 99% of all vapors, remove liquids, and send it to the gas plant where it is processed and used as fuel. The vapor recovery system minimizes hydrocarbon emissions to the atmosphere. Vapors are reinjected into the oil reservoir in the event of a short-term breakdown. A flare system serves as a redundant back-up in case of extended shutdowns.

The flow line pipeline system moves oil, produced water, including water used to keep wells safe while being worked over, and steam throughout the project site area. The system is controlled by headers that are valving arrangements used for switching the flow of produced water and steam from one well to another and directing the flow of oil to the tank battery. The killwater pipelines are connected to all the wells through the production headers, which can backflow killwater to the wellhead. In most cases existing steam, killwater and production piping is installed above ground. All new piping is installed above ground, either laying on the surface or installed in hangers. Other facilities include pipeline manifolds, blowdown tanks, automatic well test units (AWTs), and casing vapor recovery compressors. A manifold collects well production lines into a single unit for testing purposes. The blowdown tank is used during starting up or stopping a steam generator. It holds water temporarily while it is either being heated up to steam quality or while it is cooling down. The casing vapor recovery compressor is used to optimize the performance of the vapor recovery system.

3.4.2.7 Public Utilities

Electricity is provided by the PXP cogeneration unit, supplemented by Pacific Gas & Electric Company (PG&E). Natural gas is provided by Southern California Gas Company (SCGC), supplemented by the gas plant and nearby Cold Canyon Landfill. The majority of the water needed for thermal injection is produced during oil production. Three onsite groundwater wells located in the northern part of the oil field will be used for the reservoir and for makeup water.

3.4.2.8 Employment

There are 30 PXP and contract employees at the Arroyo Grande Oil field consisting of a supervisor, an office clerk, engineers, and maintenance and operation employees.

3.4.3 Proposed Project

The project would consist of two phases: (1) Construction Phase, and (2) Operational Phase. Construction would include 95 new producer wells and 30 steam injector wells (which are needed to enhance recovery of the heavy crude oil found at the site). Existing ancillary equipment, such as heater treaters, storage tanks and pollution control equipment is adequate to support the proposed project expansion. All of the producing wells will occur within the 264-acre Phase III boundary. The project would include the construction of three steam generators originally approved during the Phase III expansion, but never constructed. The remaining existing pads will require from minimal to moderate grading. The new pads that are required would be accessible from the existing roads; therefore, no new roads are proposed. About seven previously undisturbed acres will be disturbed, to varying degrees, by the proposed expansion. Figure 3-5 shows the Phase IV Development Area.

3.4.3.1 Producer and Injector Wells

Oil production is expected to increase from 1,900 BOPD up to 5,000 BOPD from the 95 new producer wells. Current drilling technology allows PXP to directionally drill (i.e., slant drill) the new wells at angles of about 3% depending on the particular configuration of the oil reservoir, geology and economics. Therefore, they will utilize existing well pads to the extent possible; thereby minimizing disturbance of new areas. Figure 3-6 shows the locations of the existing well pads that will be modified and the new well pads that will be constructed. The existing and new well pads, as well as the area of disturbance and the number of new well to be installed are listed in Table 3.4-2.

The Phase IV drilling program will require utilization of 31 existing well pads; only 4 new pads will be graded. About 45% of the existing pads will require no additional ground disturbance, other than during well drilling. The proposed project utilizes existing pads for 90% of new wells. The four new well pads, containing 10% of the new wells, will require 2.68 acres of ground disturbance. Minimal to moderate grading is required on 18 existing pads cumulatively totaling about 4.22 acres. By comparison, the 1994 Phase III EIR anticipated up to 66% of the Phase III wells would be newly graded pad locations.

The proposed new pad sites include Maino 16NW, Rock 85A, and Signal 66C, which will be visible to some degree at short intervals from Price Canyon Road, consistent with the analysis of the 1994 EIR.

Source: County of San Luis Obispo & EDA

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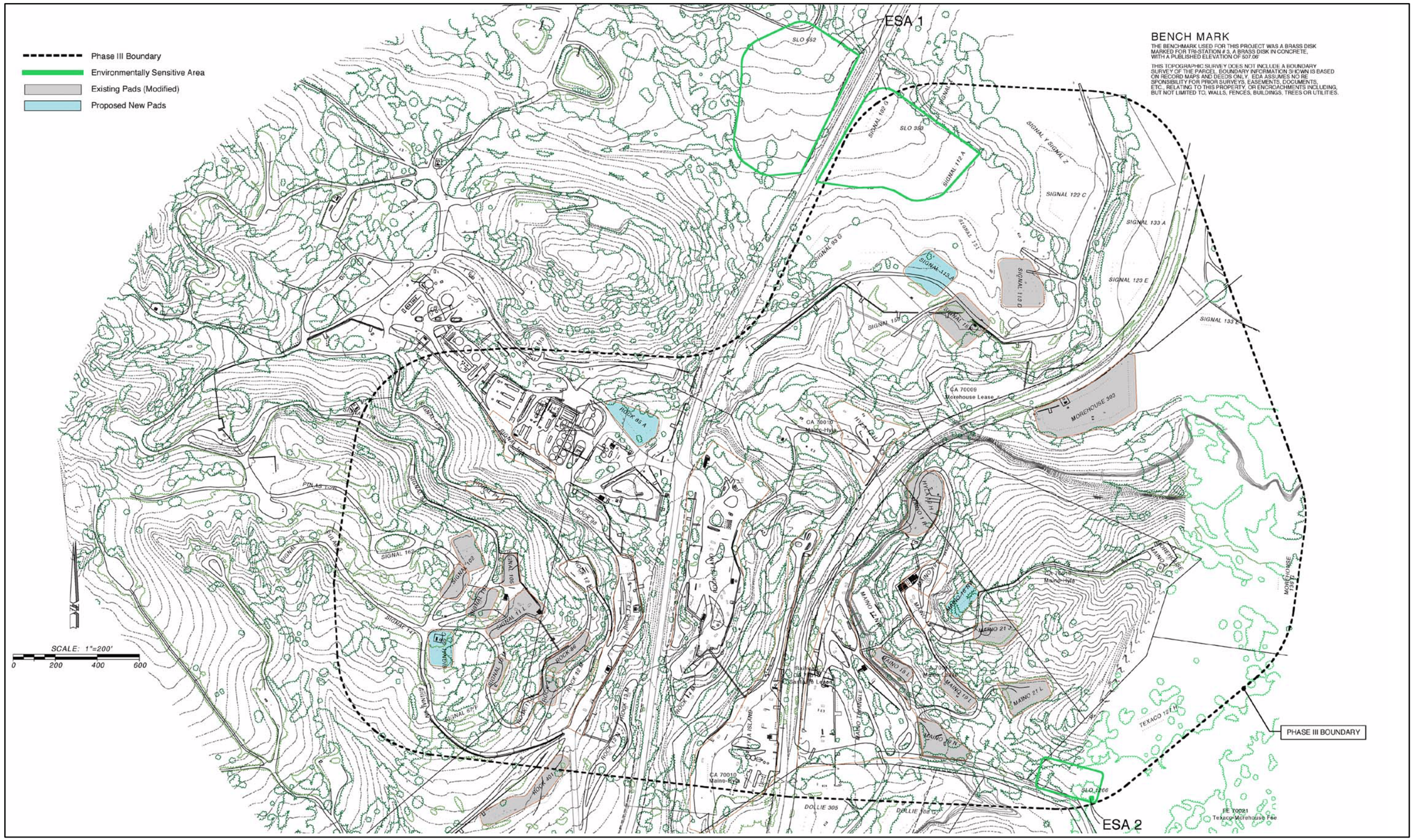
PXP Phase IV Develoment Plan EIR

PHASE IV PROJECT AREA

FIGURE 3-5



Source: EDA Engineering Development Associates

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EXISTING AND PROPOSED NEW WELL PADS

FIGURE 3-6

The applicant may construct up to five water injector wells outside of the Phase III and Phase IV boundary area. Every effort would be made to locate these wells on existing graded pads with access by existing roads within the oil field, which would require only incidental grading and vegetation disturbance. If necessary to optimize production, some or all of the wells may be located in undeveloped areas (new pads). It is anticipated that, if required, these new well pads would not exceed 20,000 square-feet (approximately 0.5 acres) in area per pad. In either case, priority would be given to selecting sites that minimize potential impacts to biological and visual resources of the project area.

Construction of these wells will require a separate discretionary authorization. Specific information regarding the location of the wells and assurances that all conditions of approval for the Phase IV project have been met will be required prior to authorization.

Wherever possible, "in fill" drilling or twinning will occur where existing well pads will be used for new well sites so that more than one pumping unit can be safely and economically placed on the pads. Common drilling depths will range from 500 to 1,500 feet.

3.4.3.2 Steam Generators

As part of the Phase IV Project, PXP proposes to construct an additional 3 steam generators, previously analyzed in the 1994 EIR and approved by the SLOPC[2]. The generators will not be needed until after the drilling program is complete, and therefore their construction does not overlap the well drilling program, minimizing air emission impacts. These additions will meet SLO APCD New Source Review rules. The new generators will be constructed as needed, and will be grouped in one of two possible locations, adjacent to existing generators. The generators will consist of prefabricated equipment that will be installed on existing sites. No excavation or grading will be required.

The proposed generators will be fitted with low nitrogen oxide burners, which will effectively reduce nitrogen oxide emissions.

For the new steam generators, there would be a new water line and a utility gas line linking PXP's main facility on the property with the new steam generator site. These two lines would be placed in the existing pipeline corridor that crosses Price Canyon Road. There would also be up to 200 feet of pipeline installed to link the steam generator site to the existing pipeline corridor. Similar to the flowlines for the wells, this pipe would be suspended above ground by individual hangers or by group racks to minimize ground disturbance.

3.4.3.3 Produced Water Management

Water for the proposed project would come from existing sources: three groundwater wells on the property, and water recovered during the production of the oil (produced water). Some additional facilities (water softening, water treatment, tankage and appurtenances) will be required to treat the increased amount of produced water. The three fresh groundwater wells currently provide water only for landscaping and plumbing; this practice would not change with the proposed project.

[2] These three steam generators are not in addition to the ones previously analyzed in 1994 EIR and previously approved by SLOPC.

Table 3.4-2
Well Pad and Well Information

Well Pad Location	Code	New Existing	Disturbed (AC)	# of New Wells
Hyla 17H	H17H	E	0.0	6
Hyla 19H/Maino 1	H19H	E	0.26	3
Hyla Island	HI	E	0.0	5
Maino 16NW	M16NW	N	0.45	4
Maino 17NW	M17NW	E	0.0	2
Maino 18J	M18J	E	0.0	5
Maino 18L (Maino 19L01, Maino 18SIL, Maino 15	M18L	E	0.09	2
Maino 19J	M19J	E	0.0	4
Maino 19L (Maino 19SPL)	M19L	E	0.11	1
Maino 19N	M19N	E	0.34	5
Maino 21J	M21J	E	0.39	2
Maino 21L (Maino 16)	M21L	E	0.52	1
Maino Triangle	MT	E	0.0	5
Morehouse 303	MH303	E	0.76	20
Rock 4	R4	E	0.08	1
Rock 11N	R11N	E	0.0	1
Rock 12K	R12K	E	0.0	2
Rock 12M	R12M	E	0.0	4
Rock 13L	R13L	E	0.0	3
Rock 85A	R85A	N	0.84	6
Rock 86	R86	E	0.04	1
Rock 401	R401	E	0.5	2
Rock Island	RI	E	0.0	5
Signal 10M	S10M	E	0.03	1
Signal 11L	S11L	E	0.3	2
Signal 66C	S66C	N	0.52	2
Signal 101 (Signal 9LI)	S101	E	0.01	1
Signal 102 (PG 406.5)	S1026	E	0.13	1
Signal 102 (PG 408.5)	S1028	E	0.18	1
Signal 105 (Signal 10-5L)	S105	E	0.02	1
Signal 106	S106	E	0.0	2
Signal 113A	S113A	N	0.87	1
Signal 113D	S113D	E	0.18	7
Signal 150	S150	E	0.0	10
Signal 151	S151	E	0.28	4
Signal P1-I1	SP1	E	0.0	2
Total Acres			**6.9**	**125**

Note 1) Injection wells are included in the # new wells column and represent 30 of the total 125 wells being proposed.

The increased amount of produced water due to greater oil production that is not used for the steam generators would be sent to the flotation cell and sand filters to remove entrained oil and then reinjected through waste water injection wells to approved subsurface disposal zones as per California Division of Oil, Gas, and Geothermal Resources (DOGGR) requirements.

3.4.3.4 Tank Battery Facilities

Current tank batteries are sized to accommodate the new production.

3.4.3.5 Vacuum Pipeline System, Flow Lines, and Vapor Recovery System

Wells drilled from new locations (i.e., those not directionally from existing wells) would have new, above-ground, 2-inch oil and gas (casing gas recovery) flowlines that connect the well to the existing pipeline corridors on the property. The length of these flowlines would be approximately 1,000 feet per well. The flowlines would be suspended above ground by individual hangers or by group racks. Consequently, the installation of the flowlines would disturb only a small area, approximately 10 square feet per well. The only disturbed area associated with the flowline installation would be those needed for the pads, for each hanger, or group rack. It is assumed that they would be placed in the same right-of-way as existing and new access roads to the maximum extent feasible.

It should be noted that there would be no new pipeline corridors built for the proposed project (including the new wells). Only the well flowlines, as described above, would be constructed[3]. In addition, no new access roads would be constructed. Instead, existing access roads would be used to the maximum extent feasible.

Production from the new wells would be handled by the existing dehydration facilities located on the west side of Price Canyon Road (see Figure 3-5). Some additional connector pipelines would be necessary to connect new well locations to the existing corridor of conductor pipelines. The location of these connector pipelines will be alongside existing roads and disturbed areas to the extent feasible. No pipeline burials are required for the proposed project.

3.4.3.6 Public Utilities

A cogeneration facility is currently being built which will provide 1.4 Mega Watts (MW) and supplement the expected ultimate electrical demand of 2.8 MW. PG&E will provide the balance of the electrical needs.

3.4.3.7 Employment

Construction of most of the oil facilities is typically contracted to local drilling and construction firms. It is expected that PXP's existing workforce will be adequate to operate and maintain the new wells and facilities. Periodic long-term maintenance and call-out work will be performed by contract help.

3.4.3.8 Oil Transport

Oil will be transported by tanker truck to the Conoco-Philips Battles pump station in Santa Maria. It is estimated that an additional 25 truck trips per day will be required to transport the new production. The Traffic and Circulation Study (see Appendix C) prepared by Associated

[3] A "pipeline corridor" is a grouping of several large pipelines that would typically disturb vegetation along the entire pipeline route; well flowlines are not considered pipeline corridors.

Transporation Engineers, (December 2001), evaluates the potential traffic impacts. Based on this analysis, the level of service (LOS) on Price Canyon Road is not anticipated to be impacted. See Section 5.2 for a detailed discussion.

3.5 CONSTRUCTION CONSIDERATIONS

3.5.1 Schedule of Completion

Construction would begin upon approval by the County of San Luis Obispo and would occur periodically for 36 or more months, with most activity concentrated in the summer months. If PXP drills 40 wells per year, the earliest the project would be completed is summer of 2007, when the last 5 wells would be drilled. The drilling of the new wells may extend beyond that date and depends on rate of production. Currently, each existing well produces about 15 barrels of oil per day, requiring about 75 barrels of steam (assuming an OSR of 0.32), and each generator can produce about 3,000 barrels of steam per day. Each generator is capable of supporting an average of 40 new wells given existing geological formations. Thus, with each incremental increase of 40 wells, a new steam generator will be added.

However, as heat accumulates in the oil produced over the life of the project, two important changes will occur. First, the amount of oil produced from each well will increase. PXP expects that the average well production will increase over time from the current average of 15 BOPD. The second change will be that the steam required to produce a barrel of oil will drop. This will be observed as an increase in the OSR. The average OSR may increase from the current average of 0.32. As the OSR increases, each steam generator will be capable of supplying a larger number of wells with steam.

3.5.2 Land Preparation

Land preparation for increased production will entail clearing and grading for four new well pad sites, construction of berms or dikes around the pads for emergency oil containment, and cleanup and landscaping. The proposed project utilizes existing pads for 90% of new wells. The four new pads will require 2.68 acres of ground disturbance. Minimal to moderate grading is required on the 17 existing pads cumulatively totaling about 4.22 acres. Existing generator sites will be used for the three new steam generators. No new access roads or ancillary equipment sites will be required.

3.5.3 Order of Construction

As a worst-case scenario, it is assumed that well pad construction and well drilling activities would occur simultaneously, with the exception of the construction of the three new steam generators as previously noted. This overlap would be the most rigorous construction schedule, and thus represents a high estimate for motor vehicle trips generated during construction. Well pad and flow line installation will not occur in the same quarter as well drilling to reduced air emissions associated with construction.

3.5.4 Equipment and Usage

Construction of well pads, flowlines and other appurtenances would occur during four 10-hr days from 7:00 a.m. to 4:00 p.m. Construction crews would be departing the premises during the p.m. peak hour (see *Traffic and Circulation Study*, 2001 – Appendix C). Construction related deliveries (e.g., pipe, concrete, etc.) are estimated at a maximum of two per day. Construction of the additional steam generators will occur outside the peak construction period

(the Traffic and Circulation Study assumes no generator construction which is consistent with construction occurring outside of the peak period). The construction crew would consist of up to 22 people.

Drilling would occur 24 hours per day. Drilling personnel would work two 12-hour shifts, with six workers per shift (i.e., 12 people total). Shift changes for the drilling crews would occur at 11:30 A.M. and 11:30 P.M. Other vehicle trips would include trucks delivering supplies to the site. It is estimated that a maximum of 22 such deliveries during drilling would occur each day.

Disposal of the muds and cuttings would follow current practices which include onsite beneficial use of non-hazardous material as well as offsite disposal on an exception basis. Beneficial use consists of using the non-hazardous material to form berms around the perimeter of well pads near Pismo Creek. Formation of such perms prevents migration of material into the creek. Peak vehicle trips are estimated at 30 during the p.m. period. Estimates of equipment and personnel requirements during construction are summarized in Table 3.5-1.

3.6 OPERATION AND MAINTENANCE CONSIDERATIONS

The earliest that the operational phase of the project would begin is January 1, 2004. The existing operation employs 30 people and it is anticipated that no additional operations personnel will be required to facilitate the proposed oil field expansion. The expanded operation would not require any additional truck trips to deliver supplies beyond the number required by the existing operation.

Table 3.5-1a
Construction Considerations

Equipment	Fuel Type D=Diesel G=Gasoline	Power Rating[1]	Number Active	Load Factor[1]	Hours Used per Day	Total Days of Construct.
Well Pad Construction						
D-8 Cat Dozer	D	285	1	.5	8	22[2]
12-G Cat Motor Grader	D	135	1	.5	8	22[2]
Water Truck	D	185	1	.5	8	22[2]
Compactor	D	185	1	.8	4	22[2]
Flat Bed Truck – Mud Cuttings	D	185	1	.4	8	22[2]
Pickup Truck	D	185	1	--	8	22[2]
Well Drilling						
Draw Works/Rotary GM 671N	D	215	1	--	4.37[3]	185[4]
Mud Pump GM 671N	D	225	1	--	4.05[3]	185[4]
Generator GM 671N	D	205	1	--	7.14[3]	185[4]
Mud Cleaner GM 271	D	56	1	--	4.04[3]	185[4]
Conductor Pipe						
Hole Digger	D					
Truck Engine	D	185	1	--	1	65
Winch	D	100	1	.7	8	65
580 Cat Backhoe	D	55	1	.7	3	65
Pickup Truck	D	185	1	--	1	65
Piping & Other Construction						
Welding Truck	D					
Truck Engine	D	185	2	--	1	185[5]
Welding Machine	D	70	2	.7	8	185[5]
HydroCrane	D	185	1	.5	8	185[5]
580 Cat Backhoe	D	55	1	.7	3	185[5]
Electrical Line Truck	D	185	1	--	1	185[5]
Pickup Truck	G	185	3	--	1	185[5]
Inspection Services						
Light Duty Truck	G	145	1	.4	8	103[6]

Notes:

1. Power Rating and Load Factors: Same as 1994 EIR, Table A-1
2. 18 existing and 4 new well pads constructed at average of 1 day per well pad (new pads take 3-4 days, existing pads take half-day or less.
3. Well Drilling Hours Used per Day: Same as 1994 EIR, Table A-1
4. Well Drilling durations: 4 days/producing well, 1 day/injection well
5. Duration of piping and other construction coincides with length of drilling program
6. Inspection services only needed during Steam Generator construction

Table 3.5-1b
Construction Considerations - continued

Equipment	Fuel Type	Power Rating1	Number Active	Load Factor1	Hours Used per Day	Total Days of Construct.
Steam Generator Site Preparation[2]						
Welding Truck	D					
Truck Engine	D	185	4	--	1	103
Welding Machine	D	70	4	.7	8	103
HydroCrane	D	185	1	.5	8	103
580 Cat Backhoe	D	55	1	.7	3	103
Pickup Truck	G	185	3	--	1	103

Notes:

1. 3 Steam Generators permitted in Development Permit No. D910026D, but not yet built. They will be constructed after 2006, outside of peak construction period.
2. Power Rating and Load Factors: Same as 1994 EIR, Table A-1

CHAPTER 4.0
LAND USE POLICY CONSISTENCY

This chapter is intended to provide the reader with background information regarding the general community setting of the proposed project, as well as information concerning the current land uses, proposed land uses, and land use policies in the vicinity of the project site. Section 15125 of the CEQA Guidelines states that "the EIR shall discuss any inconsistencies between the proposed project and applicable general plans and regional plans."

To analyze land use consistency and land use impacts, the following approach was employed: (1) the proposed project was reviewed relative to the land use assumptions, policies and designations of the San Luis Bay Inland Area Plan Land Use Element and Circulation Element, San Luis Obispo County Framework for Planning (Inland), San Luis Obispo Energy Element, San Luis Obispo Agriculture & Open Space Element, and the San Luis Obispo County Land Use Ordinance, and (2) the proposed uses of the plan and alternatives were reviewed to identify any potential conflicts between the planned project and existing and proposed land uses in the vicinity. In some instances, a plan or land use inconsistency also poses environmental consequences, such as impacts on sensitive habitats. In these cases, the environmental consequences of the proposed project are identified in this chapter, but discussed in greater detail in the specific chapter of this EIR that focuses on that issue.

4.1 PHYSICAL SETTING

4.1.1 Regional Setting

The project vicinity is Price Canyon, which is a distinct rural area located approximately 2.5 miles northeast of the City of Pismo Beach. Price Canyon is located in the San Luis Bay Inland Planning Area, which encompasses the south central coastal portion of San Luis Obispo County, extending from and including most of Montana de Oro on the north to the Nipomo Mesa on the south, inland as far as Highway 227 and Orcutt Road northeast of Arroyo Grande. This includes the non-coastal zone portions of the "Five Cities" urban areas of Pismo Beach, Grover Beach, Arroyo Grande, Oceano and Halcyon, the Avila Beach area outside of the coastal zone, as well as remaining agricultural and rural lands. This planning area encompasses 61,018 acres or 95 square miles. The San Luis Bay Inland Planning Area and the Phase IV Boundary are shown on Figure 4-1.

4.1.2 Project Location

The project is located in the Arroyo Grande oil field in Price Canyon. Specifically, the proposed activities will affect areas within the Phase IV Development Area, as shown in Figure 4-1. The project site is located outside of an urban or village reserve line (approximately ¼ mile).

4.1.3 Site Characteristics

This project area is approximately bisected by Pismo Creek, which occupies the floor of Price Canyon. This area is characterized by rolling terrain with a pronounced ridge to the west, Tiber Hill to the east, and a cliff-lie ridge to the northwest. The elevations of these geographic features are 607, 506 and 442 feet above seas level, respectively, and are separated by valleys at elevations of approximately 200 feet above sea level. Vegetation includes grasses, forbs, chaparral, oak woodland, Edna manzanita, and non-native vegetation. Elevations on the site

range from a high of 607 feet above sea level in the northern segment of the site to approximately 100 feet above sea level on the east side of the site within the Pismo Creek drainage. Geologic hazards include a moderate landslide potential.

The fire hazard rating is “high". Water is provided by three onsite wells and sewage disposal by an onsite septic system. Existing oil field equipment is present over the entire project site. Surrounding land uses include grazing and scattered residential development.

4.2 LAND USES IN THE AREA OF IMPACT

The proposed Phase IV project comprises a portion of PXP’s 1,450-acre Price Canyon Unit. The existing use of the project area is crude oil production field, and the only land use surrounding the area is grazing. Cold Canyon Landfill is in the vicinity of the project, approximately 1 mile to the east. The preferred alternative would involve expansion of PXP’s existing operations by addition of 95 production wells, 30 injection wells, 3 steam injectors, 4 well pads, and modification of 31 existing well pads.

4.3 ADOPTED PLANS AND POLICIES GOVERNING THE AREA

The 320-acre Arroyo oil field area, which is within the larger Price Canyon Unit (approximately 1,480 acres), falls within the San Luis Obispo County General Plan and the associated Land Use Ordinance. The land use impacts of the project are evaluated in terms of the project’s consistency with five county planning documents: (1) the *San Luis Obispo County General Plan*, (2) the *Land Use Element* of the *San Luis Obsipo County General Plan* (General Plan), (3) the accompanying *Land Use Ordinance, (4) the San Luis Obispo County Energy Element, and (5) San Luis Obispo County Agriculture and Open Space Element*.

4.3.1 San Luis Obispo County General Plan

State law requires that the County have a General Plan with goals, policies, and programs that regulate the use of land in the unincorporated areas of the County. The San Luis Obispo County General Plan governs land use within unincorporated communities and surrounding areas. The plan is composed of several parts or elements:

- Land Use*
- Circulation* (sometimes combined with land use)
- Housing*
- Conservation*
- Agriculture and Open Space*
- Safety*
- Noise*
- Historic
- Recreation
- Energy
- Offshore Energy

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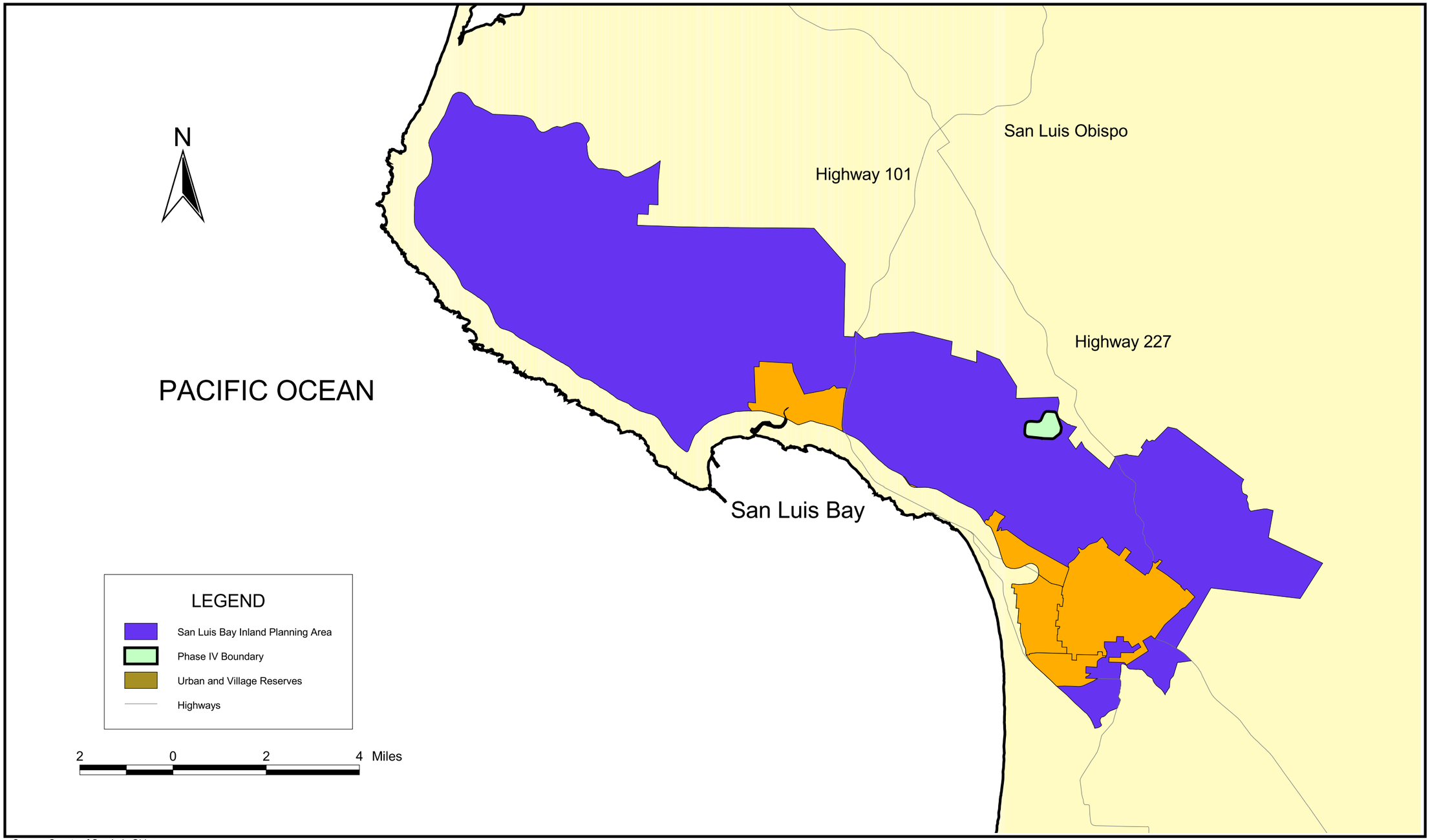

Source: County of San Luis Obispo

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SAN LUIS BAY INLAND PLANNING AREA

The elements followed by a "*" are those required by state law. The law also allows the adoption of optional elements of the general plan to address specific issues that may not be covered in sufficient detail by the other elements. The historic, recreation, offshore energy, energy and agriculture and open space elements are optional. The Energy Element and Agriculture & Open Space Element of the San Luis Obispo County General Plan are discussed in more detail in Section 4.3.4 and 4.3.5, respectively.

Land Use Element and Local Coastal Plan. The Land Use Element (LUE) and Local Coastal Plan establish the overall policies for land use in the unincorporated county for both inland and coastal areas. The LUE is composed of four sections: framework for planning, the area plans, the coastal program policy document, and the official maps.

Framework for Planning. This section of the land use element contains policies, programs and procedures that apply countywide, and it explains how the LUE is to be used with other adopted plans. The framework section also describes the various land use categories that apply to the unincorporated county, the allowable land uses within each category, and typical building intensities (parcel sizes, population, and building densities). There is also a coastal framework for planning that describes the policies, programs and land use categories that apply to lands within the coastal zone.

Area Plans. The land use element includes 15 area plans that address specific land use issues affecting the unincorporated communities and regions within the county. The area plans supplement and refine the general goals, policies and programs contained in the framework section and help to make the planning process more localized. The area plans describe where the land use categories are to be applied and discuss population growth and economic conditions, public services, and circulation. Since the project site is located in the planning area called San Luis Bay Inland, the area plan for the project area is the San Luis Bay Inland Area Plan.

Official Maps. The official land use maps illustrate where the various land use categories are to be applied in the unincorporated county. Each area plan contains land use maps that provide more detailed illustrations of where the land use designations are applied.

The Land Use Element of the General Plan describes County policy on the location, distribution, and extent of land use throughout the County. It consists of two volumes: (a) Framework for Planning, and (b) Area Plans. The area plans refine the general policies in the Framework for Planning into separate land use issues and policies for each community. The Land Use Ordinance is a regulatory tool for implementing policies for each community. Thus, it helps guide land use in manner that supports orderly development. The Energy Element and Agriculture and Open Space Element are components of the County General Plan.

4.3.2 San Luis Bay Inland Planning Area Plan

Adopted in 1994, the plan contains both a land use element and circulation element, which have a number of policies and standards for the planning area. It prescribes land use policies for the San Luis Planning Area, including regulations that are also adopted as part of the Land Use Ordinance. This area plan allocated land use throughout the planning area by land use

categories (zoning) that determine what kinds of uses of land can be established. There are 11 land use categories:

- AG – Agriculture
- RL – Rural Lands
- RR – Residential Rural
- RS – Residential Suburban
- RSF – Residential Single Family
- RMF – Residential Multi-Family
- CR – Commercial Retail
- CS – Commercial Service
- IND – Industrial
- REC – Recreation
- OS – Open Space

Figure 4-2 shows such designations, based on *Official Maps*, within the Phase IV Boundary. These designations determine the variety of land uses that may be established on a parcel of land, as well as defining their allowable density and intensity.

The diverse environmental and built features of San Luis Obispo County create a need for more careful review of development projects in areas where new development could adversely affect sensitive resources or result in the exposure of people or property to natural hazards. For this reason, the land use element contains combining designations that identify areas with characteristics that are either of public value or are natural hazards. The combining designations are applied to the basic land use designations in the unincorporated county as described in each area plan.

Specific development "standards" are also defined by the plan to address special problems and conditions in individual communities. Applicable to this project, as an oil development project, are the policies relating to "Combining Designations", which are special overlay land use categories applied to areas with potentially hazardous conditions or significant natural resources.

There are nine combining designations in the land use element (Figure 4-3 shows the combining designations within the project vicinity):

- AR – Airport Review
- EX – Energy/Extractive Area
- EX1 – Extractive Resource Area
- FH – Flood Hazard
- GSA – Geologic Study Area
- H – Historic Site
- SRA – Sensitive Resource Area
- TDCS or TDCR – Transfer Development Credits – Sending or Receiving

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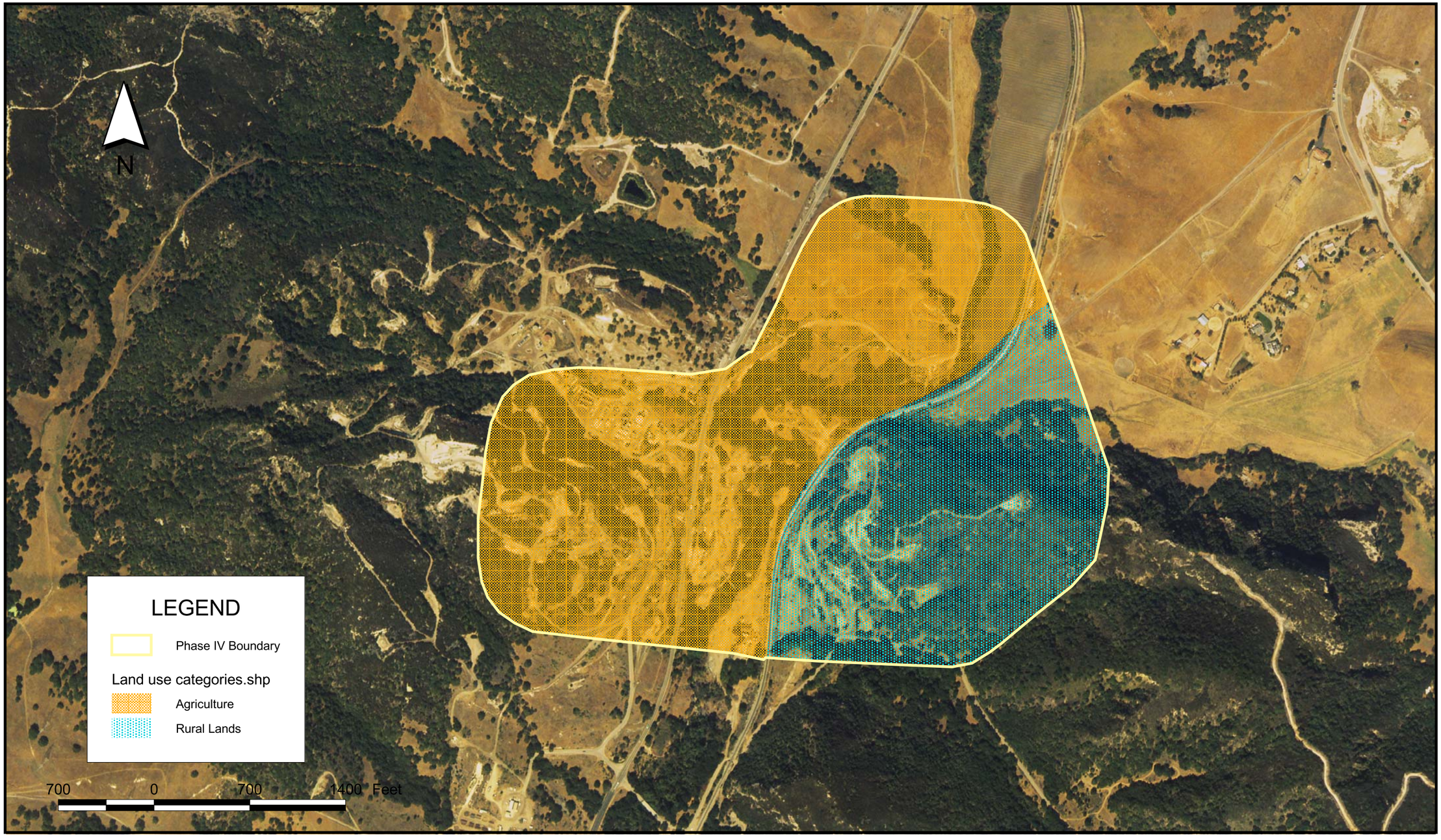

Source: County of San Luis Obispo

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PXP Phase IV Development Plan EIR

LAND USE CATEGORIES IN PROJECT AREA

FIGURE 4-2

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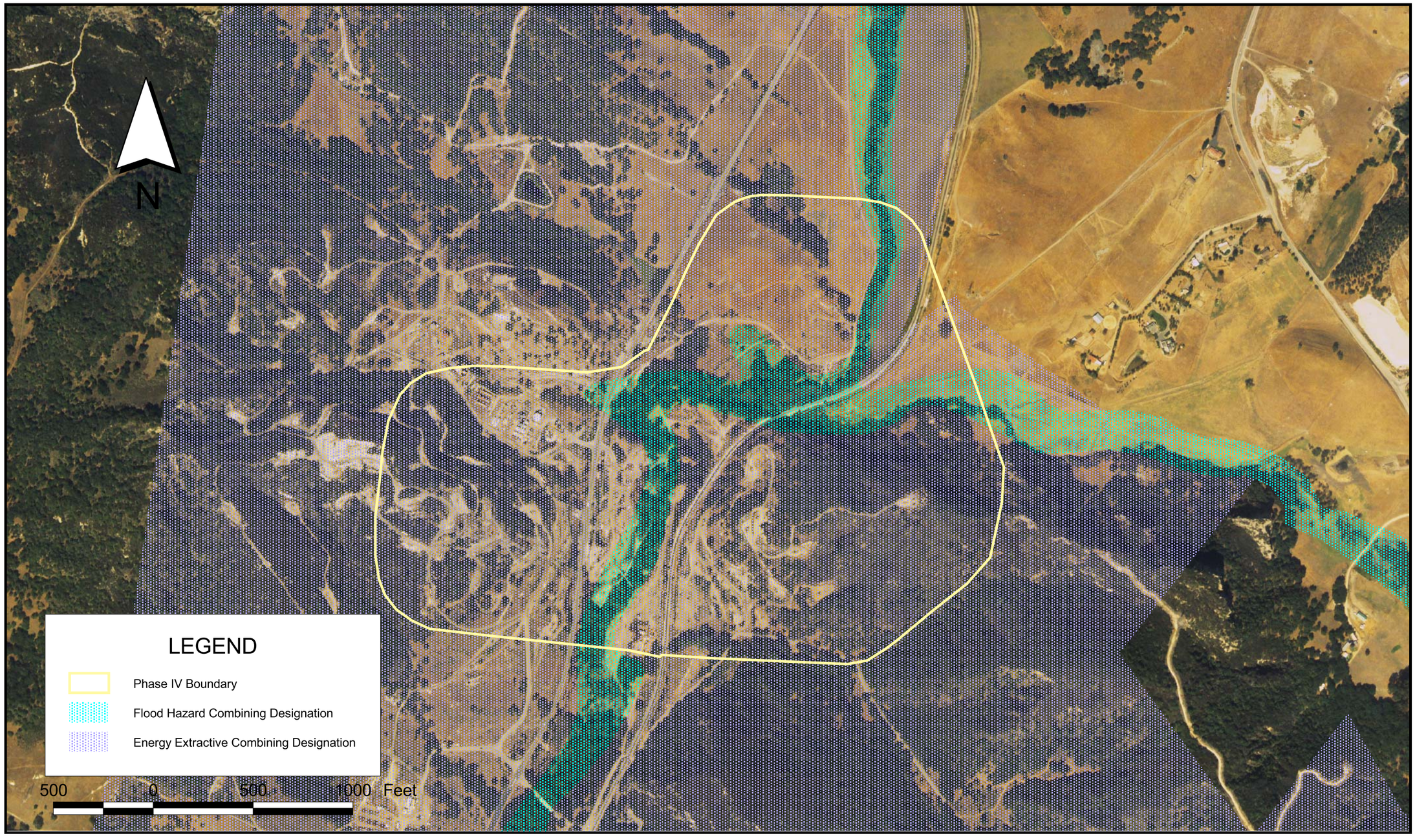

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COMBINING DESIGNATIONS IN PROJECT AREA

4.3.3 County of San Luis Obispo Land Use Ordinance

County of San Luis Obispo Land Use Ordinance lists standards (requirements) and permit procedures for developing land. These standards include features of site design, such as minimum parcel size, the required width of yards (setbacks), the height of buildings, and the number and design of parking spaces, as well as standards for grading, drainage, curb and gutter improvements, and tree removal.

4.3.4 County of San Luis Obispo Energy Element

The purpose of the Energy Element is to: (1) increase energy efficiency in the County, (2) provide policy guidance regarding the implications of energy use, (3) document the County's energy resources, (4) determine land use and environmental criteria for evaluating future energy projects, and (5) provide alternatives which encourage exceeding the State's energy regulations for new construction. It contains specifics policies regarding fossil fuel production, including pumps, wells, refineries, pipelines, and marine terminals.

4.3.5 County of San Luis Obispo Agriculture & Open Space Element

The purpose of the Agriculture & Open Space Element is to: (1) identify those areas of the county with productive farms, ranches and soils, and establish goals, policies and implementation measures that will enable their long-range stability and productivity, and (2) identify open space lands that are worthy of protection for their intrinsic value, and establish goals, policies and implementation measures that will enable the long-term protection of those resources.

4.4 ANALYSIS OF IMPACTS RELATED TO LAND USE AND PLAN CONSISTENCY

4.4.1 Thresholds of Significance

Based on the mandatory findings of significance criteria of Section 15065 and Appendix G of the State CEQA Guidelines (Governor's Office of Planning and Research, 1999), an impact would be significant if any of the following conditions, or potential thereof, would result with implementation of the proposed projects:

1. Physically divide an established community;
2. 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.
3. Conflict with any applicable habitat conservation plan or natural community conservation plan;
4. Have a substantial impact on a scenic vista;
5. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings and historic buildings within a state scenic highway;
6. Substantially degrade the existing visual character or quality of the site and surroundings; and,

7. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

4.4.2 Impact Categories

Short-term and long-term impacts are analyzed. Each impact statement is classified as to the level of significance, based on the significance thresholds, and the availability of measures to feasibly mitigate project effects. Impact categories include:

Class I. Significant unavoidable adverse impacts that cannot be mitigated. A Class I impact is one for which a solution has not been formulated, either because of the limits of technical and/or scientific knowledge, or unfeasibility from a technical, economic, and/or political perspective. Under CEQA, a Class I impact would require a "finding of overriding consideration" by the County to approve the project.

Class II. Adverse environmental impacts that can be mitigated to less than significant levels. Measures have been identified that can feasibly be implemented and will avoid the impact altogether by not taking a certain action or parts of an action; minimize impacts by limiting the degree or magnitude of the action and its implemented; rectify the impact by repairing, rehabilitating, or restoring the affected environment; or compensate for the impact by replacing or providing substitute resources or environments.

Class III. Adverse environmental impacts that are less than significant or have no identified impact. These impacts, while adverse, are not of a sufficient magnitude, intensity, or duration to disrupt the environment, and have no serious consequences. As a result, no mitigation is required.

Class IV. Beneficial impacts benefit or improve the environment and no mitigation is required.

4.4.2.1 Project Impacts

Impact LND-1. Physically divide an established community.

> **Discussion:** The proposed project will take place within an existing oil field development area that has been in operation for nearly 100 years. The project area is located outside of an urban or village reserve line. The nearest community is the City of Pismo Beach, which is located over 1 mile from the project site. The proposed activities are consistent with current uses and will not physically divide an established community. This impact is considered less than significant.
>
> **Impact Category**: Class 3
>
> **Threshold of Significance**: 1
>
> **Mitigation Measure**: No significant impacts were identified; therefore, no mitigation is necessary.

Impact LND-2. Compatibility with San Luis Obispo County Land Use Categories

> **Discussion**. The project is located in the San Luis Bay Inland Planning Area. The applicable land use categories for the project site are Agriculture and Rural Lands, and the combining designations for the area are Energy and Extractive Uses and Flood Hazard (Pismo Creek). The land use categories are discussed below, while the

requirements of the combining designation (since they are expressed in the form of policies) are discussed in the following section.

The project site includes two land use categories: Agriculture and Rural Lands. Petroleum extraction, the proposed land use of the Phase IV expansion, is allowed in both of these land use categories according to the Framework for Planning. Such use is subject to special standards or permit procedures described in the Land Use Ordinance section 22.08.170 (Resource Extraction).

The Area Plan states under the description of the land use category Rural Lands (Chapter 6, Section A, page 6-2) that:

> *Extraction operations must be performed in a manner that will stress re-use of the land, and protect the visual quality to the maximum extent possible. Development proposals for open pit mining to extract oil from the surface geology would not be appropriate.*

Since the only surrounding land use is grazing, re-use of the project site would most likely comprise grazing. The project is potentially consistent with eventual re-use of the area for grazing, provided that grasses for grazing could be re-established on the site.

The visual quality of the site is already disturbed from existing oilfield operations. Adding 3 new steam generators, modifying 31 existing well pads and creating 4 additional ones, and adding 95 new producer wells and 30 injector wells would result in less than significant visual impacts (see Section 5.3). Mitigation measures provided for biological impacts would minimize visual impacts as well (see Section 5.3 and 5.5).

Unlike the above policies for Rural Lands in the project area, the Area Plan includes no policies that apply specifically to the land use category Agriculture in the project area.

Impact Category: Class 3

Threshold of Significance: 2

Mitigation Measure: No significant impacts were identified; therefore, no mitigation is necessary.

Impact LND-3. Consistency with the County of San Luis Obispo General Plan Land Use Element and San Luis Bay Inland Area Plan.

Discussion: The principal policies to which the project is subject are described in the Land Use Element of the County's General Plan. These are contained in the San Luis Bay Inland Area Plan, which covers the project area. The applicable policies from this document include the requirements of the combining designations, and planning area standards. The project's consistency with these requirements is discussed below.

Requirements of the Combining Designation Energy and Extractive Uses

The San Luis Bay Inland Area Plan notes that the Price Canyon/Ormonde Road Oilfield has the combining designation of Energy and Extractive Uses (sometimes called Energy and Extractive Areas), and states (Chapter 7, Section A, page 7-2):

This designation includes those areas shown as Rural Lands. These operations should not be expanded into adjacent land use categories or existing operations intensified without full review through a public hearing process. The scenic value of Price Canyon should also be protected as an entry to the City of Pismo Beach.

The areas of the proposed Phase IV expansion is contained entirely within PXP's Price Canyon Unit, which, as noted above, includes the Rural Lands and Agricultural land use categories. Since petroleum extraction is allowed within these two land use categories and since the Phase IV area would not encroach upon any other land use categories, the proposed project is compatible with existing land uses and is, therefore, consistent with this portion of the objective noted above. This project will require a Conditional Use permit from the County, which will be subject to a public hearing.

The project is also potentially consistent with the objective of preserving the scenic value of Price Canyon. The project represents only an incremental expansion of the existing oilfield operation. As such, the project is consistent with the existing development of the site. Also, much of the project would not be visible because of the rolling terrain of the area. For these reasons, the project would not noticeably detract from the scenic quality of Price Canyon. As shown in Figure 4-3, the project site is not located in the Pismo Beach Hillsides Sensitive Resource Area (SRA)[1].

Requirements of the Combining Designation Flood Hazard

The San Luis Bay Inland Area Plan also notes that Pismo Creek, which runs through the middle of the Phase IV area, has the combining designation of Flood Hazard, and states (Chapter 7, Section B, page 7-2):

These drainage courses should be maintained in their natural state and native vegetation and habitats retained.

The proposed project activities will occur entirely within the Phase IV project boundary. As shown in Figure 4-4, Pismo Creek runs directly through the middle of the project area. However, the project represents only an incremental expansion of the existing oil field operation, and a 100-foot buffer from the creek will be observed for project activities (see Figure 4-4). By observing this exclusion zone, Pismo Creek will be maintained in its natural state and native vegetation and habitats of the creek will be retained. (See Section 5.5 for additional discussion)

The Framework for Planning discusses (Chapter 7, Section A, page 7-9 and 7-10) the general objectives for the combining designation called Energy and Extractive Area (designated "EX").

[1] This combining designation imposes specific requirements for oil and gas production facilities, including a visual analysis demonstrating that the project complies with site development standards.

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Project No. 0202-2721

Source: County of San Luis Obispo

padre associates, inc.
ENGINEERS, GEOLOGISTS & ENVIRONMENTAL SCIENTISTS

PXP Phase IV Development Plan EIR

PISMO CREEK AND 100-FOOT BUFFER

FIGURE 4-4

1. *Following approval of an energy or resource extraction project, the County should initiate an amendment to the Land Use Element to apply this combining designation to the property to ensure compliance with the applicable standards of the Land Use Ordinance (Ord. 2498, Amended 1991).*

   The appropriate combining designation (Energy and Extractive Uses) has already been applied to the project area.

2. *Extraction operations and energy facilities should be provided with adequate buffering and screening from adjacent land uses.*

   Since the project would increase the intensity of oil development entirely within a much larger area (1,450 acres) already developed to this purpose, buffering and screening from adjacent land uses is already present to some degree. However, as discussed under visual impacts (Section 5.3), some elements of the proposed project will be visible from both Price Canyon Road and several residences on a bluff top about three-quarters of a mile to the northwest. Due to intervening topography and existing vegetation, adequate buffering and screening is currently present.

3. *Applications for proposed extraction operations should include plans for preserving the long-term productivity of the site as well as site restoration after termination of extraction operations.*

   Oil development has occurred on this site for nearly one hundred years. The project application does not include plans to preserve this long-term productivity or to eventually restore the site. This is probably because the applicant plans to continue oil development on the site for many years to come. The project is, therefore, potentially inconsistent with this objective.

4. *Extraction site access routes should not create nuisances or hazards for adjacent properties.*

   Access roads into the site from Price Canyon Road and Ormonde Road appear to be well maintained. The traffic analysis in this EIR (Section 5.2) recommends that warning signs be provided on Price Canyon Road prior to the construction phase to notify through traffic of large, slow-moving truck traffic entering and exiting the site. Since no other hazards associated with the project have been identified, the adoption of this mitigation measure would make the project consistent with this objective.

5. *Wherever possible, oil and gas drilling production, and processing should be in consolidated locations, rather than spread out over numerous sites.*

   The project would only increase oil development activities within an existing oil development area; it would not expand into other areas. Furthermore, oil produced under the expanded operations would be processed at the existing oil processing facilities. Therefore, the project is consistent with this objective.

6. *Exploratory gas and oil wells should be subject to review procedures separate from those for development/production operations.*

No exploratory wells are proposed as part of the project. The project includes only producer and injector wells; therefore, this objective is not pertinent to the project.

The San Luis Bay Inland Area Plan includes planning area standards. These standards are mandatory requirements for new developments in the San Luis Bay Inland Planning Area. The area plan states (Chapter 8, page 8-7) that, for Energy and Extractive Resource Areas, the planning area standard is:

> *Development Plan approval is required for any expansion of existing oilfield operations in Price Canyon, Tiber Canyon, and in the hills of Ormonde Road into adjacent land use categories.*
>
> The project would not expand oilfield operations into any adjacent land use categories, so this objective is not pertinent to the project.

The Area Plan includes two other planning area standards that, while not specific to Energy and Extractive Resource Areas, could still apply to the project:

1. *Sloping Sites. Except for lands in the Agriculture category east of Montana de Oro, Development Plan proposals for sites with varied terrain are to include design provisions for concentrating developments on moderate slopes, retaining steeper slopes visible from public roads undeveloped.*

2. *Undergrounding – Development Plan Projects. All projects requiring Development Plan approval are to provide for underground utilities unless the Planning Commission determines either that: the proposed development will be of low intensity or in an isolated location; or that supporting overhead utilities will not be visible from public roads; or that overriding operational, economic, or site conditions of the project warrant waiver of this requirement.*

   The proposed project would not require any new utility lines; the existing lines, which are above ground, would serve the expanded Phase IV project. Since no new utility lines are proposed, this standard would not apply to the project.

Impact Category: Class 2

Threshold of Significance: 2

Mitigation Measures: A mitigation measure is proposed for the one area in which the proposed project could be potentially inconsistent with land use plans and policies. The measure below could make the project consistent with an objective of the combining designation Energy and Extractive Area.

Mitigation Measure LND-3: As a condition of project approval, PXP shall, prior to construction, submit to the County for approval a plan to preserve the long-term productivity of the site and to eventually restore the site after oil extraction operations are completed. This shall include provisions to ensure eradication of exotic plant species (i.e., pampus grass, tree tobacco, etc.) within the dedicated easement and for controlling the spread of exotic species throughout the Phase IV expansion area.

Impact LND-4. Consistency with the County of San Luis Obispo Land Use Ordinance.

Discussion: Specific policies pertinent to onshore oil extraction are described in the *Land Use Ordinance* under Section 22.34.010, titled Petroleum Resource Development (last revised January 1, 2003). Subsections 22.34.030 (Drilling Permit Requirements), and 22.34.040 (Oil and Gas Well Development Standards) apply to the proposed project.

Section 22.34.030 (Drilling Permit Requirements) describes the permits necessary for exploratory wells and production wells. According to this section, both exploratory wells and production wells of the proposed project would require a County Conditional Use Permit. The Section also outlines the information required in such drilling permit applications. The drilling permit application should include the following:

1. The location and dimensions of wells, well pads and earthen sumps, location of roads and associated improvements (including housing), locations of any pipelines or storage tanks and pump facilities.
2. Identification of the type of drilling equipment (e.g., portable or fixed) intended to be used in the drilling activities.
3. When landscaping plans are required by Chapter 22.16, they shall include measures proposed for screening producing wells and permanent equipment from the view of public roads or residential uses, revegetation of all cut and fill banks, and restoration of disturbed areas of the site not directly related to oil and gas production.
4. Proposed erosion control measures.
5. All development associated with the proposed well and associated facilities and how that development complies with the standards of this Title.
6. The requirements and timing of any other agencies that must approve the project.

   The project has been substantially revised throughout the review process and the project now includes facility locations. The individual wells sites will undergo an additional more detailed site-specific review whenever the applicant applies for permits for each well. This detailed review will include submittal of specific landscaping and erosion control plans. Site-specific information is best handled at that time.

Section 22.34.040 (Oil and Gas Well Development Standards) describes standards in the following areas that apply to all resource extraction wells:

1. Performance guarantees (i.e., bonding: subsection A) to ensure that the project complies with all conditions of approval and other applicable regulations.
2. Site development (Subsection B), including; (1) roads, access, and site preparation, (2) clearing and revegetation, (3) well locations, (4) drilling within a community, (5) sumps and waste disposal, (6) fire protection, and (7) completion of drilling.

   Disposal of drill muds and cuttings is covered under subpart (5) above (sumps and waste disposal). This section states that all waste substances, such as drilling muds, oil, brine, or acids produced or used in connection with oil drilling operations or oil production shall be retained in watertight receptors, from which they can be piped or

hauled for terminal disposal in a dumping area specifically approved for such disposal by the Regional Water Quality Control Board. The applicant intends to comply with this requirement.

3. Well operation and site maintenance (subsection C), including (2) site maintenance, (4) parking and loading, (5) signing, (6) operating wells, and (7) violations. (Subparts 1 [landscaping] and 3 [storage tanks] of this subsection do not apply in Agriculture and Rural Lands categories outside urban and village reserve lines, and thus do not apply to this project.

   Subpart (2) above (site maintenance) addresses potential odors, which could occur from the proposed project. The part pertaining to odors states: *The site shall be maintained so as to prevent any accumulation of oil, oil products, oil coated board, materials, or equipment which might cause fumes or odors detrimental to adjoining property.*

4. Periodic inspections (Subsection D).

5. Well abandonment (Subsection E).

Required Permits. The principal land use permit for the proposed project is a Conditional Use Permit. Section 22.34.040(B)(1) of the *Land Use Ordinance* states that a grading permit may be required for site preparation and access roads to drill sites, as determine by *Ordinance* 22.52.070 (Grading). The new well pads, wells and steam generators, if approved, would be developed in phases through submittal of subsequent permit applications. The type of permit required for actual construction of each well and generator would depend on the location of the well and the extent of grading activities necessary for construction (including roads and drill pads). Minor Use Permits shall be submitted for activities in the "high" environmentally sensitive areas, grading permits shall be permitted for activities outside these areas, but still requiring some grading. A "Notice to Proceed" will be used for wells that are in areas of lower environmentally sensitivity and that require little or no grading. The purpose of this Notice to Proceed is to ensure that all conditions of project approval and mitigation measures for construction activities have been complied with prior to the actual start of well drilling. The Notice to Proceed will be necessary only in those areas where a Minor Use Permit and/or grading permit are not required. The project would have to comply with all applicable ordinances described above, as interpreted by the County of San Luis Obispo.

Impact Category: Class 3

Threshold of Significance: 2

Mitigation Measures: No significant impacts were identified; therefore, no mitigation is necessary.

Impact LND-5. Consistency with the County of San Luis Obispo Energy Element.

Discussion: Specific policies pertinent to fossil fuel production are described in the *Energy Element* under Chapter 5, titled Fossil Fuel Production (adopted April 25, 1995) apply to the proposed project. Table 4.4-1 lists the *applicable* polices contained with the Energy Element and provides a discussion of how the proposed project is consistent

with each of these policies. Overall, the project is consistent with the Energy Element. Therefore, no significant impacts will occur. The project would have to comply with all applicable policies described above, as interpreted by the County of San Luis Obispo.

Impact Category: Class 3

Threshold of Significance: 2

Mitigation Measures: No significant impacts were identified; therefore, no mitigation is necessary.

Table 4.4-1
San Luis Obispo County Energy Element

Policy Statement	Project Consistency Discussion
Policy 52. Proposed new or major additions to fossil fuel facilities must provide a sufficient buffer zone from existing or proposed human population, with special consideration given to those who cannot be quickly evacuated to safety, such as the disabled and elderly. To establish a buffer zone, a comprehensive risk analysis should be completed.	The proposed project will be within an existing oil producing area that is located approximately ~~2~~3 miles from Pismo Beach.
Policy 55. Guideline 55.1. A system safety review report shall be completed prior to approval of a proposed facility, or major addition to an existing facility. This report shall be completed by an objective third party, with all costs borne by the applicant. The report shall be reviewed by the safety review committee. The purpose is to evaluate the overall safety of the proposed facility and should include, but is not limited to, a review of past safety records, evaluation of current safety practices, analysis of maintenance and repair procedures and system testing procedures.	Section 5.10 – Hazards/Risk of Upset contains a review of the existing safety measures implemented at the project site.
Policy 55. Guideline 55.2. Regular monitoring and inspection of facilities shall be documented to ensure compliance with standards established as part of conditions of approval or an environmental quality assurance program. Project related conditions of approval shall be conspicuously posted and available at all times.	The applicant conducts routine monitoring and testing programs as part of regular operations of the facility. Copies of the results of these efforts have been submitted as part of this project.
Policy 55. Guideline 55.3. As part of the	The applicant conducts routine monitoring and testing

Policy Statement	Project Consistency Discussion
land use permit application, existing and proposed facilities should submit to the county monitoring and testing programs relevant to the project and the region being implemented, or proposed by the operator. The most recent test results for existing facilities shall also be submitted.	programs as part of regular operations of the facility. Copies of the results of these efforts have been submitted as part of this project.
Policy 56. Encourage existing and proposed facilities to focus on measures and procedures that prevent oil, gas, and other toxic releases into the environment. This policy is to ensure that facilities: (1) take measures to prevent releases and spills, (2) prepare for responding to a spill or release, and 3) provide for the protection of sensitive resources. A review of a facilities spill response plan, or reports from other agencies, should be completed to monitor compliance.	Section 5.10 – Hazards/Risk of Upset contains a review of the existing facilities spill response plans and related reports. Findings fro this review show that the existing and proposed facilities contain measures and procedures that prevent oil, gas, and other toxic releases into the environment.
Policy 57. Require consolidation of facilities in any expansion project, to the maximum extent technically, environmentally, and economically feasible. Commingled processing shall be required where appropriate, to avoid or reduce project and cumulative impacts.	Proposed project facilities will be consolidated to the extent feasible to existing well pads. Only four new pads will be constructed as part of this project and directional drilling will be utilized to the extent feasible to avoid or reduce project impacts.
Policy 58. When new sites are needed for industrial or energy-related development, expansion of facilities on existing sites (or on land adjacent to existing sites) shall take priority over opening up additional areas or the construction of new facilities. Exceptions will only be allowed when it can be shown that (1) alternative locations) are infeasible and that the environmental impacts of opening up new sites are less than the impacts of expansion on or adjacent to existing sites, (2) to do otherwise would adversely affect the public welfare, and (3) adverse environmental impacts are mitigated to the maximum extent feasible. Adverse environmental impacts from the siting or expansion of existing industrial or energy developments shall be mitigated to the	The project involves the expansion of existing facilities within an area that is already used for oil production. No new areas outside of the existing project area will be impacted. Mitigation measures have been proposed to mitigate adverse environmental impacts to the maximum extent feasible.

Policy Statement	Project Consistency Discussion
maximum extent feasible.	
Policy 58. Guideline 58.1. An adequate source of water for use by the facility shall be identified in the project application. The application shall include information about the amount and source of water used by the facility. The types of activities the water will be used for shall also be described.	The proposed project will utilize existing water supplies. The amount, source, and application of this water is described in Chapter 3.0 - Project Description.
Policy 58. Guideline 58.2. Site specific surveys, including inventorying of rare plants, should be completed at the appropriate time of the year, as part of preliminary work for any proposed facility. Consideration shall be given to the various seasons of migratory or transitory species. Further study may be required as part of the environmental review process.	As described in Section 5.5 - Biological Resources, site-specific surveys, including inventorying rare plants, were completed for this project in Spring 2003.
Policy 58. Guideline 58.3. Site specific mitigation measures should be proposed with the application to mitigate construction and long-term impacts on terrestrial biota. The applicant shall submit a restoration, erosion control, and revegetation plan that is consistent with the results of the environmental review process. The plan must be approved by the County Planning and Building Department.	Site-specific measures are included in Section 5.5 - Biological Resources to mitigate construction and long-term impacts on terrestrial biota.
Policy 58. Guideline 58.4. To enhance compatibility with surrounding areas, no direct beams of exterior lighting should be visible beyond the boundaries of the parcel. Low intensity, shielded, and highly efficient fixtures are preferred for outdoor lighting at a facility.	Low intensity, shielded, and highly efficient fixtures are utilized for outdoor lighting and no direct beams to nearby residences will occur. See Section 5.3 - Aesthetics.
Policy 58. Guideline 58.5. Proposed facilities shall be screened or fenced from view to reduce visual impacts identified during the environmental review process. Requirements for screening are included in the land use ordinances.	Proposed facilities are screened from view to the extent feasible to reduce visual impacts. Such screening includes existing berms and vegetation and additional plantings. See Section 5.3 - Aesthetics.
Policy 58. Guideline 58.6. Facilities should be sited in swales or other natural	Proposed facilities are located to the extent feasible in swales and other natural depressions. The proposed

Policy Statement	Project Consistency Discussion
depressions where appropriate and should not be profiled against horizons.	new well pad Maino 16NW will be located on a hill and will be visible to motorists traveling along Price Canyon Road. Biological mitigation measures have been developed to reduce impacts. See Section 5.3 - Aesthetics for more discussion.
Policy 58. Guideline 58.7. Screen facilities from public view through height limitation, careful site design, artificial contoured banks and mounding, extensive landscaping, and decorative walls and fences.	Proposed facilities are screened to the extent feasible from public view by existing vegetation and topography. See Section 5.3 - Aesthetics.
Policy 58. Guideline 58.8. Any part of the facilities that cannot be effectively screened shall be painted with non-reflective paint and with colors which blend with the surrounding natural landscape.	Proposed facilities will be painted with a flat green, non-reflective paint that blends with the surrounding natural landscape of the project site. See Section 5.3 – Aesthetics.
Policy 62. Consolidate new pipeline corridors within existing pipeline or electrical transmission corridors to the maximum extent technically and environmentally feasible.	Any required flowlines will be installed above ground along existing pipe corridors to minimize environmental disturbances.
Policy 63. If new pipelines are necessary, encourage common carrier or multiple-user pipeline construction and use.	Any required flowlines will be installed above ground along existing pipe corridors to minimize environmental disturbances.
Policy 64. Guideline 64.1. To reduce the possibility of injury to the public, facility employees, or the environment, the applicant shall submit an emergency response plan which details response procedures for incidents that may affect human health and safety or the environment. The plan shall be based on the results of the comprehensive risk analysis. In the case of a facility modification, the existing response plan shall be evaluated by the safety review committee and revisions made as recommended.	The applicant has prepared an emergency response plan for existing and proposed operations. Section 5.10 – Hazards/Risk of Upset contains a review of this plan.
Policy 64. Guideline 64.2. Major new facilities shall be sited within five minutes response time of an adequately staffed and equipped fire/emergency response station. A fire protection system and response plan shall be approved by the governing authority.	The project involves the expansion of an existing facility, not construction of a new one. Such expansion will include construction of new oil wells, steam generators and pipelines. The response time from the fire station responsible for protection is 7 to 10 minutes. That station is the

Policy Statement	Project Consistency Discussion
	CDF/San Luis Obispo County fire Department Airport Station located 4.3 miles from the project area. The City of Pismo Beach Fire Stations does not have jurisdictional responsibility for the project area although an automatic aid agreement currently exists with the City of Pismo Beach which contracts with CDF for fire protection. The City station is located 3.6 miles from the oil field and the response time is over 5 minutes. Although the facility is not within a 5-minute response time, the project does not involve construction of a new facility, but rather construction of new components of an existing facility, ~~Nevertheless, the City of Pismo Beach operates a fire station within city limits, near Price Canyon Road, about 2 miles from the project site.~~
Policy 65. In the event of a petroleum or hydrocarbon release, implement the following policies: • Emergency response and initial clean up of the spill site shall be completed as soon as possible. An emergency permit shall be granted as appropriate. A state of emergency as defined in the general plan must exist for a permit to be granted. • Environmental impacts caused by response and clean up activities shall be minimized. Environmental monitors(s) shall be onsite to reduce possible impacts. • A post-spill environmental assessment of the site shall be performed to evaluate and quantify the damage to resources. • Remediation and restoration of the site to pre-spill conditions shall be completed. • If the site cannot be restored to its pre-spill condition, the responsible party shall contribute to an environmental enhancement fund to be used for on or off-site mitigation projects.	Section 5.10 – Hazards/Risk of Upset contains measures to minimize impacts in the event of a petroleum or hydrocarbon release.

Impact LND-6. Consistency with the County of San Luis Obispo Agriculture and Open Space Element.

Discussion: Specific policies regarding the protection of agricultural lands are contained in the Agriculture & Open Space Element under Chapter 2, entitled Agricultural Element (adopted December 15, 1998). Table 4.4-2 lists the *applicable* polices contained with this element and provides a discussion of how the proposed project is consistent with each of these policies. Overall, the project is consistent with the Agriculture & Open Space Element.

Impact Category: Class 3

Threshold of Significance: 2

Mitigation Measures: No significant impacts were identified; therefore, no mitigation is necessary. The project would have to comply with all applicable policies described above, as interpreted by the County of San Luis Obispo.

Table 4.4-2
San Luis Obispo County Agriculture & Open Space Element

Policy Statement	Project Consistency Discussion
AGP25: Unique or Sensitive Habitat a) Encourage private landowners to protect and preserve unique or sensitive habitat. b) For new development requiring a discretionary permit and for proposed land divisions, protect unique or sensitive habitat affected by the proposal through the following measures: 1. Site the proposed development so as to avoid significant impacts on the habitat to significant impacts on the agricultural operations. Provide for adjustments in project design where alternatives are infeasible, more environmental damaging, or have significant negative impact on agriculture. 2. When significant impacts are identified, the landowner shall implement county-approved mitigation measures consistent with the existing requirements of CEQA.	Construction (e.g., clearing and grubbing of vegetation, rough grading, drilling, etc.) of any area within a buffer zone of 100 feet from both sides of Pismo Creek's banks (San Luis Obispo County Land Use Ordinance 22.07.166) shall be avoided. Pismo Creek and the required 100-foot buffer shall be illustrated on final project plans and adhered to during the construction period. Compliance will be verified by the Planning Department (or designee). In addition, a SPCC will be required for the project.

Policy Statement	Project Consistency Discussion
AGP26: Streams and Riparian Corridors. The following policies apply to watercourses shown by a solid or broken blue line ("blue line" streams) on the latest U.S. Geological Survey (USGS) quadrangle maps and their associated riparian vegetation. a) Encourage private landowners to protect and preserve steam corridors in their natural state and to restore stream corridors that have been degraded. Provide information and incentives to eliminate overgrazing in stream corridors. Encourage off-stream livestock watering sources. b) For new development requiring a discretionary permit and for land division, protect streams and riparian habitat affected by the proposal through the following measures: 1. Consistent with the requirements of the Regional Water Control Board's Basin Plan, establish a grading and building setback of 30 feet from the top of the steam bank. Locate buildings and structures outside the setback. Do not remove riparian vegetation within 30 feet of the top of the stream bank. Provide for adjustments when the applicant demonstrates that such setbacks would have a significant negative impact on the agricultural viability of the site, or where alternatives are infeasible or more environmentally damaging, and the adjustments are acceptable to the Regional Board. 2. Require appropriate erosion control measures during and following construction. 3. Consistent with state and federal requirements, allow stream alterations for water supply and	Although a substantial increase in sediment load associated with grading activities or an inadvertent oil spill into Pismo Creek is considered low due to the distance of the majority of proposed well pad construction from the creek, the potential still exists for such occurrence. Construction (e.g., clearing and grubbing of vegetation, rough grading, drilling, etc.) of any area within a buffer zone of 100 feet from both sides of Pismo Creek's banks (San Luis Obispo County Land Use Ordinance 22.07.166) shall be avoided. Pismo Creek and the required 100-foot buffer shall be illustrated on final project plans and adhered to during the construction period. Compliance will be verified by the Planning Department (or designee). In addition, a SPCC will be required for the project.

Policy Statement	Project Consistency Discussion
flood control projects, road maintenance, maintenance of existing channels, or improvement of fish and wildlife habitat if there are no practical alternatives. 4. Consistence with state and federal requirements, assure that stream diversion structures project habitats. 5. When significant impacts to stream or riparian resources are identified, the landowner shall implement county-approved mitigation measures consistent with the existing requirements of CEQA.	
AGP33: Archaeological and Cultural Sites. a) When reviewing discretionary development, protect sensitive archaeological and cultural sites by avoiding disturbance where feasible. b) If sensitive sites cannot be avoided, mitigate the impact of development to the maximum extent feasible.	Section 5.6 Cultural Resources contains a discussion of the archaeological and cultural resources at the project site as well as mitigation measures to avoid or minimize impacts to such resources. No significant impacts to archaeological resources will occur, therefore, the project is consistent with this policy.
AGP34: Historical Resources. a) When initiated by landowners, protect the character of significant historical features and settings by implementing the recommendation for historical resources found in the Historic Element of the Environment Plan	Section 5.6 Cultural Resources contains a discussion of the historical resources at the project site as well as mitigation measures to avoid or minimize impacts to such resources. No significant impacts to historical resources will occur, therefore, the project is consistent with this policy.

CHAPTER 5.0
ENVIRONMENTAL IMPACT ANALYSIS

This chapter of the report examines the environmental issues for which the proposed project will or may have adverse impacts. Each section contains four subsections. The "Introduction" subsection presents introductory information regarding the issue area discussion. The "Environmental Setting" subsection describes the existing environmental and/or regulatory structure affecting the project area. The "Impacts and Mitigation Measures" subsection evaluates the impacts of the proposed project and proposed mitigation measures to lessen or eliminate those impacts. Residual impacts describing the level of the project impacts after implementation of the recommended mitigation measures are also discussed.

The "Cumulative Impacts" subsection discusses the combined impacts of the proposed project in conjunction with other projects proposed in the vicinity. A qualitative discussion of the impacts for each of the identified project alternative in comparison to the proposed project is presented in Chapter 6.0.

Short-term and long-term impacts are analyzed for the Proposed Project. Each impact statement is classified as to the level of significance, based on the significance thresholds (see Section 1.5 for discussion), and the availability of measures to feasibly mitigate project effects. Impact categories include:

- Class I. Significant unavoidable adverse impacts that cannot be mitigated. A Class I impact is one for which a solution has not been formulated, either because of the limits of technical and/or scientific knowledge, or infeasibility from a technical, economic, and/or political perspective. Under CEQA, a Class I impact would require a "finding of overriding consideration" by the County to approve the project.
- Class II. Adverse environmental impacts that can be mitigated to less than significant levels. Measures have been identified that can feasibly be implemented and will avoid the impact altogether by not taking a certain action or parts of an action; minimize impacts by limiting the degree or magnitude of the action and its implementation; rectify the impact by repairing, rehabilitating, or restoring the affected environment; or compensate for the impact by replacing or providing substitute resources or environments.
- Class III. Adverse environmental impacts that are less than significant or have no identified impact. These impacts, while adverse, are not of a sufficient magnitude, intensity, or duration to disrupt the environment, and have no serious consequences. As a result, no mitigation is required.
- Class IV. Beneficial impacts benefit or improve the environment and no mitigation is required.

5.1 OTHER ISSUES

The following issues were deemed to be insignificant during an preliminary environmental analysis conducted during as part of the initial application phase of the proposed Phase IV Development Plan:

- **Agricultural Resources** – The project will not adversely affect agricultural resources.
- **Population** – The proposed project will not substantially alter the location, distribution, density, or growth rate of the human population of an area;
- **Housing** – The proposed project will not adversely affect existing housing, or create a demand for additional housing;
- **Public Services** – The project will not have an effect upon, or result in, a need for new or altered public services;
- **Energy** – The proposed project will not use of substantial amounts of fuel or energy or substantially increase demand upon existing sources of energy, or require the development of new sources of energy;
- **Utilities** – The proposed project will not result in a need for new systems, or substantial alterations to existing utilities;
- **Human Health** – The proposed project will not create any health hazard or potential health hazard (excluding mental health) or expose people to potential health hazards; and,
- **Recreation** – The proposed project will not affect the quality or quantity of existing recreational opportunities.

5.2 TRAFFIC AND CIRCULATION

The following chapter contains an analysis of the traffic and circulation impacts associated with the proposed Plains Exploration and Production (PXP) Arroyo Grande oil field Phase IV Development Project, located adjacent to Price Canyon Road in San Luis Obispo County. The analysis procedures used in this study to determine roadway operational levels are based on information previously documented in the *2001 Traffic and Circulation Study for the Stocker Resources Arroyo Grande Oil Field Phase IV Project*, prepared by Associated Transportation Engineers (ATE). The report provides information relative to existing and future traffic conditions within the study area adjacent to the project site, and evaluates impacts related to both the construction and ongoing operations phases of the proposed project. A definition of each level of service classification is contained in Appendix C of this document.

5.2.1 Setting

5.2.1.1 Existing Roadway Network

Regional access to the project site is provided by State Route 227, Price Canyon Road and Ormonde Road, as shown in Figure 5.2-1. The following text contains a brief description of the principal roadway segments which provide access to the study area.

State Route 227 – is a two-lane rural highway which extends between the Cities of Arroyo Grande on the southeast and San Luis Obispo on the northwest. The segment of State Route 227 south of Price Canyon Road is generally narrow with no shoulders and a curvilinear alignment. North of Price Canyon Road, the roadway becomes straighter and widens out to provide shoulders. Access to the project site from State Route 227 is provided via the Price Canyon Road connection. The SR 227/Price Canyon Road intersection is signalized.

Price Canyon Road – is a north-south improved two-lane County road which extends from the City of Pismo Beach on the south to State Route 227 on the north. Price Canyon Road bisects the Arroyo Grande oil field site and provides direct access to the site at the entrance located opposite Ormonde Road. The Price Canyon Road/Ormonde Road intersection is controlled by stop signs on Ormonde Road. At the field headquarters, visibility on Price Canyon Road to the south is good, however visibility to the north is somewhat restricted due to roadway curvature and the presence of a small hill.

Ormonde Road – is an east-west two-lane County road that crosses the Arroyo Grande oil field site and connects to Price Canyon Road. This road provides access to the oil field located east of Price Canyon Road and extends easterly, eventually connecting with Noyes Road. In the vicinity of the oilfield, the roadway is improved and the pavement structure is in good condition. The Union Pacific Railroad undercrossing on Ormonde Road is only one-lane, but is adequate to accommodate three or more axle truck traffic.

Price Street – is a two-lane and four-lane north-south arterial that serves the commercial core of the Pismo Beach area between the U.S. Highway 101 southbound off-ramp at the Mattie Road Interchange and the U.S. Highway 101 ramps at Ocean View Avenue. Price Street is presently controlled by traffic signals at Hinds Avenue and Shell Beach Road/Mattie Road.

Hinds Avenue – is a two-lane east-east arterial serving the Pismo Beach downtown commercial core extending from its connection with Price Canyon Road at Bello Street to Dolliver Street.

West of Dolliver Street, Hinds Avenue becomes a one-way (eastbound) collector street and serves the public parking lot at the foot of the Pismo Pier. Hinds Avenue is presently controlled by traffic signals at Dolliver Street and Price Street.

The intersection of Price Street and Hinds Avenue facilitates movement of traffic from Price Canyon Road into downtown Pismo Beach and onto southbound Highway 101.

5.2.1.2 Existing Volumes and Levels of Service

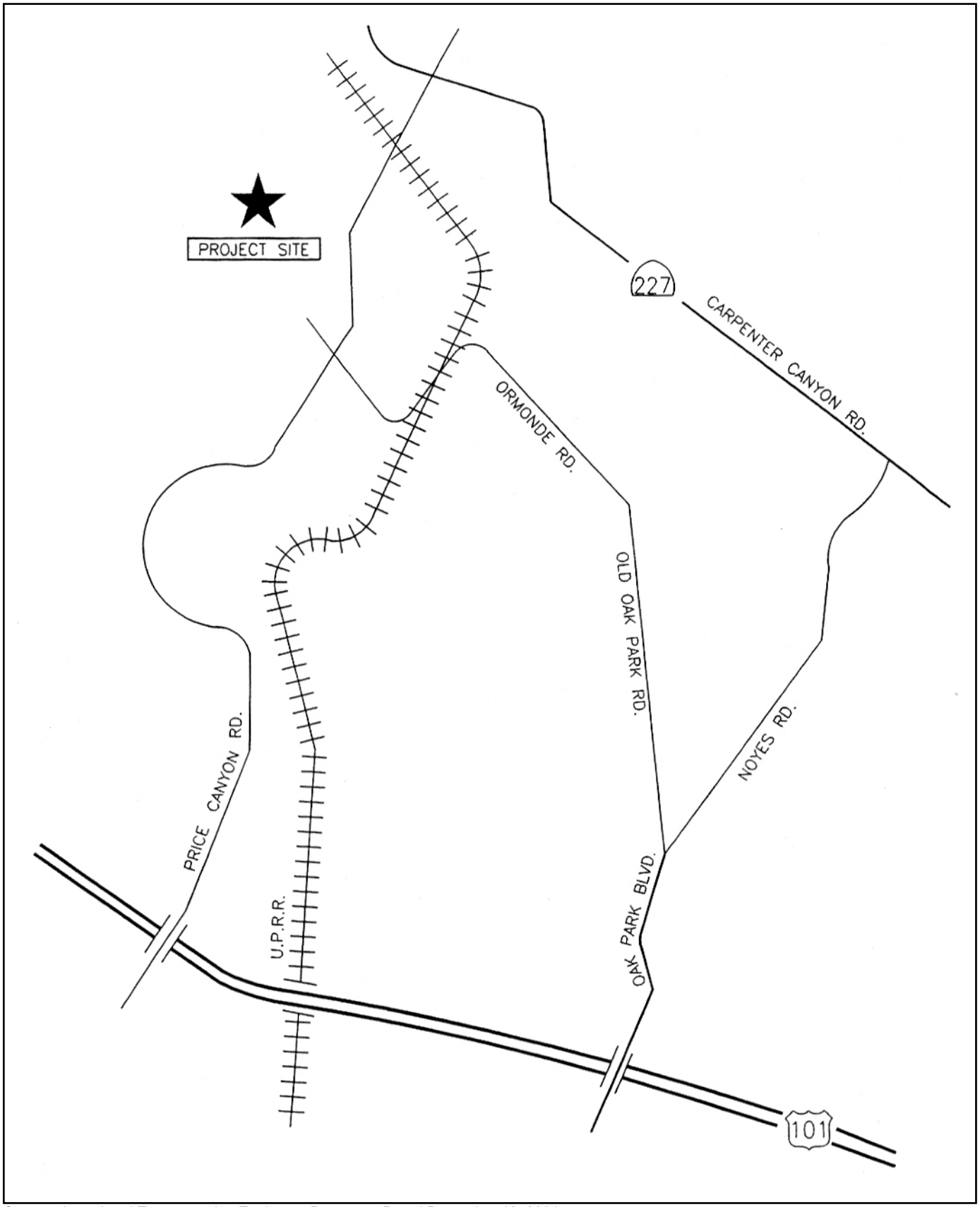
Existing average daily traffic (ADT) volumes and level of service (LOS) for the roadway network serving the study-area were obtained from the recent traffic and circulation study prepared by ATE. Figure 5.2-2 illustrates the planning area roadway network and the existing ADT volumes for the street segments included in the study.

In evaluating roadway operational conditions with existing and/or future traffic volumes, LOS A through F are applied, with LOS A indicating very good operating conditions and LOS F indicating poor conditions. The County of San Luis Obispo has adopted LOC C as the minimum standard for rural roadway operations.

ATE analyzed the operational characteristics of the roadway segments within the study area based on standard engineering roadway design capacities. Existing volumes for the street segments in the study area were obtained from machine counts completed in August 2001 by ATE and from Caltrans (Caltrans, 2000). Figure 5.2-2 illustrates the existing ADT volumes within the study area. Comparison of the existing ADT volumes and the corresponding design capacity for each roadway segment shows that all of the study-area roadways currently operate acceptably in the LOS A-C range.

Existing Levels of Services for Price Street/Hinds Avenue were taken from the traffic study for the Stimson Street Residential Project (ATE 2002).

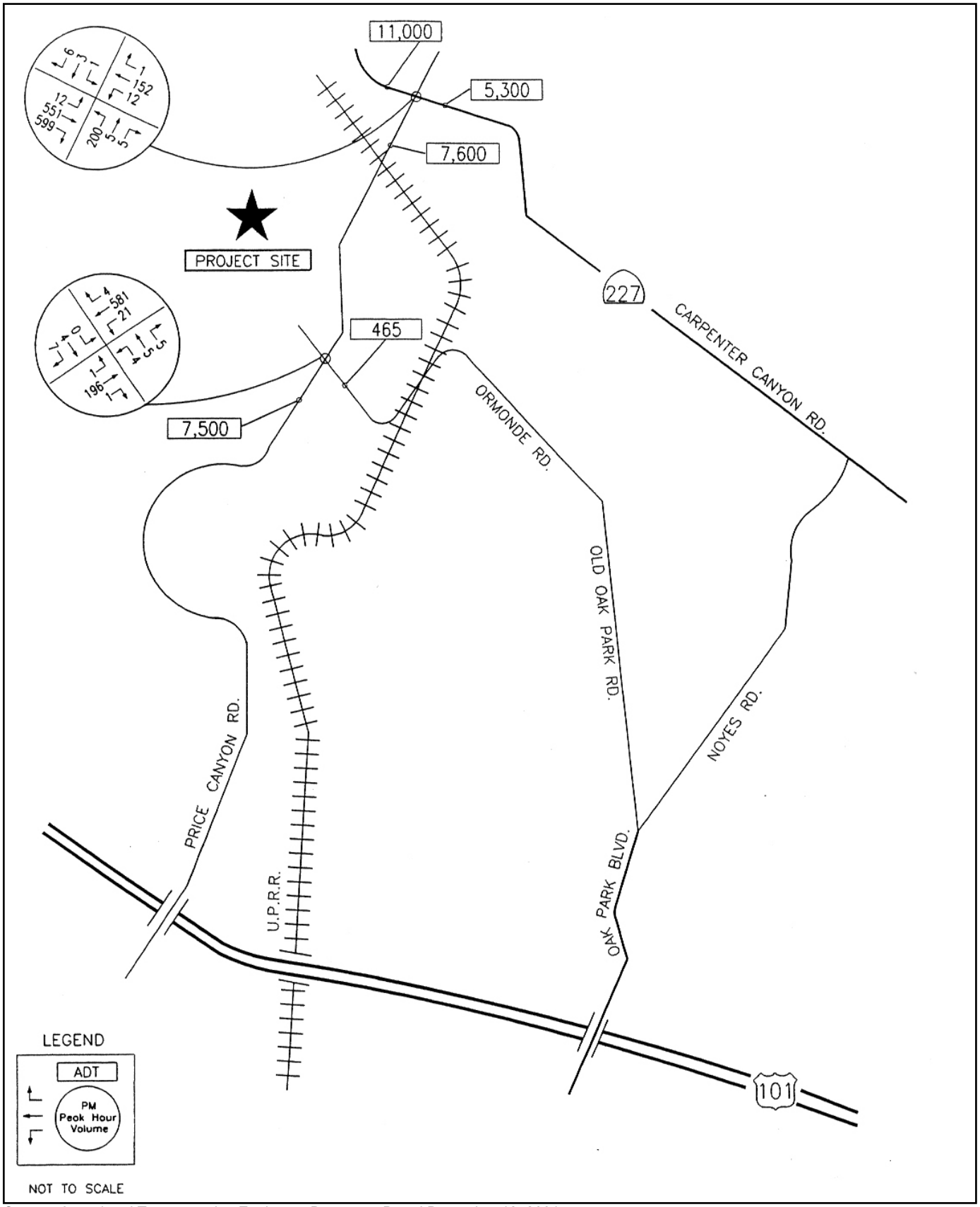
Because traffic flow on urban street networks is most constrained at intersections, detailed traffic flow analyses focus on the operating conditions of critical intersections during peak travel periods. The LOS A to LOS F grading system discussed previously for roadway segments is also used to rate intersection operations. As such, the County has also adopted LOS C as the minimum acceptable service level for rural intersections. Table 5.2-1 lists the existing level of service for each intersection based on volume counts and delay studies performed by ATE in August 2001. ATE, using the operations method outlined in the Highway Capacity Manual, calculated levels of service for the signalized intersections. As shown in the Table, the study area intersections currently operate in the LOS A range, which is considered a good service level.



Source: Associated Transportation Engineers Document Dated December 12, 2001.

EXISTING STREET NETWORK/PROJECT SITE LOCATION

FIGURE 5.2-1



Source: Associated Transportation Engineers Document Dated December 12, 2001.

EXISTING TRAFFIC VOLUMES

FIGURE 5.2-2

Table 5.2-1
Existing P.M. Intersection Levels of Service

Intersection	Control Type	Existing Delay / LOS
Price Canyon Road/Ormonde Road	2-way Stop	8.3 sec. / LOS A
Price Canyon Road/Highway 227	Signalized	6.6 sec. / LOS A
Price Street/Hinds Avenue	Signalized	15.4/LOS B

5.2.2 Impact Analysis

5.2.2.1 Thresholds of Significance

For purposes of this impact analysis, significant impacts to transportation and circulation would occur if project-related activities would result in any of the following:

1. A reduction of roadway levels of service to less than a level "C";
2. Would result in unsafe conditions on public roadways;
3. Not provide for adequate emergency access; or,
4. Would conflict with adopted policies, plans, or programs supporting alternative transportation.

5.2.2.2 Project Trip Generation

The development of the project would occur in three phases: construction phase, drilling phase and operations phase. The applicant has provided construction and operational data indicating that construction, drilling activities and operation (production) could overlap. The project trip generation estimates therefore assume a "worst case" scenario, with a maximum overlap of these activities. Trip generation estimates for the study area were estimated by ATE, utilizing estimates for the combined activities, incorporating the following employee and delivery schedules:

- Construction personnel would work four 10-hour days from the hours of 7:00 A.M. to 4:00 P.M. Thus, construction personnel would depart the premises during the P.M. peak hour;
- Construction related deliveries (pipe, concrete etc.) are estimated at a maximum of two per day.
- Drilling personnel would potentially comprise three 8-hour shifts with four workers per shift. Shift changes would occur at 8:00 A.M., 4:00 P.M., and midnight. Thus, one shift change would occur during the P.M. peak hour;
- The high estimate for drilling related deliveries is 22 per day. This estimate is for days when conductor pipes would be cemented (one load each for three conductors at one time), gravel would be delivered for site use (three drilling sites per day with six loads per site), and mud would be utilized for onsite improvements or transported off-site (one load per day);

- No new employees would be required for the operational phase of the project. Current production is 1,800 bbl/day and is estimated to increase to 5,000 bbl/day. Data indicates that 25 additional transport trucks are need for daily off-site transportation of the produced oil; and,
- Table 5.2-2 indicates that the Phase IV Project would generate 138 average daily trips and 30 P.M. peak hour trips. This assumes "worst case" overlapping of construction, drilling and operations.

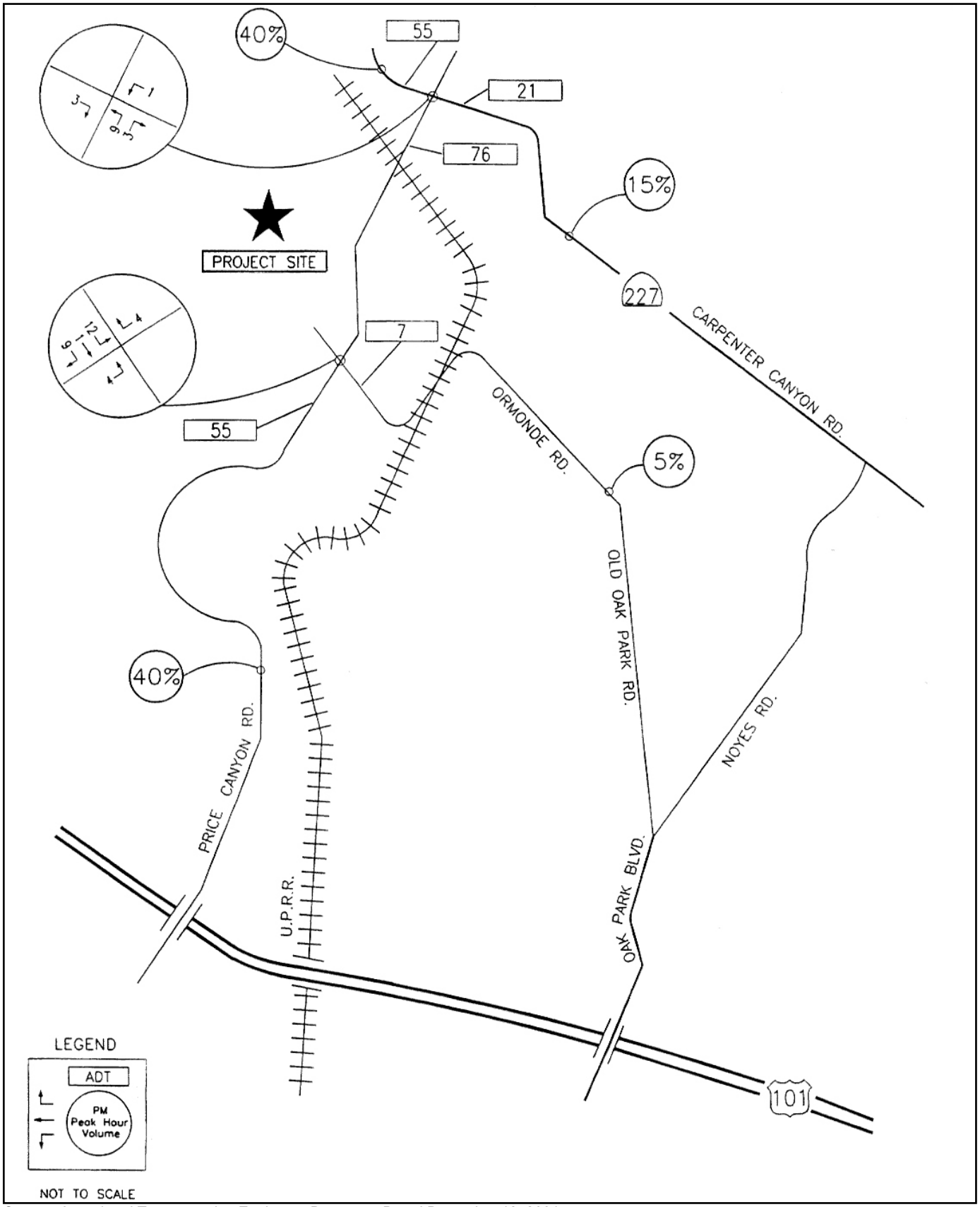
5.2.2.3 Project Trip Distribution and Assignment

The daily and peak hour trips that would be generated at the site during the project construction and operation phases were distributed onto the study-area roadway network by ATE according to the percentages listed in Table 5.2-3. Once distributed, project-generated traffic volumes were assigned to the study-area roadway segments, as illustrated in Figure 5.2-3.

Table 5.2-2
Project Trip Generation Estimates with Overlapping Schedules

Component	Personnel	Vehicles	Daily Trips			P.M. Peak Hour Trips		
			Arrivals	Departures	Total	Arrivals	Departures	Total
Construction								
Well locations	8	4	4	4	8	0	4	4
Conductor Pipe	4	2	2	2	4	0	2	2
Steam Generator	NA	NA	NA	NA	NA	NA	NA	NA
Piping & Other	8	6	6	6	12	0	6	6
Inspection	2	2	2	2	4	0	2	2
Deliveries*	2	2	2	2	4	1	1	2
Drilling								
Drill Crew	12	6	6	6	12	2	2	4
Deliveries**	NA	22	22	22	44	2	2	4
Operations								
Employees	NA	NA	NA	NA	NA	NA	NA	NA
Transport trucks**	NA	25	25	25	50	3	3	6
Totals			**69**	**69**	**138**	**8**	**22**	**30**

NA = Not Applicable
* assumes 1 trip during P.M. peak hour
** assumes 10% of delivery trips during P.M. peak hour



Source: Associated Transportation Engineers Document Dated December 12, 2001.

PROJECT TRIP DISTRIBUTION PERCENTAGES
PROJECT-ADDED TRAFFIC VOLUMES

FIGURE 5.2-3

Table 5.2-3
Trip Distribution Percentages

Origin/Destination	Direction	Percent
State Route 227*	North	40%
State Route 227*	South	15%
Price Canyon Road	South	40%
Ormonde Road	East	5%
Total		**100%**

* via Price Canyon

Once assigned, the project-generated volumes were added to the existing volumes. Figure 5.2-4 shows the traffic volumes for the study-area roadways and intersections at Project Implementation.

5.2.2.4 Project-Specific Impacts

Impact TRA-1: Construction-related traffic may reduce the LOS along Price Canyon Road.

Discussion: Based on the traffic analysis completed by ATE (2001), the LOS for both roadway segments and intersections would not be degraded by the proposed project.

Impact Category: Class 3

Threshold of Significance: 1

Mitigation Measure: No mitigation is required, since the project will not result in any impacts to roadway segments.

Residual Impacts

None.

Impact TRA-2: Entering and exiting of the trucks may reduce traffic safety on Price Canyon Road during the A.M. and P.M. peak hour.

Discussion: The construction of 95 oil wells and 30 injection wells would occur in the northeast corner of the Arroyo Grand Oilfield, within the Phase IV boundary. Up to 10 trucks would be used for transport of equipment and deliveries during the construction/drilling phase. An additional 25 transport trucks would be needed for off-site transportation of oil. Entering and exiting of these trucks may reduced traffic safety on Price Canyon Road during the A.M. and P.M. peak hour.

Impact Category: Class 2

Thresholds of Significance: 2, 3, 4

Mitigation Measure TRA-2:

The following mitigation measures are included to minimize degradation of traffic safety:

- Trucks (delivery, hauling and transportation trucks) should be scheduled outside the A.M. and P.M. peak period (7:00 to 9:00 A.M. and 4:00 to 6:00 P.M.) to the extent feasible (no increase in trucks trips will occur during the A.M. and P.M. peak periods)[1];
- Construction related traffic shall use on-site roads wherever possible; and,
- Warning signs should be placed on Price Canyon Road prior to construction to notify through traffic of trucks entering and exiting the site.

Residual Impacts

With the inclusion of mitigation measures, impacts to traffic safety during peak hours will be minimal.

5.2.2.5 Cumulative Impacts

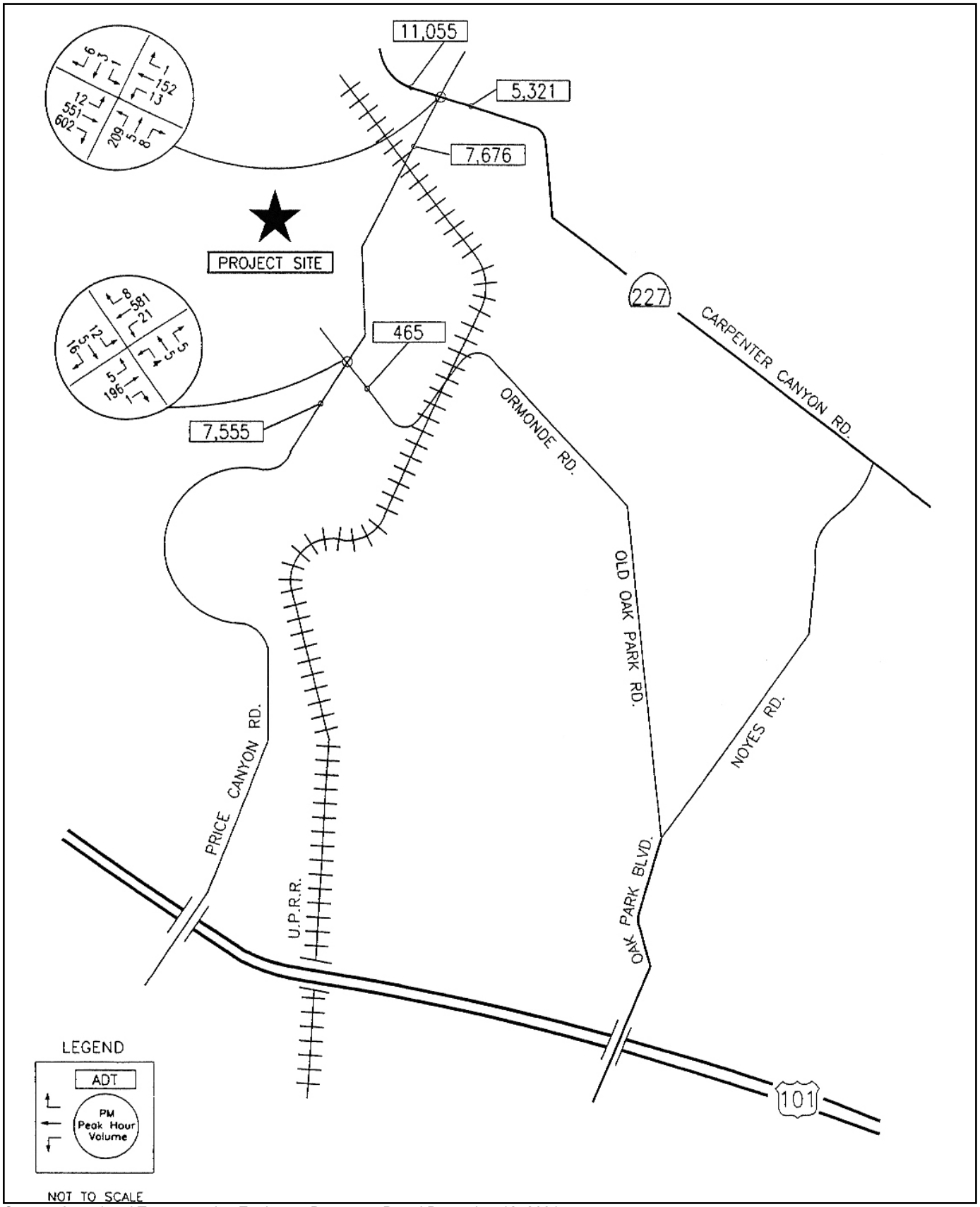
Baseline Cumulative Volumes

Growth factors were used to forecast Cumulative traffic volumes for the Year 2021 (20-year design period). The growth factors were developed by using traffic counts documented in the area over the last 10 years. Table 5.2-4 show the Year 2021 ADT forecasts for each roadway segment.

Table 5.2-4
Year 2021 ADT Forecasts

Roadway Segment	Annual Rate	20-year Growth Rate	Year 2001 ADT	Year 2021 ADT
SR 227 – north of Price Canyon Road	2.0%	40%	11,000	15,400
SR 227 – south of Price Canyon Road	5.0%	100%	5,300	10,600
Price Canyon Road – north of Ormonde Road	4.4%	88%	7,600	14,300
Price Canyon Road – south of Ormonde Road	4.4%	88%	7,500	14,100
Ormonde Road east of Price Canyon Road	7.3%	146%	465	680

[1] This shall include trucks traveling onto Highway 101 from Price Canyon Road.



Source: Associated Transportation Engineers Document Dated December 12, 2001.

EXISTING + PROJECT TRAFFIC VOLUMES

FIGURE 5.2-4

Roadways. Figure 5.2-5 shows the Cumulative ADT volumes forecast for the study-area roadways. Both the State Route 227 and Price Canyon Road would operate in the LOS C range which is within the County's acceptable threshold. Ormonde Road is forecast to operate at LOS A.

Intersections. Growth factors derived from historical traffic counts discussed earlier were applied to the existing volumes to forecast Cumulative intersection traffic volumes. Because no historical growth rate data was available for Price Canyon Road north of State Route 227, a growth factor of 4.4% per year was assumed for this road segment. This is the same as the growth factor south of State Route 227. Figure 5.2-5 shows the cumulative P.M. intersection traffic volumes.

Cumulative + Project Volumes

Project traffic was added to the year 2021 traffic forecasts to develop Cumulative + Project traffic volumes, as shown in Figure 5.2-6.

Roadways. Based on design capacity standards discussed previously it was determined that State Route 227 and Price Canyon Road would continue to operate at LOS C, and Ormonde Road would continue to operate at LOS A. The roadway traffic additions generated by the project would not significantly affect the study-area street system under cumulative conditions.

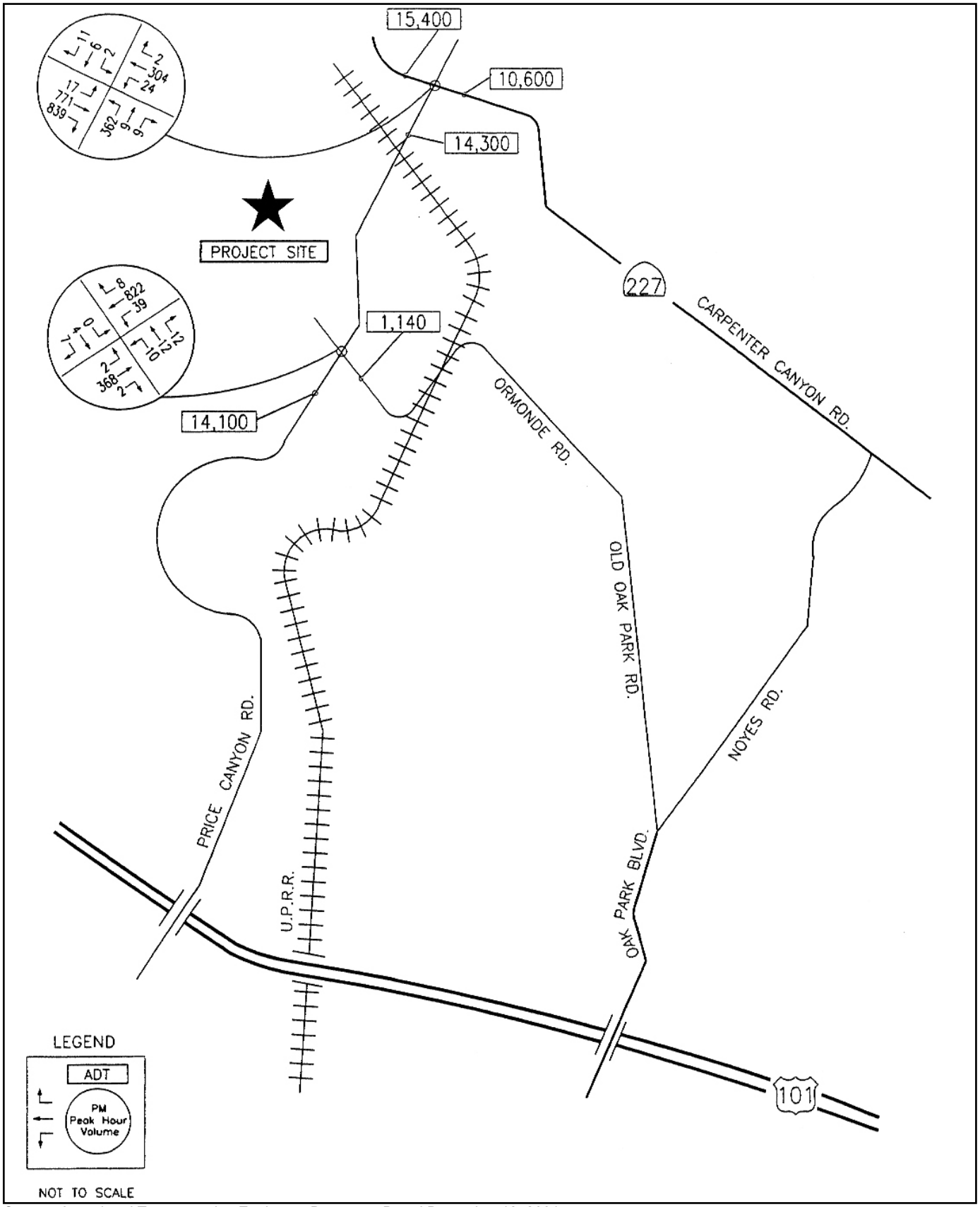
Intersections. Table 5.2-5 lists the P.M. peak hour levels of service for the study-area intersections. The data presented indicates that under Cumulative + Project conditions, the study area intersections would operate at LOS A or LOS B, which is within the County's threshold of LOS C standard for rural intersections.

Table 5.2-5
Cumulative and Cumulative + Project P.M. Intersection LOS

Intersection	Cumulative Delay/LOS	Cumulative + Project Delay/LOS
Price Canyon Road – north of Ormonde Road	9.2 sec./LOS A	9.1 sec./LOS A
Price Canyon Road/Hwy 227	10.6 sec./LOS B	11.2 sec./LOS B

Based on the City of Pismo Beach Circulation Element Update (ATE 1992), the cumulative levels of service for the Price Street/Hinds Avenue intersection is forecasted to operate at LOS F with cumulative traffic. However, the Circulation Element identifies roadway improvements to mitigate cumulative traffic. Street network mitigations include the proposed widening of Price Canyon Road to four lanes. This will add capacity at the Price Street/Hinds Avenue intersection and improve its level of service to "C".

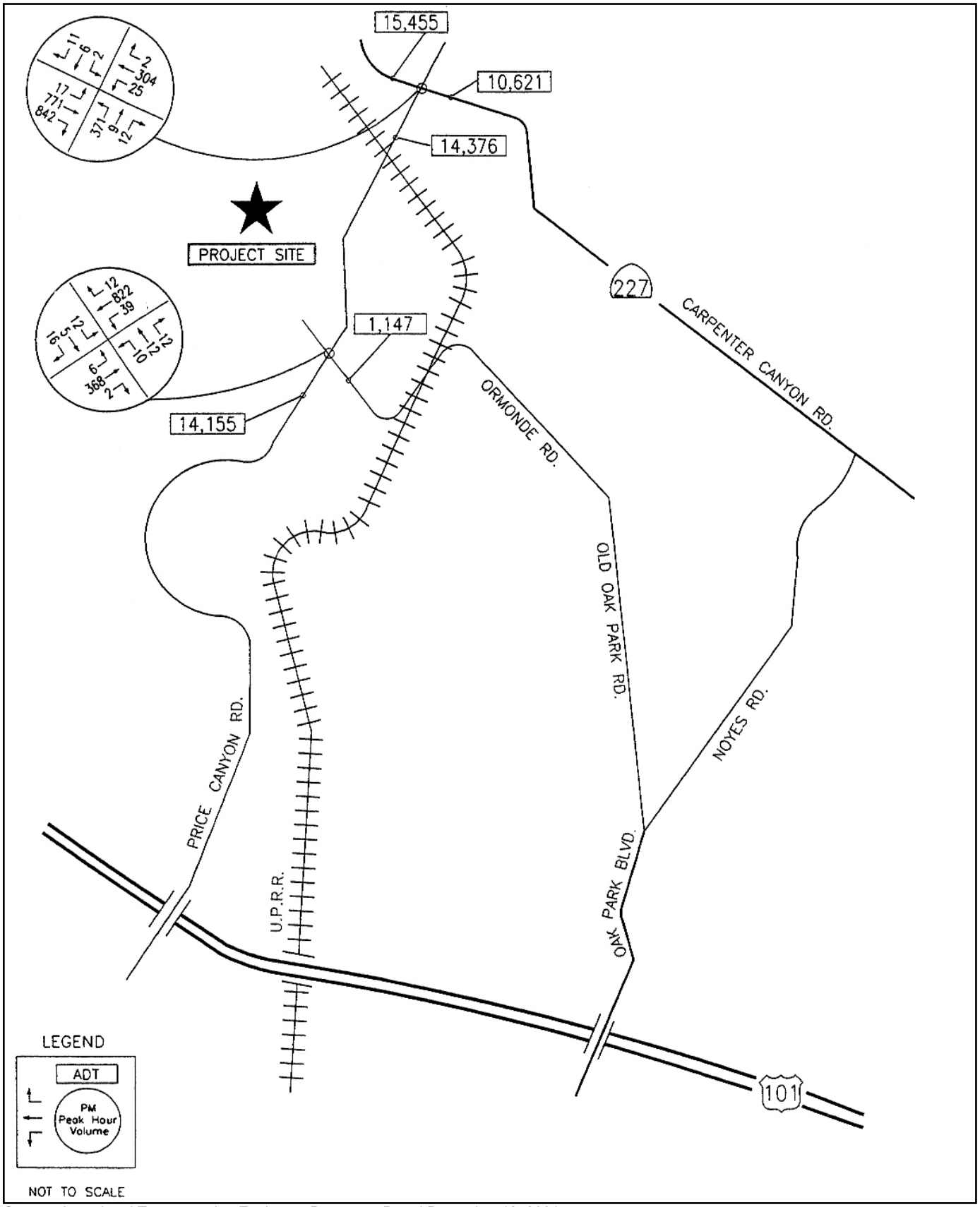
Mitigation: The project would not generate significant impacts under Cumulative conditions, thus, no mitigation is required.



Source: Associated Transportation Engineers Document Dated December 12, 2001.

CUMULATIVE TRAFFIC VOLUMES

FIGURE 5.2-5



Source: Associated Transportation Engineers Document Dated December 12, 2001.

CUMULATIVE + PROJECT TRAFFIC VOLUMES

FIGURE 5.2-6

5.3 AESTHETICS

This section addresses the aesthetic resources of the existing natural and human-affected environment in the Price Canyon area. The scenic resources of this area are important resources to adjacent communities. This section also addresses the impacts to these resources from the proposed project.

5.3.1 Setting

The project is located in the Arroyo Grande oil field in Price Canyon, on both sides of Price Canyon Road, approximately 3 miles northeast of the city of Pismo Beach. Price Canyon is a scenic, rural valley amid rolling hills dotted with scattered oak trees; however, it is not officially a designated scenic highway (K. Miller 2003). The Union Pacific Railroad and Pismo Creek, both which parallel Price Canyon Road to the east, roughly bisect the proposed Phase IV project area. Land uses in the vicinity of the project are primarily livestock grazing.

Oil production has occurred on the project site since 1906. PXP currently produces approximately 1,800-1,900 BOPD from about 125 producing wells. Many of the existing wells on the property are collocated with steam injection wells, which provide steam for enhanced oil recovery. Other existing production facilities include above-ground pipelines, 6 steam generators (4 west of price Canyon Road; 2 east of the road), “steam headers” (which distribute steam to the steam injection wells), a dehydration facility for the entire field and a gas plant. The dehydration and gas plants are located on the west side of Price Canyon Road. The dehydration plant has several associated facilities, including heater treaters, oil storage tanks, vapor recovery compression, water softening equipment, and sand filters. All hydrocarbon pipelines crossing underneath Price Canyon Road and Pismo Creek are contained within “conductor pipelines,” which are intended to contain any oil spills that could occur from these pipelines.

The existing oil field operation can be seen from two principal viewing locations: Price Canyon Road and Ormonde Road. Many of the oil wells are visible from these two locations. Most of the other facilities described above are also visible from one or the other viewing location. It can also be seem from a few residences located about three-fourths of a mile from the site on bluff tops to the northwest. The project site, as seen from either Price Canyon Road or the residences that overlook the site, is an actively operating oilfield.

Screening vegetation (consisting of nonnative pepper trees, oak trees, eucalyptus trees, and various kinds of ground cover) only partially shields the main dehydration facility from view along Price Canyon Road.

Areas in excess of 30% slopes generally occur parallel to the Price Canyon Road corridor, framing the road with heavily wooded, north facing slopes. Two arroyos running diagonally through the area create distinctive hummocks of slopes falling to Pismo Creek. The Pismo Creek Valley Groundwater Basin follows through Price Canyon, running generally between Highway 227 to Highway 101 in Pismo Beach.

Rural lands in the Price Canyon area are primarily steep brush-covered hills. The San Luis Bay Inland Area Plan states that the “terrain, vegetation and existing development do not make this area appropriate for intensive residential uses for the short-term. During the short-term, interim agricultural uses would be appropriate, but should not preclude the proposed extraction of

resources." However, the plan states that in the "long-term, uses would be rural residential." Agricultural lands are used primarily for cattle grazing and create a scenic pastoral setting for motorists traveling along Price Canyon Road. Opportunities exist for the creation of recreational trails.

Price Canyon provides considerable scenic value due to the combination of grazing pastures, stands of mature oaks, the Pismo Creek watershed, rolling hills, and steep cliffs that are complimented by varying shades of brown, green, and gray. Although the existing oilfield interrupts scenic value of this scenic canyon, the overall aesthetic quality is relatively high.

5.3.1.1 Key Viewing Areas

The locations of key viewing areas (KVAs) from public roadways are shown in Figure 5.3-1. These KVAs represent views of the existing Plains Exploration and Production oil field operations from different vantage points along Price Canyon Road (see Figures 5.3.2 through 5.3.4). As discussed in Section 5.3.2, the proposed new well pad Maino 16NW would be visible from Price Canyon Road, and to a lesser degree, from Ormonde Road. Although the proposed new well pad Rock 85A will be located near Price Canyon Road, it will be screened from existing vegetation, including large mature trees that will be avoided during construction. The 3 new steam generators will be located at one of two possible site. One of these sites is directly behind a number of existing facilities and, thus, will not be visible from Price Canyon Road. The other is partially visible from Price Canyon Road. See Section 5.3.2 for discussion.

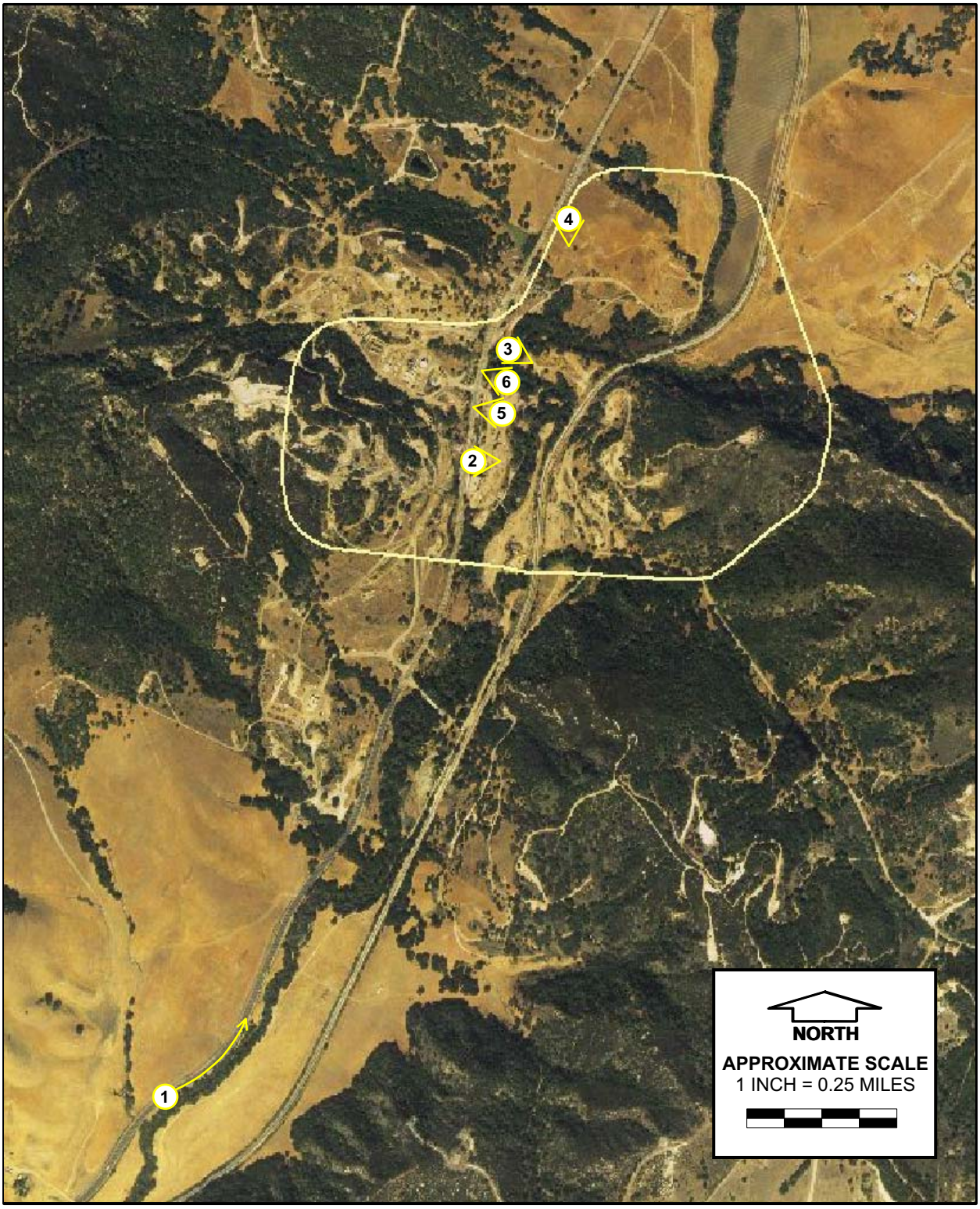
5.3.1.2 Existing Roadway Network

Principal travel corridors are important to aesthetic analysis because they define the vantage point for the largest number of viewers. The following text contains a brief description of the principal roadway segments that provide access to the study area. These roads are shown in Figure 5.2-3.

State Route 227 – is a two-lane rural highway which extends between the Cities of Arroyo Grande on the southeast and San Luis Obispo on the northwest. The segment of State Route 227 south of Price Canyon Road is generally narrow with no shoulders and a curvilinear alignment. North of Price Canyon Road, the roadway becomes straighter and widens out to provide shoulders. Access to the project site from State Route 227 is provided via the Price Canyon Road connection. The SR 227/Price Canyon Road intersection is signalized.

Price Canyon Road – is a north-south improved two-lane County road which extends from the City of Pismo Beach on the south to State Route 227 on the north. Price Canyon Road bisects the Arroyo Grande Oil Field site and provides direct access to the site at the entrance located opposite Ormonde Road. The Price Canyon Road/Ormonde Road intersection is controlled by stop signs on Ormonde Road.

Ormonde Road – is an east-west two-lane County road which crosses the Arroyo Grande Oil Field site and connects to Price Canyon Road. This road provides access to the oil field located east of Price Canyon Road and extends easterly, eventually connecting with Noyes Road.



Source: County of San Luis Obispo

padre associates, inc.
ENGINEERS, GEOLOGISTS & ENVIRONMENTAL SCIENTISTS

KEY VIEWING AREAS

FIGURE 5.3-1

KVA -1 View of Existing Facilities (and Proposed Well Pad Site Maino 16NW) from Price Canyon Road.

KVA -2 View of Existing Facilities (and Proposed Well Pad Site Maino 16NW) from Price Canyon Road

KVA -3 View of Oilfield (and site of proposed new well pads Maino 16 NW) from Price Canyon Road looking southeast.

KVA -4 View of Oilfield (and site of proposed new well pads Maino 16 NW) from Price Canyon Road looking south.

KVA -5 View of Existing Facilities from Price Canyon Road.

KVA -6 View of Proposed Rock 85A Well Pad Site

5.3.3.3 Existing Railway Network

Union Pacific Railroad - The Union Pacific Railroad tracks travel through the Price Canyon area, starting at the northern end of the project site, near Highway 227 and Corral de Piedra Road, and continuing along the southern boundary of the project site crossing over Ormonde Road. The tracks continue into the city of Pismo Beach and southward to the city of Grover Beach. Both commercial freight trains and Amtrak passenger trains travel along these tracks. Project features are visible to passengers traveling on Amtrak through the project area.

5.3.1.4 Other Roads

There are also a number of dirt roads and paths, some of which meet County road standards, throughout the Price Canyon area. Corral de Piedra, a paved road, intersects with Price Canyon Road. It provides access to Price Canyon Road for residences west of the project site.

5.3.1.5 Regulatory Setting

The primary County policy documents that govern aesthetic issues in the project areas are the Inland Area Framework for Planning, the Agriculture and Open Space Element, and the County General Plan. Refer to Chapter 4.0 for a discussion of the land use planning regulations affecting the project site and an analysis of the proposed project consistency with adopted plans and policies. Included below is a discussion the key applicable policies:

Framework for Planning – Inland Area

Evaluation of proposed extraction operations in areas having open space, scenic, habitat, recreational, or agricultural value shall balance those values against the need for extracting mineral resources from such sites (Amended 1991, Ord. 2498).

Extraction operations shall provide and be provided with adequate buffering and screening from adjacent land uses (Amended 1991, Ord. 2498).

San Luis Bay Inland Area Plan

Extraction operations must be performed in a manner that will stress re-use of the land, and protect the visual quality to the maximum extent possible. Development proposals for open pit mining to extract oil from the surface geology would not be appropriate.

Price Canyon/Ormonde Road Oilfield (EX). This [Energy and Extractive Areas Combining] designation includes those areas designated as Rural Lands. These operations should not be expanded into adjacent land use categories or existing operations intensified without full review through a public hearing process. The scenic value of the Price Canyon should also be protected as an entry to the city of Pismo Beach.

5.3.2 Impact Analysis

5.3.2.1 Thresholds of Significance

For the purposes of this EIR, a significant aesthetic impact is assumed to occur if the proposed project results in any of the following conditions:

1. Have a substantial adverse effect on a scenic vista;
2. Substantially damage scenic resources, including but not limited to: trees, rock outcroppings, and historic buildings within a state scenic highway;

3. A substantial alteration of a unique environmental or man-made visual feature; or
4. Significant light and glare impacts are those that have the capability of altering the visual resource quality of the p[project area or its surroundings.

Visual impacts were assessed through several site visits and use of maps and aerial photographs.

5.3.2.2 Short-Term Impacts

Impact AES-1: Construction of the proposed project may result in visual impacts to motorists traveling along Price Canyon Road, nearby residences, and passengers on Amtrak passenger trains traveling along the Union Pacific Railroad tracks through Price Canyon.

Discussion: Construction of the new well pads will remove existing vegetation (including large oaks) and result in exposed soils during grading. Minor slumping of cut slopes could also occur during construction. Grading and removal of existing vegetation will represent a short-term change. The four new pads will require 2.68 acres of ground disturbance and minimal to moderate grading will be required on 18 existing pads cumulatively totaling about 4.22 acres. Furthermore, presence of construction equipment will also result in short-term minor aesthetic impacts.

Low intensity, shielded, and highly efficient lighting will be used during construction. No direct beams of light to nearby residences will occur. No lighting will be required for daytime construction activities, only for night. Typically, the drilling rigs (maximum height of 90 feet) used have a built-in lighting system. Lights at the upper portion and top of the rig are fluorescent, whereas lights toward the bottom (20 feet and lower) are incandescent. Ancillary lighting equipment may used for the project during drilling. This equipment has a maximum height of 28 feet. During nighttime drilling, incandescent lights will be oriented in a manner so that no direct beams of light to nearby residences will occur.

The proposed new pad sites include Maino 16NW, Rock 85A, Signal 66C, and Signal 113A. All of the proposed new well pad sites are concealed from a motorist's field of view while traveling either direction along Price Canyon, except for Maino 16 NW. For persons in motor vehicles, normal viewing is expected to occur horizontally within a 130-degree-width-of-field centered on the direction of travel (i.e., 65 degrees to the left of center and 65 degrees to the right of center). In addition to being visible from Price Canyon Road, Maino 16NW would be visible to motorists for short durations traveling along Ormonde Road. Figures 5.3-2, 5.3-3 and 5.3.4 show views of the existing oil field operations, with emphasis on the proposed Maino 16NW well pad site. Construction at the Maino 16NW site would result in minor visual impacts. The proposed Rock 85A well pad site will be concealed from motorists traveling along Price Canyon Road through existing vegetation, including mature trees, which will be avoided. Overall, these impacts will not change the visual character of the project area and do not represent a significant impact.

Impact Category: Class 3

Thresholds of Significance: 1, 2

Mitigation Measures: Since no significant impacts were identified, no mitigation is required.

Residual Impacts

None

5.3.2.3 Long-Term Impacts

Impact AES-2: Project construction will require removal of ~~several~~ up to 46 mature coast live oaks and several Well's manzanita, which may reduce the visual quality of the project area.

Discussion: Construction of the four new pads and modifications to existing pads would require removal of ~~several~~ up to 46 mature coast live oaks and several Well's manzanita. Removal of such trees would reduce the aesthetic quality of the project site. In particular, removal of vegetation, including oaks and non-native vegetation, at the proposed Maino 16NW site would result in visual impacts, since this site is visible from multiple points along Price Canyon Road and Ormonde Road.

As described in Section 5.5, mitigation measures are recommended to mitigate impacts to oak trees due to project implementation. This includes protective measures to avoid and/or minimize impacts to oak trees designated for long-term preservation:

A. Prior to approval of a Conditional Use Permit, a Revegetation Plan containing site specific oak tree protection and replacement procedures shall be prepared for the project. The Revegetation Plan shall clearly outline the procedures for protecting oak trees to remain in place during construction and provide details for replacing oak trees that are removed at a 4:1 ratio and impacted at a 2:1 ratio. At a minimum, the plan shall contain the following provisions:

   - Utilizing the oak tree survey data collected in 2003, final project plans shall clearly illustrate the size and location of all oak trees to be removed as part of the project and all oak trees to remain within 25 feet of construction activities. Prior to any construction, grubbing or tree removal, each mature coast live oak tree within the vicinity of the subject pads shall be clearly marked for removal or protection and verified by the Planning Department (or designee);

   - Installation of protective fencing for all oak trees to remain in place. The fencing shall be installed prior to grubbing/construction and provide protection of the root zone of oak trees (the outer edge of the tree root zone is 1-1/2 times the distance from the trunk to the drip line of the tree). Compliance will be verified by the Planning Department (or designee);

   - To further protect oak trees to remain in place, a certified arborist shall be retained by the applicant to perform any necessary trimming of oak tree limbs overhanging existing well pads and newly proposed well pads. This shall be conducted prior to allowing construction equipment and drilling rigs within well pads to avoid and/or minimize the potential for inadvertent damage to oak trees limbs (i.e., from drilling rig booms, etc.). Compliance will be verified by the Planning Department (or designee);

- ~~Approximately 25% percent of the r~~Replacement oak trees shall be from ~~15-gallon stock and the remaining 75% from~~ vertical tubes or deep, one-gallon container stock. The 1~~5~~-gallon stock shall be evenly placed along the perimeter of the most visually prominent well pads as seen travelers on from Price Canyon Road (i.e., Maino 16NW);
- Replanting shall be completed in the fall season ~~as soon as feasible (i.e.,~~ upon completion of grading within a given area~~)~~ and by a qualified individual familiar with native vegetation;
- Location of newly planted oak trees should adhere to the following whenever possible: on the north side of and at the canopy/dripline edge of existing mature native trees; north-facing slopes; within drainages swales; where topsoil is present; and if clustered, at least 10' "on center" separation between each tree. Tree spacing will average approximately 15 feet on-center. Some clustering is acceptable to maintain a more natural appearance; and,
- Newly planted trees shall be maintained until successfully established. This shall include protection (e.g., caging, tree shelters) from burrowing and browsing animals (e.g., deer, rodents), regular weeding (minimum of once early Fall and once early Spring) of at least a 3-foot radius form plant base and adequate watering (i.e., drip irrigation system). Heavy mulching consisting of local oak leaf litter/mulch so seedlings are exposed to local mycorrhizal fungi to enhance survivability and growth is recommended. Irrigation shall be slowly terminated over a 3-year period. If possible, planting during the warmest, driest months (June through September) shall be avoided. Replacement oak trees identified as dead and/or diseased during the monitoring period shall be replaced accordingly.

Impact Category: Class 2

Thresholds of Significance: 1, 3

Mitigation Measures AES-2:

Mitigation measures included in Section 5.5 - Biological Resources, will reduce any impact to a level of less than significant.

Residual Impacts

None

Impact AES-3: The three new steam generators would be partially visible from Price Canyon Road.

Discussion: These generators would be located 30 feet apart on a single pad, adjacent to existing pads, at an elevation of about 160 feet above sea level. Each generator would be 77 feet long and 13 feet high, with a stack that rises another 19 feet, for a total height of 32 feet. These new generators would emit white plumes during periods of cool

and moist climate conditions and they would emit heat, so the air above the stacks may appear to shimmer.

The generators would be located at one of two possible sites (Site A and B), next to existing steam generators. See Figure 5.3-5. Site A is west of Price Canyon behind an array of existing facilities. If the steam generators were placed here, they would not be visible from motorists traveling either direction along Price Canyon Road. They would also not be visible from any residences due to intervening ridges, which screen this site from their view.

These generators would also not be visible in a motorist's normal field of view while traveling either direction along Price Canyon Road if they were located at site B east of Price Canyon Road. A "normal field of view" is the usual field of view relative to the activity engaged. For people in motor vehicles, normal viewing is expected to occur horizontally within a 130-degree width-of-field centered around the direction of travel. The steam generators would only be visible from this road if motorists turn their head to the east (the road runs roughly north-south in this area). ~~Even then, t~~The generators would be visible for only a few seconds, as motorists pass between two steep hillsides beside the road that otherwise will block their view. This location on Price Canyon Road is shown in Figure 5.3-5. Furthermore, the generators would be located approximately 1,000 feet from this point on Price Canyon Road. The steam generators will be painted with a flat green non-reflective paint that blends with the surrounding landscape of the project site. For these reasons, the visual impact of the steam generators from Price Canyon Road is not significant.

The generator site is not visible to the close residences, which are located about a half-mile to the east, off Highway 227. There appear to be seven homes grouped together in this area, which is just west of the Cold Canyon Landfill. These residences are at an elevation of about 200 feet; an intervening ridge between them and the generator site rises to about 300 feet, and would thus screen the generator site from their view.

Impact Category: Class 3

Thresholds of Significance: 1, 3

Mitigation Measures: Since no significant impacts were identified, no mitigation is required.

Residual Impacts

None

Impact AES-4: Wells drilled on new pads would increase the number of wells visible on the property.

Discussion: 95 producer wells and 30 injector wells are proposed for the Phase IV expansion. The proposed project will utilize existing pads for 90% of new wells; the four new well pads will contain the remaining 10% of the new wells. New wells on existing pads will be directionally drilled from existing wells, so there should be no long-term visual impact from these news beyond that which is already there from the existing wells. The remaining 10% would be drilled from new locations.

These wells will increase the number of wells that are visible on the property, in particular the wells that would be constructed at the proposed Maino 16NW well pad site. Except for Maino 16NW, it is not possible to determine whether such wells would be visible from either Price Canyon Road or the residences to the northwest because the exact location of the wells that would be drilled from new locations is currently not known.

Overall, the addition of up to 95 new producer wells and 30 new injector wells to a landscape that already includes about 125 producing wells, many of which are hidden by the rolling hills, may result in a decline of the scenic quality of Price Canyon.

Impact Category: Class 2

Thresholds of Significance: 1, 3

Mitigation Measures AES-4: Following drilling and construction of the well pumper units, the applicant will be required to plant native vegetation to shield/screen the new wells from a motorists traveling along Price Canyon Road. Details of such planting will be specified in the revegetation plan, which the applicant will be required to prepare prior to issuance of the Conditional Use Permit by the County (See Section 5.5 – Biological Resources). The well pumper units will be painted with a flat green non-reflective paint that blends with the surrounding landscape of the project site.

Residual Impacts

None

5.3.2.4 Cumulative Impacts

The main cumulative visual impact associated with the construction of the proposed project and the other two projects planned to occur near the project area is the effect of all three projects on the scenic quality of Price Canyon. The construction of the new well pads, modification to the existing ones, removal of mature trees, and construction of the steam generators combined with the loss of vegetation associated with the two cumulative projects would have adverse impacts to the aesthetic quality of the canyon. However, the incremental contribution of the proposed project would be small, such that the cumulative aesthetic impact is considered less than significant.

Source: County of San Luis Obispo & EDA

padre associates, inc. ENGINEERS, GEOLOGISTS & ENVIRONMENTAL SCIENTISTS

PXP Phase IV Develoment Plan EIR

STEAM GENERATOR LOCATIONS

FIGURE 5.3-5

5.4 AIR QUALITY

5.4.1 Setting

5.4.1.1 Climate and Meteorology

Coastal San Luis Obispo County is characterized by mild weather throughout the year. Due to its location near the coast, the Pacific Ocean plays a key role in moderating temperatures. Summers are mild and often characterized by early morning and afternoon fogs. Winters are usually cool and wet with the rainy season extending from late November to early April.

The nearest climatic data station to the project site is in the City of San Luis Obispo. The minimum average temperature recorded at the San Luis Obispo station from 1950 to 1980 is 41.7 degrees Fahrenheit in January. The maximum average temperature is 78.7 degrees Fahrenheit in September for the same period. The average annual rainfall, recorded from 1950 to 1980, is 23.00 inches at San Luis Obispo.

Airflow plays an important role in the movement and dispersion of air pollutants in the San Luis Obispo region. The speed and direction of local winds are controlled by 1) the location and strength of the Pacific High pressure system and other global patterns, 2) topographical factors, and 3) circulation patterns resulting from temperature differences between the land and sea.

During the spring and summer, when the Pacific High attains its greatest strength, onshore winds from the northwest generally prevail during the day. As evening approaches, onshore winds die down, and the wind direction reverses with weak winds flowing down the coastal mountains and valleys to form light easterly breezes.

In the fall, onshore surface winds decline and the marine layer grows shallow, allowing an occasional reversal to a weak offshore flow. This along with the diurnal alteration of land-sea breeze circulation, can sometimes produce a "sloshing" effect. Under such conditions, pollutants may accumulate over the Pacific Ocean and subsequently be carried back onshore with the return of sea breezes.

In the atmosphere, air temperatures normally decrease as altitude increases. At varying distances above the earth's surface, however, a reversal of this temperature gradient can occur. Such a condition, which is called an inversion, is simply a warm layer of air over a layer of cooler air. Inversions can have the effect of limiting the vertical dispersion of air pollutants, trapping them near the earth's surface.

Several types of inversions are common to the San Luis Obispo area. Weak surface inversions are caused by radiational cooling of air in contact with the cold surface of the earth at night. In valleys and low lying areas, this condition is intensified by the addition of cold air flowing down from hills and pooling on valley floors. Surface inversions are common throughout the County during winter months, particularly on cold mornings. As the morning sun warms the earth and air near the ground, the inversion lifts, gradually dissipating throughout the day.

During the summer, subsidence inversions can occur when the summertime presence of the Pacific high pressure cell can cause the air mass aloft to sink. As the air descends, compressional heating warms the air to a higher temperature than the air below. This highly stable atmospheric conditioning can act as a nearly impenetrable lid to the vertical mixing of pollutants. Subsidence inversions can persist for one or more days, causing air stagnation and the buildup of pollutants.

5.4.1.2 Air Pollution Control

Air pollution control is administered on three governmental levels in the project area. The United States Environmental Protection Agency (EPA) has jurisdiction under the Federal Clean Air Act to develop Federal air quality standards and to require individual states to prepare State Implementation Plans (SIPs) to attain these standards.

The California Environmental Protection Agency, Air Resources Board (ARB) has jurisdiction under the California Health and Safety Code and the California Clean Air Act to develop California air quality standards, to require regional plans to attain these standards, and to coordinate the preparation by local air districts of plans required by both the Federal and State Clean Air Acts. ARB is also responsible for the development of state emission standards for mobile and stationary emission sources.

The San Luis Obispo County Air Pollution Control District (APCD) shares responsibility with the ARB for ensuring that all State and Federal ambient air quality standards are attained within the County. The APCD has jurisdiction under the California Health and Safety Code to develop emission standards (rules) for the County, issue air pollution permits, and require emission controls for stationary sources in the County. The APCD is also responsible for the attainment of State and Federal air quality standards in the County.

5.4.1.3 Air Quality Standards

Air quality standards are specific concentrations of pollutants that are used as thresholds to protect public health and the public welfare. The U.S. Environmental Protection Agency (EPA) has developed two sets of standards; one to provide an adequate margin of safety to protect human health and the second to protect the public welfare from any known or anticipated adverse effects. At this time, sulfur dioxide is the only pollutant for which the two standards differ.

ARB has developed air quality standards for California, which are generally lower in concentration than the Federal standards. California standards exist for ozone, carbon monoxide, nitrogen dioxide, PM_{10}, visibility, sulfates, lead, hydrogen sulfide and vinyl chloride.

In July 1997, EPA finalized new health-based ozone and particulate matter (PM) standards. However, due to several lawsuits the standards were not fully implemented until February 2001. The new Federal ozone standard is based on a longer averaging period (8-hour vs. 1-hour), recognizing that prolonged exposure is more damaging. The new Federal PM standard is based on finer particles (2.5 microns and smaller vs. 10 microns and smaller), recognizing that finer particles may have a higher residence time in the lungs and cause greater respiratory illness. In 2002, the ARB lowered the annual standards for PM_{10} and $PM_{2.5}$ in response to the Children's Environmental Health Protection Act. Table 5.4-1 lists the applicable State and Federal air quality standards.

Table 5.4-1. Ambient Air Quality Standards

Pollutant	Averaging Time	State Standard	Federal Standard
Ozone	1-Hour	0.09 ppm	--
	8-Hour	--	0.08 ppm
Carbon Monoxide (CO)	1-Hour	20 ppm	35 ppm
	8-Hour	9.0 ppm	9.0 ppm
Nitrogen Dioxide (NO_2)	1-Hour	0.25 ppm	--
Inhalable Particulate Matter ($PM_{2.5}$)	24-Hour	--	65 ug/m3
	Annual Arithmetic Mean	12 ug/m3	15 ug/m3
Inhalable Particulate Matter (PM_{10})	24-Hour	50 ug/m3	150 ug/m3
	Annual Arithmetic Mean	20 ug/m3	50 ug/m3
Sulfur Dioxide (SO_2)	1-hour	0.25 ppm	--
	24-Hour	0.04 ppm	0.14 ppm

5.4.1.4 Effects of Air Pollution

The primary chemical compounds that are considered pollutants emitted into or formed in the atmosphere include ozone, oxides of nitrogen, sulfur dioxide, hydrocarbons, carbon monoxide, and particulate matter.

Ozone is formed in the atmosphere through a complex series of chemical reactions generally requiring light as an energy source. Ozone is a pungent, colorless gas that is a strong irritant and attacks the respiratory system. Respiratory and cardiovascular diseases are aggravated by exposure to ozone. A healthy person exposed to high concentrations of ozone may experience nausea, dizziness, and burning in the chest. Ozone also damages crops and other vegetation.

Oxides of nitrogen (NO_x) which are considered pollutants include nitric oxide (NO) and nitrogen dioxide (NO_2). NO is colorless and odorless and is generally formed by combustion processes combining atmospheric oxygen and nitrogen. NO_2 is a reddish-brown irritating gas formed by the combination of NO and oxygen in the atmosphere or at the emission source. Both NO and NO_2 are considered ozone precursors because they react with hydrocarbons and oxygen to produce ozone. Exposure to NO_2 may increase the potential for respiratory infections in children and cause difficulty in breathing even among healthy persons and especially among asthmatics.

Sulfur dioxide (SO_2) is a colorless, pungent, irritating gas which affects the upper respiratory tract. Sulfur dioxide may combine with particulate matter and settle in the lungs, causing damage to lung tissues. Sulfur dioxide may combine with water in the atmosphere to form sulfuric acid that may fall as acid rain, damaging vegetation.

Hydrocarbons include a wide variety of compounds containing hydrogen and carbon. Many hydrocarbons (known as reactive organic gases [ROG]) react with NO and NO_2 to form ozone. Generally, ambient hydrocarbon concentrations do not cause adverse health effects directly, but result in ozone formation.

Carbon monoxide (CO) is a colorless, odorless gas generally formed by incomplete combustion of hydrocarbon-containing fuels. Carbon monoxide does not irritate the respiratory tract, but does interfere with the ability of blood to carry oxygen to vital tissues.

Particulate matter consists of a wide variety of particle sizes and composition. Generally, particles less than 10 microns (PM_{10}) are considered to be pollutants because they accumulate in the lung tissues and may contain toxic materials which can be absorbed into the system.

5.4.1.5 Baseline Air Quality

San Luis Obispo County has been identified as a non-attainment area ~~for both ozone (1-hour standard) and~~ PM_{10} by the ARB. San Luis Obispo County has been designated a non-attainment area for the State 1-hour ozone standard since 1988. However, on December 5, 2003 the ARB proposed re-designating the County as attainment because no ozone violations had been recorded during 2000-2003, and that the County should be treated separately than the rest of the South Central Coast Air Basin due to minimal ozone transport associated with intervening mountain ranges. The proposed re-designation was finalized in January 2004. Maximum concentrations of other criteria pollutants are currently within Federal and State standards.

Air quality in San Luis Obispo County is currently monitored at eight public agency and private sector monitoring stations located throughout the County. The nearest station is located in Grover Beach approximately 3 miles south of the project site. However, the air quality monitored at the Marsh Street station in the City of San Luis Obispo is more representative of the project site because the location is more similar than Grover Beach (inland valley with less cloud cover and higher temperatures). The Marsh Street station is located approximately six miles north of the project site. This station monitors ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, and PM_{10} levels. Table 5.4-2 presents the maximum pollutant concentrations that were recorded at this station from 2000 through 2002. Maximum ozone levels have not exceeded the State standard at the San Luis Obispo station since 1989.

High ozone levels in San Luis Obispo County have occasionally been traced to air pollutants transported from other air basins, such as the South Coast Air Basin, the San Francisco Bay Area, and the San Joaquin Valley. The frequency with which long-range transport of pollutants affects local air quality has not been definitively established. However, most exceedances of the State ozone standard measured in the County are the result of local emissions and adverse meteorology.

5.4.1.6 Air Quality Management

The California Clean Air Act (CCAA), adopted in 1988, requires all air pollution control districts and air quality management districts in the state to adopt and enforce regulations to achieve and maintain air quality that is within the State air quality standards. San Luis Obispo County has been declared a "moderate" nonattainment area for the State ozone standard. The County did not meet the December 31, 1997 deadline to attain the State 1-hour ozone standard;

therefore, should have been reclassified as a "serious" nonattainment area. However, the ARB determined that a change in classification would not result in a more expeditious attainment of the standard. The County is also considered a nonattainment area for the State PM_{10} standard.

Table 5.4-2. Summary of Air Quality Standard Exceedances

Year	2000	2001	2002
Ozone 1-hour (ppm)			
Worst Hour	0.075	0.078	0073
Number of State Exceedances (Days > 0.09 ppm)	0	0	0
Ozone 8-hour (ppm)			
Worst 8-hour Period	0.069	0.068	0.063
Number of State Exceedances (Periods > 0.08 ppm)	0	0	0
Carbon Monoxide (ppm)			
Worst Hour	2.25	2.01	1.65
Number of State Exceedances (Hours>20 ppm)	0	0	0
Number of State Exceedances (8 hours>9 ppm)	0	0	0
$PM_{2.5}$ (micrograms/cubic meter)			
Worst Sample	28.2	25.5	20.1
Number of Federal Exceedances (Samples>65 ug/m3)	0	0	0
PM_{10} (micrograms/cubic meter)			
Worst Sample	44	39	44
Number of State Exceedances (Samples>50)	0	0	0
Annual Geometric Mean (Standard is 20)	17	17	15
Annual Arithmetic Mean (Standard is 50)	19	18	17

Source: California Air Resources Board (www.arb.ca.gov)

In response to the requirements of the CCAA, the San Luis Obispo County APCD prepared the 1991 Clean Air Plan (CAP) to provide a framework for the attainment of State air quality standards by the earliest practicable date. The CAP is a comprehensive planning document intended to facilitate attainment and maintenance of the State ozone standard. The 1995 CAP was developed as a comprehensive update to the 1991 CAP and was expected to bring the County into attainment of the State ozone standard by the end of 1997.

The 1995 CAP described the pollutants that affect County air quality, the sources of those pollutants, and future year emissions that are anticipated under current growth trends. Based on this information, the 1995 CAP also provides a control strategy for reducing emissions of ozone precursors. Included in the 1995 CAP are a number of land use and circulation management policies and programs that have already been implemented to reduce vehicular air emissions. Additional measures recommended for adoption include trip reduction programs and telecommuting.

A second update to the 1991 CAP was developed in 1998, as a continuation of the 1995 CAP and proposes no new control measures for adoption. The 1998 CAP was expected to bring the County into attainment with the State 1-hour ozone standard by 2003.

The CAP was revised again in 2001, but did not include any new emissions control measures. However, emissions of ROG and NOx are expected to decline through the year 2015, and attainment of the State ozone standard should occur in the near term. Due to the lack of recorded violations of the State 1-hour ozone standard, San Luis Obispo County was re-designated an attainment area in January 2004.

San Luis Obispo County is in attainment of the Federal air quality standards and is not subject to the planning requirements of the Federal Clean Air Act.

5.4.1.7 Existing Facilities

PXP currently operates approximately 125 production wells, an oil dehydration plant, gas processing plant, produced water reclamation plant, a casing vent recovery flare, truck loading rack, two 2,000 barrel storage tanks and six steam generators. Based on the 2002 emission inventory prepared by the APCD, these facilities emit 12.8 tons per year NOx and 12.1 tons per year ROG. In addition, PXP has recently installed a gas turbine cogeneration facility which will produce 1.4 megawatts of electricity and 950 barrels of steam. The gas turbine would be fired on purchased natural gas, and utilize a Xonon catalytic combustor to minimize NOx emissions. Emissions from this unit are estimated at 6.1 pounds per day NOx and 1.4 pounds per day ROG.

5.4.2 Impact Analysis

5.4.2.1 Thresholds of Significance

Significance thresholds have been developed by the San Luis Obispo County APCD and contained within the *CEQA Air Quality Handbook* (San Luis Obispo County APCD, 2003~~1997~~). Specifically, project emissions are considered potentially significant impacts if any of the following thresholds are exceeded:

1. Operational Impacts:

Reactive Organic Gases (ROG), NO_x, SO_2, PM_{10}	10 lbs/day
CO	50 lbs/day

The APCD considers impacts significant and requires more stringent environmental review ~~requirements~~ for projects exceeding 25 lbs/day of ROG, NO_x, SO_2 and PM_{10} emissions, or 550 lbs/day CO emissions.

2. Construction Impacts:

ROG and NO_x	185 lbs/day or 2.5 tons/quarter
PM_{10}	2.5 tons/quarter

The APCD requires Best Available Control Technology for construction equipment (CBACT) for projects with ROG or NOx emissions between 2.5 and 6.0 tons per quarter and requires CBACT plus further mitigation for projects with emissions exceeding 6.0 tons per quarter.

3. Consistency:

Large projects must be found to be consistent with the District's Clean Air Plan (CAP). The APCD notes that a consistency analysis is required for the following types of projects: general plan updates and amendments, specific plans, area plans, large residential subdivisions and large commercial/industrial developments. The proposed project is not one of the types listed; therefore, a CAP consistency analysis is not required.

4. Health Risk:

The APCD has established health risk threshold values under the Air Toxics "Hot Spots" Information and Assessment Act. These values trigger community notification and a risk reduction plan.

Cancer Risk: 10 in a million lifetime cancer risk (continual 70 year exposure);

Non-Cancer Acute Hazard: acute hazard index greater than or equal to 1.0 (sum of acute hazard hourly index of each pollutant with similar adverse health effects); and

Non-Cancer Chronic Hazard: chronic hazard index greater than or equal to 1.0 (sum of chronic hazard annual index of each pollutant with similar adverse health effects).

5. Odors:

APCD Rule 402 states "A person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property." Violation of Rule 402 is considered a significant impact.

5.4.2.2 Short-Term Impacts

Impact AQ-1: Construction activity would generate air emissions that may adversely impact local and regional air quality.

Discussion: The emissions of construction equipment and vehicles would be short-term and consist of fugitive dust and exhaust emissions. A peak day and peak quarter construction emissions inventory was prepared for comparison to the thresholds of significance (see Appendix D).

Construction would generally consist of well pad grading, well drilling and installation, piping installation and steam generator installation. Based on installing up to 40 production wells per year (see Section 3.5.1), it was assumed that 10 wells would be drilled in a peak quarter, along with three injection wells. It was assumed that a well pad would be graded in one day, a production well would be drilled in 4 days, and a injection well would be drilled in one day.

Engines driving well drilling equipment are expected to be registered under the Statewide Portable Equipment Registration Program. Engines manufactured prior to

1996 must not emit greater than 10.5 grams per horsepower hour NOx (50-166 horsepower) or 10.0 grams per horsepower-hour (117-399 horsepower). Therefore, these emission factors were used to calculate emissions from engines used to power drilling equipment (draw-works, mud pump, generator, mud cleaner, conductor winch).

Construction equipment emissions were estimated using emission factors from EPA documents *Compilation of Air Pollutant Emission Factors (AP-42)* (1995a) and *Nonroad Engine and Vehicle Emission Study* (1991). Vehicle trip generation estimates were taken from the Traffic and Circulation Study prepared for the project by Associated Transportation Engineers (2001), which indicates 40 daily one-way trips would be required for construction worker transportation and 48 daily one-way trips would be required for materials deliveries. Motor vehicle emissions were estimated using the ARB EMFAC2002 model using emission-specific data for San Luis Obispo County, summer 2004. Speed and temperature inputs were consistent with the CEQA Air Quality Handbook (San Luis Obispo County Air Pollution Control District, 2003~~1997~~).

Construction emissions would exceed the APCD's daily and quarterly significance thresholds for NO_x and PM_{10} and are considered a significant impact to regional air quality (see Table 5.4-3).

Impact Category: Class 2

Threshold of Significance: 2

Table 5.4-3. Construction Emissions Estimates

Source	ROG		NO_x		PM_{10}	
	Pound/day	Ton/quarter	Pound/day	Ton/quarter	Pound/day	Ton/quarter
	Pad Grading – Equipment					
Tracked tractor	2.9	0.01	~~33.6~~31.5	0.06~~0.07~~	~~1.5~~1.2	0.00
Motor grader	2.2	0.00	~~15.4~~14.4	0.03	~~0.7~~0.06	0.00
Compactor	0.9	0.00	~~9.4~~8.9	0.02	~~0.5~~0.04	0.00
	Well drilling – Equipment					
Draw-works	~~11.6~~7.7	~~0.25~~0.17	~~92.9~~53.4	~~2.00~~1.15	~~5.8~~3.1	~~0.12~~0.07
Mud pump	7.6	0.16	~~68.0~~78.2	~~1.46~~1.68	~~3.8~~3.0	~~0.08~~0.07
Generator	7.3	0.16	~~65.5~~75.3	~~1.41~~1.62	~~3.6~~2.9	~~0.08~~0.06
Mud cleaner	2.0	0.04	~~18.1~~21.8	~~0.39~~0.47	~~1.0~~0.8	0.02
Backhoe	1.4	0.03	~~15.9~~15.0	~~0.34~~0.32	~~1.0~~0.8	0.02
Conductor winch	1.8	0.04	~~16.2~~19.5	~~0.35~~0.42	~~0.9~~0.7	0.02
	Piping Installation – Equipment					
Welder	0.5	0.01	~~4.1~~3.8	~~0.09~~0.08	0.2	0.00
Crane	2.4	0.05	~~18.2~~17.1	~~0.39~~0.37	~~1.2~~0.9	~~0.03~~0.02
Backhoe	0.6	0.01	~~7.1~~6.7	~~0.15~~0.14	~~0.5~~0.4	0.01
All vehicle types	**Motor Vehicles (material deliveries and worker transportation)**					

	2.4	0.08	30.5	0.99	0.2	0.01
	Fugitive Dust					
Vehicles and wind erosion	0.0	0.00	0.00	0.00	~~315.5~~194.4	~~4.04~~3.79
SUM	**~~43.6~~39.7**	**~~0.85~~0.76**	**~~395.0~~376.0**	**~~7.69~~7.35**	**~~336.4~~209.6**	**~~4.44~~4.07**
Significance Thresholds	**185**	**2.5**	**185**	**2.5**	**185**	**NA**

Mitigation Measure AQ-1:

A. Equipment Emission Control Measures. ~~Drilling equipment emissions shall be reduced through the installation of a NOx reducing catalyst/catalyzed diesel particulate filter system (cleaire Longview, or equivalent) on the draw-works, mud pump and generator engines. This system uses diesel fuel as a reducing agent, where it is drawn from the engine fuel supply, pressurized, filtered and injected into the exhaust pipe where it reacts with the NOx reducing catalyst. The catalyzed diesel particulate filter eliminates any unreacted diesel fuel. The Longview system is ARB verified for on-road use and is easily installed on stationary industrial engines such as the draw-works engine. This measure would reduce NOx and ROG emissions by about 16 and 50 percent, respectively (assumes 25 percent NOx and 65 percent ROG emissions reduction of catalyst-equipped engines).~~ Prior to construction, ~~A~~a Drilling Emissions Reduction and Monitoring Plan shall be developed, approved by the County and fully implemented. The Plan shall specify the emissions control measures to be implemented on each emission source, the expected reduction for each criteria pollutant, the period the emissions control measures are to be in place, and a quarterly summary of the emissions reductions. The summary shall include sufficient information for the APCD to verify the emissions reductions have occurred. Potential emission reduction measures may include:

- Use of well pad construction and drilling scenarios to reduce peak emissions;
- Use of engines meeting the Tier 1 or 2 Federal emissions standards for non-road applications;
- Installation of diesel oxidation catalysts (up to 25 percent NOx reduction);
- Installation of diesel reduction catalyst/catalyzed diesel particulate filter system (25 percent NOx reduction);
- Use of PuriNOx fuel by Lubrizol (14 percent NOx reduction);
- Use of Aquazole fuel (14 percent NOx reduction); and
- Use of water-emulsified diesel fuel by Clean Fuels Technology (15 percent NOx reduction).

B. Dust Control Measures. Dust generated by construction activities shall be kept to a minimum by full implementation of the following measures.

- During clearing, grading, earth moving, excavation, or transportation of cut or fill materials, water trucks or sprinkler systems shall be used to prevent dust from leaving the site and to create a crust after each day's activities cease;
- During construction, water trucks or sprinkler systems shall be used to keep all areas of vehicle movement damp enough to prevent dust from leaving the site. At a minimum, this would include wetting down such areas in the morning and after work is completed for the day and whenever wind exceeds 15 miles per hour;
- Stockpiled earth material shall be sprayed as needed to minimize dust generation.
- During construction, the amount of disturbed area shall be minimized, and onsite vehicle speeds should be reduced to 15 mph or less;
- Exposed ground areas that are planned to be reworked at dates more than one month after initial grading should be sown with a fast-germinating native grass seed and watered until vegetation is established;
- After clearing, grading, earth moving, or excavation is completed, the entire area of disturbed soil shall be treated immediately by watering or revegetating or spreading soil binders to minimize dust generation until the area is paved or otherwise compacted so that dust generation is minimized;
- Grading and scraping operations shall be suspended when wind speeds exceed 20 mph (one hour average);
- Rumble pads (minor road obstructions designed to dislodge accumulated earth material from trucks) with spray washers shall be installed and maintained at all construction entrances; and
- All roadways associated with construction activities should be paved as ~~soon~~ efficiently as possible.

C. Emission Offsets. Project emissions remaining following implementation of the above mitigation measures shall be offset through contribution to an off-site mitigation fund. The fund is managed by the APCD and used to finance regional emission reduction projects such as bikeways, vehicle scrapping programs, diesel bus conversions, agricultural engine replacements and similar activities. Therefore, project emissions would be offset on a regional basis through applicant-funded off-site projects that would result in emissions reductions. Based on past experience the APCD has determined that $8,500 is required per ton NOx reduced. These funds would be used by the APCD to purchase clean-burning engines and other equipment/facilities that would result in a decrease in emissions in the County. The financial contribution would be paid on a per well basis, based on the number of wells to be drilled during a known period. The dollar amount shall be based on offsetting excess emissions (greater than 2.5 tons NOx per quarter) at~~,~~ $8,500 per ton ~~and 0.65 tons NOx per well~~.

Residual Impacts

NOx and fugitive dust emissions can feasibly be reduced below the threshold of significance; therefore, impacts are significant, but mitigable.

Impact AQ-2: Diesel fuel combustion associated with project construction activity would generate emissions of toxic air contaminants.

Discussion: The combustion of diesel fuel in truck engines (as well as other internal combustion engines) produces exhaust containing a number of compounds that have been identified as hazardous air pollutants by EPA and toxic air contaminants by the ARB. Particulate matter (PM) from diesel exhaust has recently been identified as a toxic air contaminant, which has prompted ARB to develop a Final Risk Reduction Plan (released October 2000) for exposure to diesel PM. Based on ARB Resolution 00-30, full implementation of emission reduction measures recommended in the Final Risk Reduction Plan would result in a 75 percent reduction in the diesel PM Statewide inventory and the associated cancer risk by 2010, and an 85 percent reduction by 2020 in the diesel PM inventory and potential cancer risk.

The emissions of construction equipment and vehicles would be short-term, as new wells are drilled and brought into production. Diesel PM emissions would be up to 15.2 pounds per day (PM10 in Table 5.4-3 less fugitive dust). These emissions would be much less than the APCD 185 pounds per day threshold and would be controlled by State requirements in the long-term. Therefore, construction-related diesel PM emissions are considered a less than significant impact.

Impact Category: Class 3

Threshold of Significance: 2

Mitigation Measures:

No mitigation is required.

Impact AQ-3: Fugitive dust generated by construction activity may contain asbestos and result in exposure of the public to this toxic air contaminant.

Discussion: The project site is located within the Pismo Formation, a sedimentary geologic unit, which is not expected to include ultramafic or asbestos-containing materials. According to the County Geologist, the potential for encountering asbestos-containing materials is very low.

Impact Category: Class 3

Threshold of Significance: 4

Mitigation Measures:

No mitigation is necessary

5.4.2.3 Long-Term Impacts

Impact AQ-~~4~~2: Operation of the proposed oil production facilities would result in NOx and ROG emissions from steam generators and tanker trucks that may adversely affect local and regional air quality.

Discussion: Emissions from steam generators were calculated based on the "potential to emit", meaning that all three proposed 50 million Btu/hour steam generators would operate at full load on a peak day. It was assumed that the steam generators would comply with the requirements of APCD Rule 430, 0.036 pound NOx per million Btu and 400 ppm CO @ 3% excess oxygen. ROG and toxic air emissions were calculated using emission factors from Section 1.4 (Natural Gas Combustion) of *Compilation of Air Pollutant Emission Factors (AP-42)* (EPA, 1998). Increased oil production would result in an increase in the number of tanker truck trips and associated emissions. Emissions from increased tanker truck trips are estimated as 18.8 pounds NOx per day, based on 25 additional trips per day and emission factors from the EMFAC2002 model.

Peak day emissions for the steam generators and tanker trucks would exceed the significance threshold for NOx, ROG and CO and are considered a significant impact (see Table 5.4-4).

Impact Category: Class 2

Threshold of Significance: 1

Mitigation Measure AQ-~~4~~2:

A. The proposed steam generators would be lo-NOx designs and comply with APCD Rule 430. No further emission controls are considered feasible. However, emissions can be offset through the contribution to an off-site mitigation fund to finance regional emission reduction projects such as bikeways, diesel bus conversions, agricultural engine replacements and similar activities.

B. Alternatively, the project proponent may elect to reduce emissions from existing steam generators and other fuel burning equipment such as heater treaters, tank heaters and glycol reboilers. Emissions could reduced to a level of less than significant through a combination of these measures.

Residual Impacts

NOx emissions can feasibly be reduced below the threshold of significance; therefore, impacts are significant, but mitigable.

Impact AQ-~~5~~3: Operation of the proposed oil production facilities would result in fugitive emissions from valves, flanges and other components associated with well production.

Discussion: Fugitive emissions consist of oil or gas leaks from valves, flanges, pump seals, compressor seals, pressure relief devices, hatches, sight-glass fittings, meters or open ended lines.

Fugitive hydrocarbon emissions are typically estimated by counting the number of each type of component (e.g., valves, flanges, etc.) in each service (gas, light liquid, heavy liquid) and applying emission factors from the California Implementation Guidelines for

Estimating Mass Emissions of Fugitive Hydrocarbon Leaks at Petroleum Facilities developed by CAPCOA and the ARB (1999). ~~However, component counts and service type information for the proposed wells and associated facilities is not available.~~

Table 5.4-4. Steam Generator Peak Day Emissions Estimates

Pollutant	Peak Day Emissions (lbs)	Cancer Risk*	Non-Cancer Health Risk
NOx	129.6	No	No
CO	1044.0	No	No
VOC	19.8	No	No
2-methlynaphthalene	0.00086	No	Yes
Benzene	0.0076	Yes	Yes
Dichlorobenzene	0.0043	Yes	Yes
Flouranthene	0.000011	No	Yes
Flourene	0.000010	No	Yes
Formaldehyde	0.27	Yes	Yes
Hexane	6.48	No	Yes
Naphthalene	0.022	No	Yes
Phenanathrene	0.00006	No	Yes
Pyrene	0.00002	No	Yes
Toluene	0.012	No	Yes
Arsenic	0.0007	Yes	Yes
Cadmium	0.0040	Yes	Yes
Chromium	0.0050	Yes	Yes
Cobalt	0.00030	No	Yes
Manganese	0.0014	No	Yes
Mercury	0.00094	No	Yes
Nickel	0.0076	Yes	Yes

*Inhalation cancer potency factors have been established by the ARB or EPA

~~Therefore, e~~Emission factors based on the number of wells were taken from Emission Inventory Guidance Section 4.2 Oil & Gas Production Valves and Fittings (ARB, revised 1990) and used to estimate fugitive hydrocarbon emissions. Section 4.2 includes oil lease models based on the number of wells per lease and the gas-oil ratio. The proposed project is consistent with model 6; meaning the number of wells on the lease is greater than 50 and the gas-oil ratio would be greater than 500 cubic feet gas per barrel of oil (Arroyo Grande Field gas-oil ratio is 789 cubic feet per barrel). Uncontrolled fugitive ROG emissions associated with oil production from 95 new wells is estimated as

412.2 pounds per day. These long-term ROG emissions in combination with steam generator ROG emissions would exceed the significance threshold.

Impact Category: Class 2

Threshold of Significance: 1

Mitigation Measure AQ-~~5~~3: The applicant is fully implementing the requirements of Rule 417, ~~The proposed project shall fully implement the provisions of APCD Rule 417,~~ which requires quarterly monitoring for leaks, and repair of leaks completed with 14 days for minor gas leaks, 5 days for major gas leaks and 2 days for liquid leaks. Based on Table 5-3 of Protocol for Equipment Leak Emission Estimates (EPA, 1995b) it was assumed than full implementation of the requirements of Rule 417 would result in at least a 61 percent reduction in fugitive hydrocarbons. ~~Therefore, the controlled fugitive ROG emission rate for the proposed facilities would be 160.8 pounds per day.~~ Project ROG emissions could be reduced further as discussed above under Mitigation Measure AQ-4~~2~~.

Impact AQ-6~~4~~: Toxic air contaminants contained with steam generator exhaust and fugitive hydrocarbon emissions may result in unacceptable human health risk.

Discussion: The proposed steam generators may combust landfill gas (in part) which may result in emissions of toxic air contaminants not listed in Table 5.4-4, such as vinyl chloride and perchloroethylene. Fugitive hydrocarbon emissions would also include toxic air contaminants such as benzene, toluene and formaldehyde. The cancer and non-cancer health risk to surrounding residences associated with emissions of toxic air contaminants may exceed the APCD's risk threshold values. In the absence of a comprehensive health risk assessment, it is assumed that toxic air emissions are a significant impact to local air quality.

PXP recently conducted a HRA (see Appendix D) for the proposed project based on a previous HRA that was provided to APCD in December 2002 for a turbine generator project at the oil facility. This HRA utilized a 1994 corrected meteorological data set and the HAP model and included the following modeling analyses:

Case 1: Base case emissions from existing sources;

Case 2: Base case with facility well emissions doubled (representative of the proposed expansion); and,

Case 3: Base case with all facility source emissions doubled (simulating post-2006 with all steam generators operating).

The modeling results demonstrate cancer risk values well below the cancer risk threshold (regulatory limit for cancer risk is 1.0E-06) by a factor of 10-20. In addition, all acute and chronic risk are well below the APCD Rule 219.E.3 and Rule 219.E.4 risk factor thresholds of 1.0 for sources with Toxics Best Available Control Technology (T-BACT).

Therefore, the health risks associated with the proposed project will most likely not result in unacceptable human health risks. This will be further verified through permitting with the APCD and the subsequent HRA discussed in measure AQ-6.

Impact Category: Class 2

Threshold of Significance: 4

Mitigation Measure AQ-64: As part of permitting for the proposed steam generators (New Source Review), the APCD would require the project proponent to complete a comprehensive facility-wide health risk assessment (HRA) according to the Emission Inventory Criteria and Guidelines for the "Hot Spots" program. The Assessment would include a facility-wide inventory of toxic air contaminants (including sulfur compounds), air dispersion modeling to determine ground-level concentrations at adjacent residences and application of unit risk factors to identify cancer and non-cancer health risk. Should the results of the health risk assessment indicate unacceptable health risk, mitigation measures may be required to reduce health risk by reducing ground-level concentrations of toxic air contaminants, such as:

1. Limiting simultaneous operation of steam generators; and
2. Limiting use of landfill gas as fuel.

~~•Increasing exhaust stack height of the steam generators to increase dispersion;~~

Residual Impacts

Health risk can feasibly be reduced below the threshold of significance; therefore, impacts are significant, but mitigable.

Impact AQ-7. The impact of odors from the expansion of the oil production is an air quality issue.

Discussion: The APCD has received odor complaints allegedly attributable to the oil facility. Odors may be related to hydrogen sulfide and other sulfur compounds dissolved in crude oil that are released during oil production activities. Odors from this facility occur from a variety of sources and compounds, including (1) H_2S that occurs in crude oil and natural gas and is emitted as part of fugitive TOC, (2) SO_2 emissions from natural gas-burning, and (3) upset conditions, or accidents, such as unburned natural gas (TOC and H_2S) from emergency flaring. Additionally, natural sources of odors in Price Canyon complicate the issue: (1) TOC and H_2s from natural oil seeps, and (2) H_2S from hot water springs.

The applicant will adhere to APCD Rule 417 and control VOC emissions from all valves, flanges, and components. As a result, TOC emissions (with its associated H_2S emissions) from fugitive sources would decrease. Therefore, odors impacts could slightly decrease in the vicinity of the project site under normal operating conditions. Furthermore, as discussed in Section 5.10.1 and shown in Figure 5.10-1, the oilfield is operated in a negative balance, whereby the total fluid injected is less than the total fluid produced, thereby reducing the internal reservoir pressure. This will reduce the likelihood of natural emissions of natural gas (TOC and H_2S).

Impact Category: Class 3

Threshold of Significance: 5

Mitigation Measure AQ-7. While no mitigation is required, an Odor Monitoring and Complaint Response Plan may be developed, approved by the APCD and fully implemented. The Plan may include the following elements:

- Screening program of employees for olfactory acuity to identify odor monitors, using a series butanol/water solutions;
- Training program for odor monitors to recognize odors and identify problem areas (unusually strong odors);
- Protocol to investigate odors identified by employees, including enhanced fugitive hydrocarbon monitoring and follow-up olfactory monitoring;
- Procedures to reduce identified odors through equipment maintenance, equipment replacement, operating procedures or specific odor controls;
- Procedures to respond to odor complaints including responsible employees, collection of process data, meteorological data, olfactory monitoring data, data analysis and reporting back to the APCD; and
- Contingency measures to address chronic odor complaints which may include collection of samples for laboratory analysis or dilution-to-threshold equipment (Scentometer, or equivalent) to quantify odors and more precisely identify sources.
- Utilization of monitoring equipment.

Residual Impacts

Less than significant

5.4.2.4 Cumulative Impacts

As discussed in Section 8.2 of this EIR, cumulative projects include King South Ranch and Tentative Tract Map no. 2388 which would result in the development of low density residential land uses, a hotel, golf course and vineyards. These land uses would result in air emissions associated with construction equipment, motor vehicle use (visitors and residents), agricultural equipment use, golf course maintenance equipment use and space heating. These air emissions would exacerbate the air quality impacts of the proposed project. However, these cumulative impacts would not alter the significance of air quality impacts of the project.

5.5 BIOLOGICAL RESOURCES

The purpose of this section is to assess potential impacts to biological resources associated with the proposed Plains Exploration and Production (PXP) Arroyo Grande oil field Phase IV Development Project, located directly east and west of Price Canyon Road in San Luis Obispo County. This section includes a review of pertinent literature and field surveys, the results of coordination with resource agencies, discussion and analysis of pertinent regulatory requirements, and an assessment of the impacts of the Proposed Project on biological resources.

5.5.1 Regulatory Setting

This section identifies those plans and policies administered by resource agencies pertaining to those biological resources that are known to exist and/or have the potential to occur within the project area.

5.5.1.1 Special–Status Species

Federal Authority. The Federal Endangered Species Act (FESA), administered by the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS), provides protection to species listed as Threatened (FT) or Endangered (FE), or proposed for listing as Threatened (PFT) or Endangered (PFE). In addition to the listed species, the Federal government also maintains lists of species that are neither formally listed nor proposed, but could potentially be listed in the future. Federal candidate species (FC) include taxa for which substantial information on biological vulnerability and potential threats exist, and are maintained in order to support the appropriateness of proposing to list the taxa as an endangered or threatened species. Federal Species of Concern (FSC) comprise those species that should be given consideration during environmental review.

Section 9 of the FESA prohibits the "*take*" of any member of a listed species. Take is defined as, "…*to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.*" Harass is "*an intentional or negligent act or omission that creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavior patterns that include, but are not limited to, breeding, feeding, or sheltering.*" Harm is defined as "…*significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering.*"

Projects that would result in the take of a Federally listed or proposed species are required to consult with USFWS or NMFS. The objective of consultation is to determine whether the project would jeopardize the continued existence of a listed or proposed species, and to determine what mitigation measures would be required to avoid jeopardy.

Consultations are conducted under Sections 7 or 10 of FESA depending on the involvement by the Federal government. Section 7 requires agencies to make a finding on all Federal actions, including the approval by an agency of a public or private action, such as the issuance of a permit pursuant to Section 10/404 of the Clean Water Act, on the potential to jeopardize the

continued existence of any listed or proposed species potentially impacted by the action. Section 10 is conducted when there is no Federal involvement in a project except compliance with FESA.

Under Section 7, the USFWS and NMFS are authorized to issue Incidental Take Permits (ITP) for the take of a listed species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency. The ITP includes measures to minimize the take. Under Section 10(a), the USFWS and NMFS can issue ITPs for non-Federal projects.

The USFWS also administers the Federal Migratory Bird Treaty Act of 1918 (16 USC 703-711). Under the MBTA, it is unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed in 50 CFR 10, including feathers or other parts, nests, eggs or products, except as allowed by implementing regulations (50 CFR 21).

State Authority. The California Department of Fish and Game (CDFG) administers a number of laws and programs designed to protect fish and wildlife resources. Principal of these is the California Endangered Species Act of 1984 (CESA - Fish and Game Code Section 2050) that regulates the listing and take of State endangered (SE) and threatened species (ST). Under Section 2081 of CESA, CDFG may authorize the take of an Endangered and/or Threatened species, or candidate species by a permit or Memorandum of Understanding (MOU) for scientific, educational, or management purposes.

CDFG maintains lists of Candidate-Endangered species (SCE) and Candidate-Threatened species (SCT). California candidate species are afforded the same level of protection as listed species. CDFG also designates Species of Special Concern (CSC) that are species of limited distribution, declining populations, diminishing habitat, or unusual scientific, recreational, or educational value. These species do not have the same legal protection as listed species, but may be added to official lists in the future. The CSC list is intended by CDFG as a management tool to call attention to declining populations and focus efforts on decreasing threats to long-term viability.

CDFG administers other State laws designed to protect wildlife and plants. Under Section 3511 of the Fish and Game Code, CDFG designates species that are afforded “fully protected” (FP) status. Under this protection, designated species can only be taken or possessed with a permit. Section 3503 of the Fish and Game Code protects all birds-of-prey, their eggs, and their nests.

CDFG manages the California Native Plant Protection Act of 1977 (Fish and Game Code Section 1900, et seq), which was enacted to identify, designate and, protect rare plants. In accordance with CDFG guidelines, California Native Plant Society (CNPS) 1B list plants are considered “rare” under the Act, and are evaluated in California Environmental Quality Act (CEQA) reports.

Local Authority. Special-status species of the project area are afforded protection by the County of San Luis Obispo under goals and polices contained in the County of San Luis Obispo General Plan, Agriculture & Open Space Element (1998) and the San Luis Bay Area Inland Planning Area Plan (2002). These documents provide a framework of policies designed to

protect special-status species and sensitive habitat areas. Project-related adverse impacts on special-status species are considered significant for CEQA purposes.

5.5.1.2 Waters and Wetlands

Federal Authority. The Corps is responsible for the issuance of permits for the placement of dredged or fill material into waters of the United States (waters) pursuant to Section 404 of the Clean Water Act (33 USC 1344). As defined by the Corps at 33 CFR 328.3(a)(3), waters are those that are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; tributaries and impoundments to such waters; all interstate waters including interstate wetlands; and territorial seas. (Note: Based on the recent U.S. Supreme Court decision in *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers* [2001], and guidance from the U.S. Army Corps of Engineers and U.S. Environmental Protection Agency [2001], the Federal government no longer asserts jurisdiction over isolated waters and wetlands under Section 404 of the Clean Water Act based on the ”migratory bird rule.” Further guidance on the issue of isolated wetlands and waters is expected (U.S. Army Corps of Engineers, 2001).

Wetlands are a special category of waters, and are defined at 33 CFR 328.3(b) as: “...*those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas*.”

In non-tidal waters, the lateral extent of Corps jurisdiction is determined by the ordinary high water mark (OHWM), which is defined as the: “…*line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas*.” (33 CFR 328[e]).

In addition, a wetland definition has been adopted by the U.S Fish and Wildlife Service to include both vegetated and non-vegetated wetlands, recognizing that some types of wetlands may lack vegetation (e.g., mudflats, sandbar, rocky shores, and sand flats), but still provide functional habitat for fish and wildlife species (Cowardin, et al., 1979). These wetlands are defined as “…*lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. For purposes of this classification, wetlands must have one or more of the following three attributes: (1) at least periodically, the land supports predominantly hydrophytes; (2) the substrate is predominantly undrained hydric soil; and (3) the substrate is non-soil and is saturated with water or covered by shallow water at some time during the growing season of each year.*" Some of the USFWS-defined wetlands are not regulated by the Federal government.

The upper (landward) limit of USFWS-defined wetlands are the boundary between land with predominantly hydrophytic cover and land with predominantly mesophytic or xerophytic cover; the boundary between soil that is predominantly hydric and soil that is predominantly non-hydric; or in the case of wetlands without vegetation or soil, the boundary between land that is

flooded or saturated at some time each year and land that is not (Cowardin et al., 1979). The lower limit in inland areas is established at a depth of 6.6 feet below the water surface; unless emergent plants, shrubs, or trees grow beyond this depth, at which the deepwater edge of such vegetation is the boundary (Cowardin et al., 1979).

State and Local Authority. Pursuant to Section 1601 of the California Fish and Game Code, CDFG requires a streambed alteration agreement (SAA) between CDFG and any State or local governmental agency or public utility before the initiation of any construction project that will: 1) divert, obstruct, or change the natural flow or the bed, channel, or bank of any river, stream, or lake; 2) use materials from a streambed; or 3) result in the disposal or deposition of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into any river, stream, or lake.

The California Fish and Game Commission adopted a modification of the USFWS definition of wetlands on March 9, 1987 as its principal means of wetland identification in conjunction with on-site inspections for implementation of the Fish and Game Commission's policy (Rollins, 1987). Unlike USFWS, the CDFG definition only requires the presence of one wetland indicator for an area to qualify as a wetland. CDFG does not have a wetland regulatory program, but advises other state agencies on wetland issues.

County of San Luis Obispo General Plan, Agriculture & Open Space Element identifies a series of unique plant or animal habitats including the following: habitat of rare, endangered or threatened plant or animal species as classified by state and Federal agencies and the California Native Plant Society (CNPS); wetlands and marshes; and sensitive natural communities as identified in the California Department of Fish and Game Natural Diversity Data Base (such as Central maritime chaparral).

The importance of wetlands has long been recognized in the San Luis Obispo County General Plan. However, there is no inventory of the wetland resources in the County, so the identification and protection of these resources most often occurs when a development proposal is submitted on property that may include a wetland.

5.5.2 Setting

The following description of the biological setting is based on a review of pertinent literature and field reconnaissance surveys of the project site. The literature review included the examination of the following documents:

- PXP Arroyo Grande Oil Field Phase IV Development Project Plan application and available project plans (County of San Luis Obispo);
- Final Environmental Impact Report (EIR), Phase II Operations Arroyo Grande Thermal Project, Grace Petroleum Corporation ED 79-201 (Energy Resources Company, Inc., 1981);
- Shell Western Development Plan, Phase III Expansion of the Arroyo Grande Oilfield, Final Supplemental EIR (SAIC, 1994);

- Sensitive Species Surveys for Stocker Resources Facility Expansion, Price Canyon, San Luis Obispo, California (LFR, 2000);

- Stocker Resources, Inc. Final Assessment of Coast Live Oak and Well's Manzanita Impacts for Focused Well Pad Botanical Surveys for Proposed Expansion Activities (LFR, 2002); and,

- USGS 7.5-minute topographical maps.

In addition, the California Natural Diversity Database (CNDDB) was queried for records of special-status species within the Pismo Beach and Arroyo Grande NE 7.5 minute quadrangle maps (CDFG, 2003). The categories of special-status species are listed in Tables 5.5-2 and 5.5-4 and the CNDDB report is included under Appendix E. Special-status taxa that are known to exist or have the potential to exist on the project sites were also identified through a review of relevant literature (California Native Plant Society, 2001; and Zeiner et al., 1988; 1990a, b), and previous biological studies in the area (Energy Resources Company, 1981; SAIC, 1994; Levine Fricke 2000, 2002). Further, a list of Federally threatened and endangered species potentially occurring within the area was also obtained from the USFWS (see Appendix E).

Field reconnaissance surveys were conducted at the project site for the purpose of identifying vegetative communities, determining typical species associated with the vegetative communities, identifying and assessing potentially impacted oak trees, and to document occurrences of special-status species and habitats. This included a focused spring botanical survey of all project impact areas, including road cuts and openings, margins and interiors of proposed wells pads, and large open habitat areas (i.e., adjacent grasslands, etc.).

Field surveys for wildlife were conducted by walking transects of opportunity through habitat types and recording species observed based on visual observation using 8X40 binoculars, auditory cues (calls and songs), and indirect signs (tracks, scat, skeletal remains, burrows, etc.).

California coast live oaks (*Quercus agrifolia*), although not considered to be a sensitive species, represent an essential component of coast live oak woodland, a habitat that is increasingly threatened by development and agriculture along the central California coast. As such, focused oak tree surveys were conducted to identify those oak trees which could potentially be affected by project activities at each well site. Trees surveyed were limited to living oak trees located within or immediately adjacent to designated potential impact areas, including those trees expected to be completely removed and/or impacted as a result of new pad installation. Surveys included a measurement of oak tree diameter at breast height (DBH) and an overall assessment of tree structure, health, and vigor which were recorded on field observation forms (see Appendix E). Additionally, all oak trees were numbered and mapped accordingly. Physical data was collected only on those oak trees considered mature and all saplings were mapped as components of coast live oak woodland habitat. Specifically, oaks classified as mature were greater than 10 cm (3.93 in.) DBH and oaks classified as saplings were less than 10 cm DBH. The following Table 5.5 -1 lists the field surveys performed and the dates they were conducted.

Table 5.5-1
Field Survey Dates

Field Survey Type	Dates Conducted
Botanical	May 1 & 8, 2003
Wildlife	May 1 & 8, 2003
Oak Tree	Aug. 15 & 29, and Sept. 26, 2003

5.5.2.1 Physical Setting

The project area is located approximately two miles north of the City of Pismo Beach along Price Canyon Road in central San Luis Obispo County. The site is situated within the Outer South Coast Range district of the Central Western California floristic province (Hickman, 1993).

Vegetation. Comprehensive botanical field surveys were conducted by Padre biologists on May 1 and 8, 2003, within the typical spring flowering season of this floristic province (April-May). Based on the results of the botanical field surveys conducted by Padre personnel and results from previous botanical studies of the project area (LFR, 2000 & 2002), a list of plant species was compiled (see Appendix E) and a map of vegetative communities occurring in the project area was generated (refer to Figure 5.5-1). A total of 156 vascular plant species were identified during the field survey, which consisted of 86 (55 percent) native taxa and 70 (45 percent) non-native naturalized taxa. The percentage of non-native taxa is greater than for the State as a whole (17.4 percent), reflecting the relatively high level of disturbance associated with well site development and continuing operation and maintenance activities throughout the oil field.

The project site encompasses seven generalized vegetative communities: California Annual Grassland Series, Coyote Brush Series, Well's Manzanita Series, Chamise Series, California Live Oak Woodland Series, Riparian Woodland, and ruderal (disturbed) habitat. Classification of these habitat types or vegetation communities is based primarily on Sawyer and Keeler-Wolf (1995) with several modifications to more accurately characterize existing conditions in the field. The general location of these communities in relation to the project elements is depicted in Figure 5.5-1. The following is a description of each of the vegetative communities occurring within the project site:

> ***California Annual Grassland Series (AG).*** This community is composed of low-growing native and non-native annual grasses and forbs in areas generally used for grazing, but may be fallow or inactive. Within the proposed Phase IV project area, the California annual grassland series was observed in close association with the California live oak woodland series and in areas of low relief. Dominant species included several invasive weedy species such as slender wild oats (*Avena barbata*), ripgut grass (*Bromus diandrus*), Italian thistle (*Cardus pycnocephalus*), red-stem filaree (*Erodium cicutarium*), and black mustard (*Brassica nigra*). This community represents the dominant cover of the Signal Lease area within the northern portion of the project area (i.e., active cattle grazing area).

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VEGETATIVE COVER TYPES
FIGURE 5.5-1

Coyote Brush Series (CBS). This community is dominated by coyote brush (*Baccharis pilularis*), a moderate-sized shrub (<2m) with mesophytic leaves and semiwoody stems growing from a woody base. Sub-dominate species included California sagebrush (*Artemisia californica*), black sage (*Salvia mellifera*), sticky monkey flower (*Mimulus aurantiacus*). Arroyo willow (*Salix lasiolepis*) also occurred frequently in association within this community. Coyote brush habitat is present within the project area in scattered locations primarily bordering existing well pads and in close association with the California annual grassland, California live oak woodland series, and Well's manzanita series.

Well's Manzanita Series (WMS). The plant community is represented by areas dominated by Well's manzanita (*Arctostaphylos wellsii)*, a broad-leaved sclerophyllous shrub, <3 meter tall, forming dense, often impenetrable stands. This community is prevalent throughout the upper elevations of the project site on south-facing slopes and in close association with rocky outcrops and shallow soils associated with the Edna member of the Pismo formation (i.e., Edna tar sands deposits). Chamise (*Adenostoma fasciculatum*) also occurs frequently within this community. It should be noted that this community is referred to as central maritime chaparral within the CNDDB, and is considered a sensitive habitat area of limited distribution.

Chamise Series (CS). This plant community is represented by areas dominated by chamise, a sclerophyllous shrub, <3 meter tall with frequent occurrence of manzanita and other chaparral species, including but not limited to mountain mohagany (*Cercocarpus betuloides*) and spiny redberry (*Rhamnus crocea*). The chamise series is prevalent within the eastern portion of the project area within the vicinity of Maino 21J and Maino 21L. This community is also typically found on south-facing slopes containing rocky outcrops and relatively shallow soils.

California Live Oak Woodland Series (CLOWS). California live oak woodland communities are characteristic of the rolling hills and valleys of California's central coast. This habitat is particularly important for its ability to support a wide variety of wildlife species due to its high value as foraging habitat and vegetative cover (e.g., acorn production, forest canopy, etc.). However, because this habitat is frequently lost to agriculture and/or development, oak woodlands have been declining for many years. This situation is aggravated by the long time period required for regeneration of this habitat. As a consequence, oak woodland is recognized by the CDFG as a valuable habitat that should be protected. Further, oak woodland is considered to be a sensitive resource by San Luis Obispo County. California live oak woodland is considered a climax plant community, which often forms dense, closed-canopies in mesic sites. Within the project site, this community is dominated by coast live oak primarily occurring in dense stands on north-facing slopes. Typical understory species occurring within this community included toyon (*Heteromeles arbutifolia*), California coffee-berry (*Rhamnus californica*), poison oak (*Toxicodendron diversilobum*), and California blackberry (*Rubus ursinus*). As indicated above, this community is prevalent in undisturbed sites throughout the project area.

Riparian Woodland (RW). This community is dominated by shrub-sized (<20 feet high) willows, and occurs along the banks of Pismo Creek and associated drainages. Scattered stands of riparian trees, principally western sycamore (*Platanus racemosa*) and black cottonwood (*Populus balsamifera*) are also present along the stream channel and surrounding areas. Additionally, coast live oaks are present in some portions of the riparian corridor. This community corresponds to the Riparian Shrub-Scrub wetland community described by Cowardin et al. (1979). Pismo Creek is perennial coastal stream that flows into the Pacific Ocean at a point approximately 3 miles south of the project area. It is characteristic of a Central coast steelhead/speckled dace stream (A2635) under the inland waters classification system developed by Moyle and Ellison (1991). Species abundance can be high, diversity low and structural heterogeneity moderate to high, particularly in areas with tree, shrubs, and herbaceous layers.

Ruderal (RU). It should be noted that the species composition of plant communities within existing well sites is highly variable due to the frequency and magnitude of past disturbance. Specifically, the majority of the well sites are located adjacent to and/or within roadways and have been heavily influenced by ongoing oil field activities, which have resulted in the replacement of native plant communities with facility equipment, piping, and non-native plant species. This term is used to describe those areas that have been disturbed by past land-use practices and/or recent ground disturbance, and are confined to the weedy areas located within existing well pads and bordering access roadways. Typical species are ruderal (disturbance-adapted) plants such as poison hemlock (*Conium maculatum*), cheeseweed (*Malva parviflora*), prickly wild sowthistle (*Sonchus asper*), prickly lettuce (*Lactuca serriola*), white sweetclover (*Melilotus alba*), telegraph weed (*Heterotheca grandiflora*), and summer mustard (*Hirschfeldia incana*).

Wildlife. Wildlife surveys were conducted at the project site in April and May of 2003. Detection methods included direct observation with binocular, examination and identification of tracks, scats, burrows/diggings, and carcasses/skeletal remains; and identification of vocalizations (calls and songs). Surveys were supplemented with previously published wildlife reports, regional and local species distribution references, and consultation with the USFWS and CDFG to determine which species occur or potentially occur on the project site. Appendix E contains a listing of wildlife species observed during field surveys and/or expected to occur within the various vegetative communities. It should be noted that accurate assessment of wildlife populations would require extended periods of site research, trapping, and census taking. It is particularly difficult to detect nocturnal, rare or reclusive species to obtain accurate estimates of population size and geographical distribution. Other complications in the quantitative assessment of vertebrate (and invertebrate) populations include:

1. Many species may occur in the area only for short periods during migrations;
2. Many species of amphibians and reptiles become inactive during one or more seasons; and,
3. Seasonal or annual fluctuations in climate or weather patterns may confound observations.

The principal cover types that would be impacted by proposed project activities are California annual grassland series, Well's manzanita series, California live oak woodland, and coyote brush scrub. Typical wildlife species found in association with each of these cover types are discussed below:

California Annual Grassland Series. The grassland habitat is dominated by low-growing vegetation that provides forage and cover for small mammals, such as voles, deer mice, ground squirrels, and Botta's pocket gopher. These species, in turn, provide the prey base for predators such as red-tailed hawk, red-shouldered hawk, American kestrel, gopher snake, and coyote. Little nesting cover is provided; however, certain species of plants, such as fennel, provide perch sites and forage for birds. Typical bird species include Brewer's blackbird, mourning dove, western kingbird, and western meadowlark. Other species common to this habitat include western fence lizard, house finch, sparrows, wintering raptors, and striped skunk.

Well's Manzanita Series (Central Maritime Chaparral). Numerous rodents inhabit chaparral habitat and deer and other herbivores often make extensive use of this plant community. Throughout the west slope of the Sierra and south through the Transverse Range, deer are strongly associated with chaparral communities. Specifically, chaparral provides critical summer range foraging areas, escape cover and fawning habitat (CDFG, 1988). Some small herbivores use chaparral species as forage in fall and winter when grasses are not in abundance. Rabbits eat twigs, evergreen leaves and bark from chaparral plant species. Shrubs are important to many mammals as shade during hot weather and moderate temperature and wind velocity in the winter season. During the recent field surveys conducted at the site, numerous woodrat (*Neotoma* sp.) nests were observed in close association with the chaparral habitat areas. Other animals common to this habitat include various reptiles such as, side-blotched lizard, sagebrush lizard, western whiptail, common kingsnake, western rattlesnake, and potentially California horned lizard, which is California species of special concern. Further, large predatory mammals such mountain lion, bobcat, and grey fox may also frequent this habitat type in search of prey.

Many birds also find a variety of habitat needs in chaparral, including seeds, fruits, insects, protection form predators and climate, as well as roosting and nesting sites. Typical bird species include California quail, greater roadrunner, Anna's hummingbird, bushtit, Bewick's wren, house wren, wrentit, California thrasher, California towhee, spotted towhee, golden-crowned sparrow, white-crowned sparrow, and lesser goldfinch.

California Live Oak Woodland. As stated above, coastal oak woodlands provide habitat for a variety of wildlife species. However, population numbers may fluctuate dependent upon annual acorn production within a given area. Specifically, common ground-dwelling birds such as quail and turkey, and various mammals including squirrels and deer may be so dependent on acorns in fall and early winter that a poor acorn year can result in significant declines in their populations (CDFG, 1988).

Due to the extensive canopy and sub-canopy existing within mature stands of oak woodland, a wide variety of bird species have the potential to frequent oak canopies to

utilize them as protective cover and for the purposes of nesting. Typical bird species include acorn woodpecker, Nuttall's woodpecker, downy woodpecker, hairy woodpecker, northern flicker, white-breasted nuthatch, brown creeper, ash-throated flycatcher, Pacific-slope flycatcher, oak titmouse, chestnut-backed chickadee, Bewick's wren, and western scrub-jay. These bird species along with various small mammal species that inhabit the forest floor, in turn, provide the prey base for predators such as sharp-shinned hawk, Cooper's hawk, western screech owl, and great-horned owl within oak woodland habitat areas. Numerous woodrat houses were also observed in close association with the oak woodland habitat. Further, mature oak woodlands are an important habitat for the survival of several bat species, including the pallid bat, as they provide downed woody debris for roosting.

***Coyote Brush Series*.** As stated above, this community primarily occurred along borders of existing well pads in close association with grassland, oak woodland, and chaparral habitat areas (i.e., intermingled). Though vegetative productivity is lower in the coyote brush scrub than in adjacent chaparral/woodland habitats, it appears to support numbers of vertebrate species roughly equivalent to those in surrounding areas. As such, those species expected to occur in adjacent habitats would also be expected to frequent the coyote brush series existing within the project area.

A complete listing of the wildlife species observed during field surveys and/or expected to occur within the various vegetative communities is provided as in Appendix E.

Special-Status Plant Species. Special-status plant species are either listed as endangered or threatened under the Federal or California Endangered Special Acts, or rare under the California Native Plant Protection Act, or considered to be rare (but not formally listed) by resource agencies, professional organizations (e.g., Audubon Society, CNPS, The Wildlife Society), and the scientific community. For the purposes of this project, special-status plant species are defined in Table 5.5-2.

Based on data provided by USFWS, coordination with CDFG, a query of the CNDDB, and a review of pertinent literature, a list of potential special-status species occurring in the general vicinity of the project was compiled. The results of the literature search conducted for this impact analysis indicates that 20 special-status plant species have the potential to occur in the project region. Table 5.5-3 lists these species, their current status, habitat requirements, presence of habitat, and the nearest known location relative to the Plains Exploration and Production oil facility.

Table 5.5-2
Definitions of Special-Status Plant Species

Special-Status Plant Species
➢ Plants listed or proposed for listing as threatened or endangered under the Federal Endangered Species Act (50 CFR 17.12 for listed plants and various notices in the Federal Register for proposed species).
➢ Plants that are candidates for possible future listing as threatened or endangered under the Federal Endangered Species Act (Federal Register Vol. 67, No. 114, pp. 40657-4067, June 13, 2002).
➢ Plants that meet the definitions of rare or endangered species under the CEQA (*State CEQA Guidelines,* Section 15380).
➢ Plants considered by the CNPS to be "rare, threatened, or endangered" in California (Lists 1B and 2 in California Native Plant Society, 2001).
➢ Plants listed by CNPS as plants about which we need more information and plants of limited distribution (Lists 3 and 4 in California Native Plant Society, 2001).
➢ Plants listed or proposed for listing by the State of California as threatened or endangered under the California Endangered Species Act (14 CCR 670.5).
➢ Plants listed under the California Native Plant Protection Act (California Fish and Game Code 1900 et seq.).
➢ Plants considered sensitive by other Federal agencies (i.e., U.S. Forest Service, Bureau of Land Management), state and local agencies or jurisdictions.
➢ Plants considered sensitive or unique by the scientific community or occurring at the limits of its natural range (*State CEQA Guidelines*, Appendix G).

Table 5.5-3
Special-Status Plant Species Potentially Occurring in the Project Area

Common Name ***Scientific Name***	**Status**	**Habitat**	**Habitat Present/ Absent**	**Nearest Known Location**
Beach spectaclepod *Dithyrea maritima*	FSC / ST / List 1B	Coastal dunes, coastal scrub	A	Pismo State Beach, 1.5 miles south of Pismo Beach, 3 miles west of Arroyo Grande (CNDDB, 2003).
Black-flowered figwort * *Scrophularia atrata*	FSC / -- / List 1B	Closed-cone coniferous forest, chaparral, coastal dunes, coastal scrub, riparian scrub	P	Species observed on-site during 2003 botanical surveys.
Blochman's dudleya *Dudleya blochmaniae* ssp. *blochmaniae*	-- / -- / List 1B	Coastal scrub, coastal bluff scrub, valley and foothill grassland	P	Froom Ranch, west of intersection of Los Osos Valley Road and U.S. 101, just outside city limits of San Luis Obispo (CNDDB, 2003).
Brewer's spineflower *Chorizanthe breweri*	-- / -- / List 1B	Chaparral, cismontane woodland, coastal scrub, closed-cone coniferous forest	P	Price Canyon Road about 1 mile southwest of Highway 227, south of San Luis Obispo (CNDDB, 2003)
Chorro creek bog thistle *Cirsium fontinale* var. *obispoense*	FE/ SE / List 1B	Chaparral, cismontane woodland, and serpentine seeps	P	Froom Ranch, west of Los Osos Valley Road, South of San Luis Obispo (CNDDB, 2003)

Common Name *Scientific Name*	Status	Habitat	Habitat Present/ Absent	Nearest Known Location
Congdon's tarplant *Centromadia parryi* ssp. *congdonii*	FSC / -- / List 1B	Valley and foothill grassland	P	Laguna Lake, near San Luis Obispo (CNDDB, 2003)
Fuzzy prickly phlox* *Leptodactylon californicum* ssp. *tomentosum*	-- / -- / List 4	Chaparral, coastal dunes and scrub	P	Species observed during botanical surveys conducted on-site (Levine Fricke, 2002)
Gambel's watercress *Rorippa gambellii*	FE / ST / List 1B	Freshwater and brackish marshes	A	Black Canyon, Oceano (CNDDB, 2003).
Hoover's bent grass * *Agrostis hooveri*	-- / -- / List 1B	Chaparral and grassland	P	Species observed during botanical surveys conducted on-site (Levine Fricke, 2002)
Indian knob mountainbalm *Eriodictyon altissimum*	FE / SE / List 1B	Chaparral, cismontane woodland	P	Indian knob, about 4 miles north of Pismo and 3 miles south of San Luis Obispo (CNDDB, 2003).
Jones's layia *Layia jonesii*	FSC / -- / List 1B	Chaparral, valley foothill grassland	P	1.75 mile southwest of San Luis Obispo (CNDDB, 2003)
La Graciosa thistle *Cirsium loncholepis*	FE / ST / List 1B	Coastal dunes, brackish marshes and riparian scrub	A	Callendar dunes, south of Oceano (CNDDB, 2003).
Leafy tarplant *Deinandra increscens* ssp. *foliosa*	-- / -- / List 1B	Valley and foothill grassland	P	Immediately NE of Lopez Reservoir (CNDDB, 2003)
Marsh sandwort *Arenaria paludicola*	FE / SE / List 1B	Marshes and swamps	A	Pismo Beach, San Luis Obispo County (CNDDB, 2003)
Morro manzanita *Arctostaphylos morroensis*	FT / -- / List 1B	Chaparral, cismontane woodland, coastal dunes, coastal scrub	P	Edge of Prefumo Canyon Road in Prefumo Canyon, Southwest of San Luis Obispo (CNDDB, 2003)
Nipomo Mesa lupine *Lupinus nipomensis*	FE / SE / List 1B	Coastal dunes	A	Oceano dunes (CNDDB, 2003)
Obispo Indian paintbrush *Castilleja densiflora* ssp. *obispoensis*	-- / -- / List 1B	Valley and foothill grassland	P	See Canyon, San Luis Obispo (CNDDB, 2003)
Pecho manzanita *Arctostaphylos pechoensis*	FSC / -- / List 1B	Closed cone coniferous forest, chaparral, and coastal scrub	P	Davis Canyon, Irish Hills (CNDDB, 2003)
Pismo clarkia * *Clarkia speciosa* ssp. *immaculata*	FE / SR / List 1B	Chaparral, cismontane woodland, valley and foothill grassland	P	Species observed on-site during 2003 botanical surveys.
Saint's Daisy* *Erigeron sanctarum*	-- / -- / List 4	Chaparral, cismontane woodland and coastal scrub	P	Species observed during botanical surveys conducted on-site (Levine Fricke, 2002)
San Luis mariposa lily *Calochortus obispoensis*	-- / -- / List 1B	Chaparral, coastal scrub, valley and foothill grassland	P	Western ridge of Indian Knob, about 4 miles north of Pismo Beach (CNDDB, 2003)

Common Name *Scientific Name*	Status	Habitat	Habitat Present/ Absent	Nearest Known Location
San Luis Obispo County lupine *Lupinus ludovicianus*	FSC / -- / List 1B	Chaparral, cismontane woodland	P	Hills north of Price Canyon, north of Pismo Creek, NNE of Pismo Beach (CNDDB, 2003).
Santa Lucia manzanita *Arctostaphylos luciana*	FSC / -- / List 1B	Chaparral	P	1.75 miles NNE of Slide Hill, East of San Luis Obispo (CNDDB, 2003)
Santa Margarita manzanita *Arctostaphylos pilosula*	FSC / -- / List 1B	Closed-cone coniferous forest, and chaparral.	P	Vicinity of Indian Knob, about 3.5 miles NNW of Pismo Beach, South of San Luis Obispo (CNDDB, 2003)
Surf thistle *Cirsium rhothophilum*	FSC / ST / List 1B	Coastal dunes, costal bluff scrub	A	Pismo Beach (CNDDB, 2003)
Well's manzanita * *Arctostaphylos wellsii*	-- / -- / List 1B	Chaparral, closed-cone coniferous forest	P	Species observed during botanical surveys conducted on site (Padre, 2003)

Status Codes:

FE	Federal Endangered (U.S. Fish and Wildlife Service [USFWS])
FT	Federal Threatened (USFWS)
List 1B	Plants rare, threatened, or endangered in California and elsewhere (CNPS)
List 4	"Watch list" for plants of limited distribution (CNPS)
SE	State Endangered (CDFG)
ST	State Threatened (CDFG)
SR	State Rare (CDFG)
*	Species observed during recent surveys (Padre 2003, Levine Fricke 2002)

To determine the presence and/or absence of the special-status plant species listed in Table 5.5-3 above, a focused botanical survey of the project site was conducted in May 1 and 8, 2003, during the typical flowering period for the majority of the species listed. In addition, supplemental biological surveys were conducted in August and September 2003 and resulted in the identification of several other "late-blooming" species. For a complete listing of vascular flora observed within the project site, please refer to Appendix E.

Special-status plant species that could potentially occur within the project site based on known occurrences within the vicinity of Price Canyon or adjacent portions of San Luis Obispo County included Blochman's dudleya, Brewer's spineflower, Jones' layia, Obispo Indian paintbrush, San Luis mariposa lily, Chorro creek bog thistle, Congdon's tarplant, and leafy tarplant. However, none of these species were observed during the 2003 botanical surveys conducted within the project area or during past botanical surveys conducted by Levine Fricke in 2000, 2002 and SAIC in 1994.

In addition, Well's manzanita was the only species of *Arctostaphylos* identified in the project area and represents the dominant component of the Central maritime chaparral habitat occurring within the site. Therefore, Morro manzanita, Santa Margarita manzanita, Pecho manzanita, and Santa Lucia manzanita are not expected to occur within the project site. Moreover, special-status plant species associated with specific habitats types such as surf thistle, beach spectaclepod, La Graciosa thistle, Nipomo Mesa lupine, Gambel's watercress, and marsh sandwort were not observed during surveys and are not expected to occur within the site due to the lack of suitable habitat (i.e., require coastal foredune and marsh habitat, which is not present within the project site).

Three special-status plant species were observed on the project site during the 2003 botanical surveys including black-flowered figwort, Pismo clarkia, and Well's manzanita. Additionally, Hoover's bent grass and Saint's daisy were previously identified and mapped within the project site by Levine Fricke (2002). The locations of these plant species are illustrated on the following Figure 5.5-2. It should be noted that the location of the Well's manzanita has not been identified on Figure 5.5-2 because of its dominance in the Central maritime chaparral habitat.

In addition, fuzzy prickly phlox was identified within the site by Levine Fricke (2002); however, outside the proposed impact areas of the project. Further, the manzanita-dominated chaparral occurring throughout the western portion of the site is potentially suitable habitat for Indian Knob mountainbalm, which is known to occur just northwest of the site. San Luis Obispo County lupine would also be expected on thin, sandy soils of the chaparral and is known to occur approximately one mile north of Price Canyon (Levine Fricke, 2002). However, none of these three sensitive plant species were observed during the 2003 botanical field survey.

For the purposes of impact analysis, the following briefly presents the legal status and applicable ecological and range information for those special-status plant species identified within the proposed impact areas and for those that have a high likelihood of occurrence:

Pismo Clarkia (*Clarkia speciosa spp. immaculata*). The Pismo clarkia is an annual herb that typically blooms from May to June, and is only known from four extant occurrences (CNPS, 2001). It is Federally listed as endangered, California listed as rare, and is on the CNPS List 1B for plants rare, threatened or endangered in California and elsewhere. Pismo clarkia typically occurs within chaparral, cismontane, and grasslands and is generally closely associated with oak woodland habitat. Many occurrences of Pismo clarkia were noted within the project site, most commonly within areas of annual grassland located along the perimeter of oak trees, road cuts, and well pads (see Figure 5.5-2).

Black-flowered figwort (*Scrophularia atrata*). Black-flowered figwort is a Federal species of concern and is a CNPS list 1B species. This species typically occurs in chaparral, coastal dunes, and riparian scrub habitat and is most commonly associated with rock outcroppings. Black-flowered figwort is a tall, perennial herb that blooms from April through June. Suitable habitat to support this species exists in several locations within the project area (see Figure 5.5-2).

Well's manzanita (*Arctostaphylos wellsii*). Well's manzanita is a CNPS list 1B species and is endemic to San Luis Obispo County. This chaparral shrub species blooms from December to April and occurs primarily on the Pismo sandstone formation in southern San Luis Obispo County (SAIC, 1994). As stated above, this species represents the dominant shrub within the maritime chaparral habitat of the project area. This species had formerly been referred to as Edna manzanita (*Arctostaphylos pilosula* ssp. *pismoensis*) in the final Supplemental EIR prepared by SAIC (1994).

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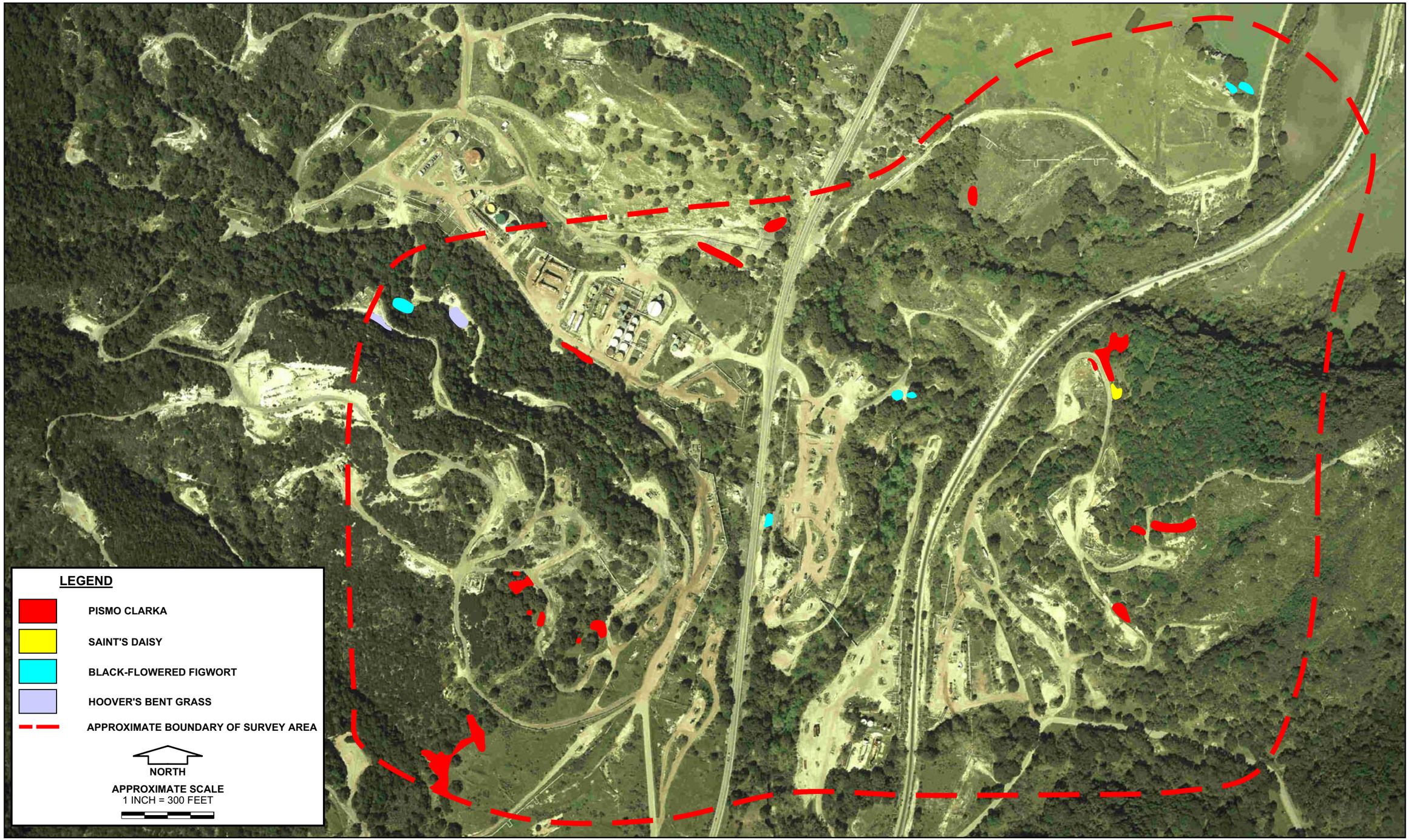

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DISTRIBUTION OF SPECIAL-STATUS PLANT SPECIES
FIGURE 5.5-2

Hoover's bent grass (*Agrostis hooveri*). Hoover's bent grass is a CNPS List 1B species. This species occurs in chaparral, cismontane woodland, valley foothill grassland communities with sandy substrate. Hoover's bent grass is a tufted perennial that typically flowers during the month of June (Skinner and Pavlik, 1994). Hoover's bent grass was identified by Levine Fricke (2002) on road cuts on the western portion of the site, on thin soil at the margins of oak canopies (see Figure 5.5-2).

Saint's daisy (*Erigeron sanctarum*). Saint's daisy is a CNPS List 4 species. This species is a small herbaceous perennial in the sunflower family (Asteraceae), which occurs in chaparral, cismontane woodland and coastal scrub communities at elevations below 300 meters. The blooming period for this species is typically from March to July. Saint's daisy was identified by Levine Fricke (2002) adjacent to a road cut within the eastern portion of the site (see Figure 5.5-2).

Fuzzy prickly phlox (*Leptodactylon californicum* ssp*. tomentosum*). Fuzzy prickly phlox is a CNPS List 4 species. This species is a small herbaceous perennial in the phlox family (Polemoniaceae), which typically occurs in openings within chaparral habitat on dry hillsides at elevations up to 1500 meters. The blooming period for this species is typically from February to May. Fuzzy prickly phlox was identified outside the proposed impact areas by Levine Fricke (2002).

Indian Knob mountainbalm (*Eriodictyon altissimum*). Indian knob mountain balm is a Federal and State endangered plant species, and a CNPS List 1B species. This species is a woody shrub in the waterleaf family (Hydrophyllaceae), which typically occurs along sandstone ridges and chaparral habitat in southwest San Luis Obispo County at elevations at approximately 250 meters. The blooming period for this species is typically from March to June and it has the potential to occur within chaparral habitat areas of the site.

San Luis Obispo County lupine (*Lupinus ludovicianus*). San Luis Obispo County lupine is a Federal species of concern and a CNPS List 1B species. This species is a small herbaceous perennial endemic to San Luis Obispo County and in the pea family (Fabaceae). It typically occurs in open grasslands and oak woodland habitat up to 500 meters. The blooming period for this species is typically from April to June and it has the potential to occur the within adjacent oak woodland habitat areas of the site.

Special Status Wildlife Species. For the purposes of this project, special-status wildlife species are defined in Table 5.5-4. Literature research and field surveys conducted for this impact analysis indicates that 22 special-status wildlife species have the potential to occur in the vicinity of project components. Information regarding regulatory status and known location of these species relative to project components is provided in Table 5.5-5. Additional discussion of special-status wildlife species is provided below.

Table 5.5-4
Definitions of Special-Status Wildlife Species

Special-Status Animal Species
➢ Animals listed or proposed for listing as threatened or endangered under the Federal Endangered Species Act (50 CFR 17.11 for listed animals and various notices in the Federal Register for proposed species).
➢ Animals that are candidates for possible future listing as threatened or endangered under the Federal Endangered Species Act (Federal Register Vol. 67, No. 114, pp. 40657-4067, June 13, 2002).
➢ Animals that meet the definitions of rare or endangered species under the CEQA (*State CEQA Guidelines*, Section 15380).
➢ Animals listed or proposed for listing by the State of California as threatened and endangered under the California Endangered Species Act (14 CCR 670.5).
➢ Animal species of special concern to the CDFG (Remsen, 1978 for birds; Williams, 1986 for mammals).
➢ Animal species that are fully protected in California (California Fish and Game Code, Section 3511 [birds], 4700 [mammals], and 5050 [reptiles and amphibians]).

Table 5.5-5
Special-Status Wildlife Species Potentially Occurring within the Project Area

Common Name ***Scientific Name***	**Status**	**Nearest Known Occurrence(s)**
	Invertebrates	
Morro shoulderband snail *Helminthoglypta walkeriana*	FE	Between Calle Joaquin Road and Highway 101, San Luis Obispo (CNDDB, 2003)
Monarch butterfly *Danaus plexippus*	SA	Pismo Dunes State Vehicular Recreation Area District Office, Grover Beach (CNDDB, 2003)
	Fish	
South-central California coast steelhead *Oncorhynchus mykiss irideus*	FT, CSC	Pismo Creek and West Corral de Piedra Creek, Price Canyon (CNDDB, 2003)
Tidewater goby *Eucyclogobius newberryi*	FE, CSC	Pismo Creek (from mouth to 1.0 mile upstream), Pismo Beach (CNDDB, 2003)
	Reptiles	
California horned lizard *Phrynosoma coronatum frontale*	FSC, CSC	El Chorro Regional Park, San Luis Obispo County (CNDDB, 2003); Guadalupe Dunes, San Luis Obispo County (Unocal, 2000)
Southwestern pond turtle *Clemmys marmorata pallida*	FSC, CSC	Pismo Creek (Morro Group, 2001)
Two striped garter snake *Thamnophis hammondi*	CSC	Cuyama River, Los Padres National Forest (CNDDB, 2003)
	Amphibians	
California tiger salamander *Ambystoma californiense*	FC, CSC	Biddle Regional County Park, Lopez Canyon, southeast of San Luis Obispo (CNDDB, 2003)
California red-legged frog *Rana aurora draytonii*	FT, CSC	Corbett Canyon Creek, Arroyo Grande (CNDDB, 2003)
	Birds	
Western snowy plover C*haradrius alexandrinus nivosus*	FT (nesting), CSC (nesting), M	Pismo State Beach (CNDDB, 2003)
California least tern *Sterna antillarum browni*	FE (nesting colony), SE (nesting colony), M	Pismo State Beach (Padre, 2003)

Common Name *Scientific Name*	Status	Nearest Known Occurrence(s)
Brown pelican *Pelecanus occidentalis*	FE (nesting colony), SE (nesting colony), M	Pismo State Beach (Padre, 2003)
Western yellow-billed cuckoo *Coccyzus americanus occidentalis*	SE (nesting) FC (nesting), M	San Luis Obispo. Last documented occurrence was 1921. (CNDDB, 2003)
Cooper's hawk * *Accipiter cooperii*	CSC (nesting), M	Observed during 2003 surveys conducted on-site.
American peregrine falcon * *Falco peregrinus anatum*	FSC (nesting), SE (nesting), FP, M	Observed during 2003 surveys conducted on-site.
Loggerhead shrike *Lanius ludovicianus*	FSC (nesting), CSC (nesting), M	Observed on site during previous survey (ERCO, 1981)
Northern harrier *Circus cyaneus*	CSC (wintering), M	Known from region; nearest occurrence unknown
Sharp-shinned hawk *Accipiter striatus*	CSC (nesting), M	Known from region; nearest occurrence unknown
Southwestern willow flycatcher *Empidonax trailli extimus*	SE (nesting), M	Known from region; nearest occurrence unknown
Yellow warbler *Dendroica petechia*	CSC (nesting), M	Recorded at Pismo Beach and Oceano (SAIC, 1994)
Mammals		
San Diego desert woodrat *Neotoma lepida intermedia*	CSC	Green Peak, approximately 1.5 miles southeast of Diablo Canyon (CNDDB, 2003)
Southern sea otter *Enhydra lutris nereis*	FT, FP	Pismo State Beach (Padre, 2003)

Status Codes:

FE	Federal Endangered (USFWS)
FT	Federal Threatened (USFWS)
FSC	Federal Species of Special Concern (USFWS)
FC	Federal Candidate Species (USFWS)
SE	State Endangered (CDFG)
ST	State Threatened (CDFG)
CSC	California Species of Special Concern (CDFG)
FP	Fully Protected under California Fish and Game Code
SA	Special animal (CDFG)
M	Protected under the Migratory Bird Treaty Act of 1918
*	Species observed during recent surveys (Padre 2003)

For the purposes of impact analysis, the following briefly presents the legal status and applicable ecological and range information for those special-status wildlife species identified within the proposed impact areas and/or for those that have a high likelihood of occurrence based on the presence of suitable habitat. Special-status wildlife species associated with coastal and/or marine habitats located west of the project area such as the southern sea otter, least tern, western snowy plover, and brown pelican were not observed during surveys and are not expected to occur within the site due to the lack of suitable habitat.

Invertebrates

Morro shoulderband snail (*Helminthoglypta walkeriana*). The Morro shoulderband snail is a Federally endangered species. This species inhabits the accumulated litter and undersides of low shrub branches that exhibit dense, low growth and ample contact to the ground, particularly mock heather (*Ericameria ericoides*), seaside golden yarrow (*Eriophyllum staechadifolium*), deerweed (*Lotus scoparius*), and dune almond (*Prunus fasciculata* var. *punctata*) (USFWS, 2003). Based on this observation, favorable

microclimate for the species may depend on shrubs that provide partial shading and act as windbreaks to moderate temperatures and moisture loss within accumulated plant litter. Recent records from the Chorro Valley and City of San Luis Obispo suggest the snails can find adequate shelter and moisture under woody debris and in decaying vegetation under fennel (*Foeniculum vulgare*) and other shrubs. During the field surveys of the project site, no Morro shoulderband snails or suitable habitat was identified. Furthermore, based on the known range of the Morro shoulderband snail this species is not expected to occur within the project area.

Monarch butterfly *(Danaus plexippus)*. The overwintering habitats for the monarch butterfly are considered to be of special concern by CDFG. This species is known to roost in winter (usually in dense concentrations) within groves of eucalyptus or pine trees. Autumnal roosts are abandoned early (November or December) by individuals seeking more favorable conditions, while permanent roosts begin forming in October and persist into February. There are several known eucalyptus woodland monarch butterfly roosting areas located within coastal San Luis Obispo County. The nearest known overwintering location to the project area is in Pismo Beach. Several groves of eucalyptus occur within the site however no monarch congregations were observed during the numerous field surveys conducted by Padre and Levine Fricke.

Fish

South-central California coast steelhead (*Oncorhynchus mykiss irideus*). South-central California coast steelhead is a Federally threatened species and a California species of concern. Steelhead are an anadromous form of rainbow trout that reproduce in freshwater, but spend much of their life cycle in the ocean, where increased prey density provides a greater growth rate and size. Steelhead have been divided into 15 evolutionary significant units (ESU) based on similarity in life history, location, and genetic markers. The south-central California coast ESU includes all naturally spawned populations of steelhead (and their progeny) in streams from the Pajaro River (inclusive) to, but not including the Santa Maria River, California (NMFS, 2003). The south-central California coast ESU was listed as threatened by the National Marine Fisheries Service (NMFS) on August 18, 1997.

South-central California coast steelhead are distributed throughout the Pismo Creek watershed (Morro Group, 2001). Although no direct impacts to steelhead are expected with project implementation, indirect impacts to Pismo Creek could occur during construction (i.e., erosion and sediment run-off during rainy season) or in the event of an uncontained oil spill within the facility.

Tidewater goby (*Eucyclogobius newberryi*). Tidewater goby is a Federally listed endangered fish and California species of special concern that inhabits brackish water habitats along the California coast. This native species is found along the Pacific coast of California from Humboldt County to San Diego County (Moyle, 1976). It is a small fish rarely exceeding 5.1 cm (2.0 in) in length, and all life stages occur in the upper end of lagoons with salinities ranging from 5 to 20 parts per thousand (ppt). As such, tidewater gobies inhabit water ranging from completely fresh to brackish and have been recorded up to 5 miles upstream in ponded freshwater (SAIC, 1994).

This species is documented in Pismo Creek near and downstream of the Pismo Beach Wastewater Treatment Plant (Morro Group, 2001). Although no direct impacts to tidewater goby are expected with project implementation, indirect impacts to Pismo Creek could occur during construction (i.e., erosion and sediment run-off during rainy season) or in the event of an uncontained oil spill within the facility.

Reptiles

California horned lizard (*Phrynosoma coronatum frontale*). The California horned lizard is a Federal species of concern and a California species of special concern that occurs in a variety of open habitats that provide sites for basking, sandy or sandy-loam substrates in which night-time burial can occur, and a suitable prey base (the species feeds almost exclusively on native ants). It was historically distributed throughout the Central and Coast Range, but now occurs at scattered, disjunct locations within this range. The California coast horned lizard produces clutches of 6 to 21 eggs from May to June and hatching typically occurs in August and September. The chaparral habitat areas of the project site may provide suitable habitat for this species, thus vegetation clearing activities during construction of well pads have the potential to result in direct impacts to this species.

Southwestern pond turtle (*Clemmys marmorata pallida*). The southwestern pond turtle is a Federal species of concern and a California species of special concern. It is an aquatic turtle inhabiting streams, marshes, ponds, and irrigation ditches within woodland, grassland, and open forest communities. However, it requires upland sites for nesting and over-wintering. Stream habitat must contain large, deep pool areas (six feet) with moderate-to-good plant and debris cover, and rock and cobble substrates for escape retreats. The southwestern pond turtle is known to occur within the Pismo Creek watershed (Morro Group, 2001). No direct impacts to this species are anticipated with project implementation, however indirect impacts to Pismo Creek could occur during construction (i.e., erosion and sediment run-off during rainy season) or in the event of an uncontained oil spill within the facility.

Two-striped garter snake (*Thamnophis hammondi*). The two-striped garter snake is a California species of special concern which is highly aquatic and is typically found near permanent fresh water streams associated with willow habitat. Small mammal burrows are used as over-wintering sites for the snake (Jennings, 1994). This species occurs historically and currently throughout southern California streams, including the central coast. Existing habitat throughout the Pismo Creek watershed is suitable for this species to occur. Due to the mobility of this species and tendency to inhabit upper banks of riparian corridors, direct impacts to this species may occur during vegetation clearing within the vicinity of Pismo Creek or nearby habitats. Further, indirect impacts through sedimentation of Pismo Creek could occur during construction (i.e., erosion and sediment run-off during rainy season) or in the event of an uncontained oil spill within the facility.

Amphibians

California red-legged frog (*Rana aurora draytonii*) is a Federally listed threatened species and a California species of special concern. It formerly ranged from northern

California south along the Pacific Coast, west of the Cascade Mountains and the Sierra Nevada, to northern Baja California at elevations from near sea level to 8,000 feet. Populations remain in the San Francisco Bay Area, along the California coast, and the western edge of the Central Valley.

The California red-legged frog occurs in different habitats depending on their life stage and season. All stages are most likely to be encountered in and around breeding sites, which include coast lagoons, marshes, springs, permanent and semi-permanent natural ponds, ponded and backwater portions of streams, as well as artificial impoundments such as stock ponds, irrigation ponds, and siltation ponds. They require dense and extensive vegetative cover of emergent and bank vegetation including willow (*Salix* sp.), cattail (*Typha* sp.), and bulrush (*Scirpus* sp.). The absence of these species site does not rule-out the possibility that the site provides red-legged frog habitat, but the presence of one or all of these plants is an important indicator that the site may provide foraging or breeding habitat (USFWS, 1997). The largest California red-legged frog densities are associated with deep-water pools with dense stands of overhanging willows and an intermixed fringe of cattails (Jennings and Hayes, 1994).

California red-legged frogs breed from November through March. The female lays between 2,000 to 5,000 eggs in clusters attached to emergent and submergent vegetation in ponds and backwater pools in creeks. The tadpoles remain in this habitat until they metamorphose in the summer between 11 and 20 weeks after hatching. Young frogs can occur in slow moving, shallow riffle zones in creeks or along the margins of ponds.

Although not reported in within the vicinity of the project site, the California red-legged frog is known to occur throughout the drainages of nearby Arroyo Grande, and suitable habitat exists within those portions of Pismo Creek bordering the project site. Thus, direct impacts to this species may occur during vegetation clearing within the vicinity of Pismo Creek or nearby habitats. Further, indirect impacts to Pismo Creek could occur during construction (i.e., erosion and sediment run-off during rainy season) or in the event of an uncontained oil spill within the facility.

Birds

Cooper's hawk (*Accipiter cooperii*). Cooper's hawk is considered a California species of special concern during nesting periods, primarily due to the loss of riparian nesting habitat. Preferred nesting habitat consist of dense stands of coast live oak, riparian or other forest habitat located near water. This species is an uncommon permanent resident and fairly common fall transient along the coast. Cooper's hawk was identified within the oak woodland habitat area during the field surveys conducted within the project area.

American peregrine falcon (*Falco peregrinus anatum*). American peregrine falcon is considered a State endangered species and a Federal species of concern during nesting periods. Peregrine falcons nest on rugged cliffs and human-made structures in the interior and along the coast of California, and it is an uncommon migrant and breeder in the state. Peregrine falcons may forage for medium-sized birds in almost any habitat except for dense forest. Although the peregrine falcon may rarely fly over the area, potential nesting

habitat exists on nearby cliffs within the project area, and one was observed foraging during field surveys of the site.

Loggerhead shrike (*Lanius ludovicianus*). Loggerhead shrike is considered a Federal species of concern and a California species of special concern, during nesting periods. The species generally occurs in a variety of open grassland, oak savannah, shrub-land, and other similar habitats where it feeds primarily on large insects (e.g., grasshoppers). However, the species may also occasionally take small reptiles, birds, and mammals. Loggerhead shrikes nest during March to June with young becoming independent during July or August. The nest is generally well-concealed on a stable branch in a densely-foliaged shrub or tree. This species was identified on-site during previous surveys (SAIC, 1994).

Northern harrier (*Circus cyaneus*). Northern harrier is a California species of special concern during nesting periods. Nesting sites are typically located within a mound of dead reeds and grass within a marsh or shrubby meadow. Northern harrier typically forages in grassland or wetland habitats where it feeds on mice, rats and frogs. The northern harrier is a fairly common winter visitor and occasional breeder within the coastal region (i.e., breeds within Vandenberg AFB), often foraging in open marshes and fields (SAIC, 1994). This species may occasionally utilize the site for the purposes of foraging and as such may be impacted by project implementation.

Sharp-shinned hawk (*Accipiter striatus*). The sharp-shinned hawk is a California species of concern during nesting periods. This species typically builds nests within woodland habitat where they forage on small birds. Sharp-shinned hawks will also occasionally eat small mammals and insects. This species is a fairly common winter visitor and resident along coastal ridges foraging in woodland and semi-open habitats (SAIC, 1994). This species has the potential to occur within the project area during its winter migration.

Southwestern willow flycatcher (*Empidonax trailli extimus*). The southwestern willow flycatcher is a State and Federally listed endangered species during nesting periods. Dense thickets of riparian vegetation provide nesting and foraging habitat for this species. This vegetation typically includes plant species such as willows (*Salix* sp.) and/or seepwillow (*Baccharis* sp.). Southwestern willow flycatcher is an occasional spring and fall transient along riparian woodland in coastal regions. There are no nesting records of this species within the Pismo Creek drainage, though the creek corridor could provide migratory habitat (resting/feeding).

Yellow warbler (*Dendroica petechia brewsteri*). The yellow warbler is a California species of special concern during nesting periods. Within San Luis Obispo County, this species is a fairly common summer transient of deciduous riparian habitats. This species typically nests within riparian woodland habitat of the coastal foothills from mid-April to early August. Yellow warbler forages within riparian woodland habitats by gleaning the bark of riparian vegetation for insects; however, the species will occasionally eat berries. While habitat within the project area is considered suitable, records of nesting yellow warblers are not known from the project vicinity (Morro Group, 2001).

Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*). The western yellow-billed cuckoo is a Federal candidate for listing as endangered or threatened and a California species of concern. Furthermore, western yellow-billed cuckoo is considered to be a rare species in San Luis Obispo. This species occurs in open woods, orchards, and streamside willow and alder groves. Suitable habitat is present within the project area (Pismo Creek), however, the last known occurrence of the species within the area was in 1921 (CNDDB, 2003).

Mammals

San Diego desert woodrat (*Neotoma lepida intermedia).* San Diego desert woodrat is a California species of special concern. This species typically constructs a nest structure with twigs, sticks, cactus parts, and various other materials. San Diego desert woodrat houses are generally built against rock outcrops or at the base of cactus (Whitaker, 1998). Nests are used for nesting, food caching, and predator escape. Numerous woodrat nests were observed throughout the oak woodland and chaparral habitats of the project site during field surveys. The project site is located near the extreme northern boundary of the desert woodrat's range, it is normally found in more arid habitats commonly associated with cactus scrub and rocky outcrops. Observed woodrat nests were constructed at the base of oak trees and various shrubs including Well's manzanitas and were characteristic of the dusky-footed woodrat, which is a common species throughout San Luis Obispo County. Therefore, San Diego desert woodrat is unlikely to occur at the project site.

Regulated Habitats. According to the Significant Natural Areas of California (Hoshevsky, 1999), the project site occurs within the 55,165-acre Significant Natural Area (SNA) SLO No. 54 within the Pismo Beach, Arroyo Grande NE, Guadalupe, Nipomo, Oceano, Pismo Beach, Point Sal, and Tar Spring Ridge quadrangles. The SNA contains lands managed by the CDFG, Calif. Dept. of Parks and Recreation, the Nature Conservancy, Air Force, County and City Regional Parks and Reserves, State Lands Commission, and privately owned lands. The SNA contains thirty special-status plant and animal species, and five sensitive plant communities as discussed below in further detail.

The CNDDB has inventoried natural communities and ranked them according to their rarity and potential for loss. Based on a CNDDB query for the project area, central foredune, central maritime chaparral, and coastal and valley freshwater marsh are considered sensitive natural communities that have the potential to occur within the project area. However, based on past and recent field surveys, central maritime chaparral is the only sensitive habitat existing within the project area. Specifically, central maritime chaparral has been ranked by the CNDDB globally as G2, and at the State level as S2.2. A global sensitivity level of G2 means only 2,000 to 10,000 acres of this habitat exist worldwide. A State sensitivity of S2.2 means only 2,000 to 10,000 acres of this habitat exist Statewide and is considered very threatened.

As stated above, Pismo Creek and adjacent riparian habitat areas are known steelhead habitat and are considered an integral component of the south central coast steelhead ESU. On April 30, 2002 the U.S. District Court for the District of Columbia approved a NMFS consent decree withdrawing critical habitat designations for 19 salmon and steelhead populations on the west

coast, including those contained in the south central coast steelhead ESU (NOAA, 2003). However, a more thorough analysis of steelhead critical habitat is currently being conducted by NMFS, which will result in the re-issuance of critical habitat designations for the south central coast steelhead ESU.

Wildlife Movement Corridors. Wildlife migration corridors are generally defined as connections between habitat patches that allow for physical and genetic exchange between otherwise isolated animal populations. Migration corridors may be local such as between foraging and nesting or denning areas, or they may be regional in nature. Migration corridors are not unidirectional access routes; however, reference is usually made to source and receiver areas in discussions of wildlife movement networks. "Habitat linkages" are migration corridors that contain contiguous strips of native vegetation between source and receiver areas. Habitat linkages provide cover and forage sufficient for temporary habitation by a variety of ground-dwelling animal species. Wildlife migration corridors are essential to the regional ecology of an area as they provide avenues of genetic exchange and allow animals to access alternative territories as fluctuating dispersal pressures dictate.

Pismo Creek and associated tributaries may play an important role as migration corridors for wildlife species moving within the region and coastal habitat to the west. These migration corridors are especially critical through areas where human activities would otherwise prohibit or impair the movement of species between habitat areas.

5.5.3 Impact Analysis

When development occurs in natural or semi-natural areas, the biological resources of the site and the surrounding area are affected. These effects may take the form of direct impacts, which include habitat loss and fragmentation, introduction of barriers to movement and dispersion, and conversion of native communities to developed conditions. Development may also result in indirect impacts that affect the quality of habitats on and surrounding the project site. These impacts may include the invasion of weedy or landscape plants into natural areas, noise disturbances, and declines in air and water quality. The project sites in and around the Plains Exploration and Production oil facility include areas that have experienced a range of past disturbance from low to high. Consequently, the character of the native communities varies considerably by project element.

5.5.3.1 Standards of Significance

Based on the mandatory findings of significance criteria at Section 15065 and Appendix G of the State CEQA Guidelines (Governor's Office of Planning and Research, 1999), an impact would be significant if any of the following conditions, or potential thereof, would result with implementation of the Proposed Project:

1. 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, the U.S. Fish and Wildlife Service, or the National Marine Fisheries Service;

2. A substantial adverse effect on any riparian habitat or other sensitive natural

community identified in local or regional plans, policies, regulation, or by the California Coastal Commission, California Department of Fish and Game, U.S. Fish and Wildlife Service, or National Marine Fisheries Service;

3. 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;

4. A substantial interference 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 site;

5. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan;

6. A substantial reduction of habitat of a fish and wildlife species;

7. Cause the population of a fish or wildlife population to drop below self-sustaining levels;

8. Threaten to eliminate a plant or animal community; and/or,

9. Conflict with any local polices or ordinances protecting biological resources. For the purpose of this report, relevant goals and policies regarding sensitive resources from the San Luis Obispo County Land Use Ordinance (Title 23), San Luis Bay Inland Planning Area Land Use Element, and Agriculture and Open Space Element were used to assess conflicts with local policies. See Chapter 4.0 for detailed discussion of applicable policies and ordinances.

5.5.3.2 Project Impacts

Short-Term Impacts. The following are the potential impacts of project implementation occurring during the short-term installation phase of the project (i.e., modification of existing well pads and construction of new well pads).

Impact BIO-1: Construction activities could result in the disturbance of wildlife occupying adjacent habitats.

Discussion: Construction will entail the use of heavy equipment and increased human presence throughout the project area. This could potentially disturb wildlife at the construction sites and result in mortality of less mobile species, particularly ground-dwelling (fossorial) species such as California ground squirrel, Botta's pocket gopher, broad-footed mole, and dusky-footed woodrat. More mobile species are likely to be temporarily displaced to alternative habitats until the completion of construction.

Impact Category: Class 3

Thresholds of Significance: 6, 7, and 8.

Mitigation Measure: None required.

Impact BIO-2: Construction activities could adversely affect nesting activities of protected migratory birds.

Discussion: A number of migratory bird species could potentially nest in the California annual grassland, chaparral (Well's manzanita and Chamise series), coyote brush scrub, and California live oak woodland habitat areas of the site. These include ground nesters (northern harrier, horned lark, western meadowlark, and lark sparrow), small tree/shrub nesters (bushtit, American robin, northern mockingbird, house finch, and lesser goldfinch) and several raptors which require large trees for nesting (red-tailed hawk, red-shouldered hawk, etc.). Nest destruction from tree removal and ground-clearing activities could destroy nests, nestlings, or hatchlings, and result in a violation of the Migratory Bird Treaty Act (16 USC 703-712). The Act prohibits, by any means or in any manner, the intentional or unintentional capture, possession, or destruction of any migratory bird, its nest, eggs, young, or parts thereof without a permit issued by the USFWS.

Impact Category: Class 2

Thresholds of Significance: 1 and 4

Mitigation Measure: BIO-2: Construction and drilling operations shall be conducted prior to the initiation of nesting, or after the completion of nesting to avoid any potential impact to migratory birds. Specifically, the following measures should be implemented:

A. Well pad grading operations shall be conducted prior to the initiation of nesting, or after the completion of nesting to avoid any potential impact to migratory birds. Therefore, clearing and grading of well pads, and all drilling operations should be conducted between the months of August and March.

B. If Measure A is infeasible, pre-construction surveys shall be conducted between February 15 and August 15 to identify potential bird and raptor nesting sites:

- If active nest sites of common bird species protected under the Migratory Bird Treaty Act (e.g., northern mockingbird, house finch, etc.) are observed within the vicinity of the project site, then the project shall be modified and/or delayed as necessary to avoid direct take of the identified nests, eggs, and/or young; and,

- If active nest sites of raptors and/or species of special concern (e.g., northern harrier, horned lark, etc.) are observed within the vicinity of the project site, then CDFG shall be contacted to establish the appropriate buffer around the nest site. Construction activities in the buffer zone shall be prohibited until the young have fledged the nest.

Residual Impacts: Implementation of this mitigation measure will reduce potential impacts to less than significant levels.

Impact BIO-3: Construction activities could adversely affect special-status plant and animal species potentially occurring in the project area.

Discussion: The proposed Phase IV drilling program will require the utilization of 31 existing well pads and the construction of four new well pads to accommodate the installation of 95 new production wells and 30 steam injection wells. This will require the modification (i.e., partial grading) of approximately 18 existing well pads and the installation of three steam generators within a previously disturbed area. Existing pads will require from minimal to moderate grading and new pads will be accessible from existing facility roadways; therefore no new roads are proposed as part of the project. Overall, an estimated seven previously undisturbed acres will be disturbed, to varying degrees, by the proposed Phase IV expansion. The construction phase is expected to be completed within a 36-month period ending in 2007.

Special-status species occurring in the project area have the potential to be adversely affected by proposed short-term construction activities throughout the Phase IV expansion area. Specifically, special-status plant species, including Pismo clarkia, black-flowered figwort, Hoover's bent grass, Saint's daisy, and fuzzy prickly phlox have been documented within and/or adjacent to the proposed impact areas (i.e., both new pad and existing pad locations) as illustrated on Figure 5.5-2. The most widely distributed of these species is Pismo clarkia which occurs primarily along slopes, various road cuts, and within grassland areas bordering oak woodlands. Pismo clarkia has been recorded within and/or directly adjacent to the following pads: Rock 4, Signal 10M, Hyla 19H, Maino 19L, and newly proposed Maino16NW.

In addition, Well's manzanita, the primary component of the central maritime chaparral habitat will be impacted by proposed construction activities. Potential impacts to this species were quantified as part of the oak tree survey conducted on-site and summarized in Table 5.5-6 – Well's Manzanita Impact Summary Table. It should be noted that approximately 93% of the total estimated Well's manzanita to be removed would result from construction of new well pad Signal 66C.

Table 5.5-6
Well's Manzanita Impact Summary Table

Well Pad Location	Code	New/ Existing	Disturbed (AC)	# of New Wells	# of Manzanita Removed	# of Manzanita Impacted[1]
Maino 16NW	M16NW	N	0.45	4	1	0
Maino 18L (Maino 19L01, Maino 18SIL, Maino 15	M18L	E	0.09	2	0	2
Maino 21J	M21J	E	0.39	2	0	1
Rock 4	R4	E	0.08	1	0	1
Rock 86	R86	E	0.04	1	0	2
Signal 10M	S10M	E	0.03	1	0	8
Signal 11L	S11L	E	0.3	2	0	6

Well Pad Location	Code	New/ Existing	Disturbed (AC)	# of New Wells	# of Manzanita Removed	# of Manzanita Impacted[1]
Signal 66C	S66C	N	0.52	2	163[2]	0
Signal 101 (Signal 9LI)	S101	E	0.01	1	4	3
Signal 102 (PG 406.5)	S1026	E	0.13	1	5	2
Signal 102 (PG 408.5)	S1028	E	0.18	1	2	7
Signal 105 (Signal 10-5L)	S105	E	0.02	1	0	12
Totals	**--**	**--**	**2.24**	**19**	**175**	**44**

[1] Impacted is defined as any inadvertent damage that may occur to manzanitas located adjacent to well pads during construction including excavated root systems, partially buried plants, broken limbs, and dust impacts.
[2] Density of Well's manzanita located within Signal 66C estimated at 2.5 per 100 sq. ft.

The California horned lizard may be present within and/or adjacent to the well pads during the construction phase of the project. The California horned lizard inhabits the drier and more open areas within the chaparral and scrub vegetation and has a high likelihood of occurrence within the project area. Clearing of chaparral and scrub vegetation and rough grading activities utilizing heavy equipment within existing well pads and within all newly constructed well pads may result in significant impacts to this sensitive species.

Further, special-status bird species such as the loggerhead shrike, horned lark, and sharp-shinned hawk could be potentially impacted during construction through the short-term loss of foraging opportunities within areas of construction. The American peregrine falcon, horned lark, and northern harrier could also be affected during breeding season by the short-term disturbance of the open grassland and adjacent woodland habitat areas. Cooper's hawk is likely to be affected by the short-term disturbance of both foraging habitat and potential nest sites. Historically, the nesting site for the American peregrine falcon within the vicinity of the project area has been at Shell Beach (SAIC, 1994), however the numerous rocky outcrops and cliff faces occurring within the eastern portion of the site may provide suitable nesting sites for falcons. Due to the small area of disturbance and short-term construction period, impacts to foraging raptors are expected to be minimal. However, potential nesting habitat for all bird species should be carefully surveyed prior to construction.

Impact Category: Potential impacts to special-status plant species (Pismo clarkia, black-flowered figwort, Hoover's bent grass, Saint's daisy, fuzzy prickly phlox, and Well's manzanita) and resident special-status animal species (California horned lizard, American peregrine falcon [nesting], horned lark [nesting], northern harrier [nesting], and Cooper's hawk [nesting]) are considered significant and mitigable = Class 2; and impacts to migratory special-status species (loggerhead shrike, and sharp-shinned hawk) that have the potential to periodically frequent the project area for the purpose of foraging are considered short-term and less than significant = Class 3.

Threshold of Significance: 1

Mitigation Measure: BIO-3: The following mitigation measures are recommended to avoid and/or minimize impacts to special-status species known to occur or with the

potential to occur within the existing and newly proposed well pads during construction. This includes protective measures to avoid and/or minimize impacts to Well's Manzanita during the construction phase of the project:

General Measures:

A. All equipment staging areas, construction-crew parking areas, and construction access routes shall be established in previously disturbed or developed;

B. Exclusionary fencing will be erected at the boundaries of ~~all~~ construction areas to avoid equipment and human intrusion into adjacent habitats with emphasis on protection of areas containing special-status species. The exact location of exclusionary fencing for each construction area shall be determined by a County-approved biological monitor. The fencing shall remain in place throughout the construction and drilling phase for each individual pad;

C. A County-approved biological monitor shall conduct a worker orientation for all construction contractors (site supervisors, equipment operators and laborers) which emphasizes the presence of special-status species within the project site, identification, their habitat requirements, and applicable regulatory policies and provisions regarding their protection, and measures being implemented to avoid and/or minimize impacts;

D. During nighttime drilling and/or construction activities, all equipment lighting (i.e., drilling rigs, etc.) shall be shielded away from adjacent wildlife habitat areas and sky to minimize lighting/glare impacts of wildlife; and,

E. Mitigation Measure AQ-1 (a dust control program during the construction phase of the project shall be implemented to minimize dust impacts to adjacent vegetative communities and special-status plant species).

Protective Measures for Special-Status Plants:

F. Due to the fluctuation in annual plant populations, Spring botanical surveys shall be conducted annually by a County-approved biologist to update the location of special-status plant species populations on project plans until the end of the construction period (as illustrated on Figure 5.5-2). Annual botanical survey results and documented fluctuations in populations shall be added cumulatively to project plans each year (i.e., all newly discovered populations shall be added to existing populations documented in previous years). All mapped populations shall be clearly fenced off with exclusionary fencing prior to construction in those areas. If areas supporting Pismo Clarkia and/or other sensitive plant species are determined by the County to be unavoidable then seed shall be collected from selected plants in impact areas and utilized to restore habitat in a pre-designated restoration site;

G. To avoid the removal of an estimated 163 Well's manzanitas, newly proposed well pad Signal 66C shall be realigned and reduced in size to allow installation of the two

wells within existing pre-disturbed areas (i.e., existing roadways and well pad areas). Specifically, Signal 66C shall be realigned westward toward an existing access roadway and well pad Signal 147 to avoid a dense stand of Well's manzanita; and,

H. Utilizing the manzanita survey data collected in 2003, final project plans shall clearly illustrate the location of Well's manzanita to be removed as part of the project and all manzanita to remain within 25 feet of construction activities. Prior to any construction, grubbing or tree removal, each manzanita within the vicinity of the subject pads shall be clearly marked for removal or protection.

Protective Measures for Special-Status Wildlife:

I. A County-approved biologist shall conduct pre-construction surveys to determine presence/absence of California horned lizard within and adjacent to individual well pads containing suitable chaparral and/or scrub habitat. Surveys shall only be required during the active period of California horned lizards (generally April through September). If California horned lizards are identified adjacent to and/or within work areas, then hand rakes or an equivalent shall be utilized by biological monitors to scarify the ground surface and encourage the horned lizards (and other wildlife) to vacate the immediate area prior to construction. Alternatively, sampling composed of drift fences shall be used to capture horned lizards. As necessary, the County-approved biological monitor shall physically relocate California horned lizard to suitable habitat located outside the construction zone. Exact procedures and protocols for relocation shall be based upon pre-project consultation with CDFG;

J. A County-approved biological monitor shall be on-site during all vegetation clearing and shall periodically monitor the project site during construction activities to inspect protective fencing, equipment staging areas, and physically relocate/remove any special-status wildlife species entering the construction zone (i.e., California horned lizard, etc.). All special-status species shall be relocated to suitable habitat located outside the construction zone by a qualified biologist. Exact procedures and protocols for relocation shall be based upon pre-project consultation with CDFG; and,

K. Mitigation Measure Bio-2 (nesting bird surveys shall be conducted between February 15 and August 15 to identify nest sites of special-status bird species including American peregrine falcon, horned lark, northern harrier, and Cooper's hawk).

Residual Impacts: Implementation of this mitigation measure will reduce potential impacts to special-status species to less than significant levels.

Impact BIO-4: Construction activities could result in direct and indirect impacts to special-status species potentially occurring within the nearby Pismo Creek and associated tributaries.

Discussion: Special-status aquatic species, including California red-legged frog, two-striped garter snake, western pond turtle, and south-central California coast steelhead

have the potential to occur within the Pismo Creek watershed. Further, tidewater goby is known to inhabit the lower reaches of Pismo Creek. Although some of these species are strictly aquatic, such as steelhead and tidewater goby, several of these species use upland habitat for forage and cover, as well as the aquatic habitat present within Pismo Creek. Examples of these species include the southwestern pond turtle, two-striped garter snake, and the California red-legged frog, as well as several bird species (e.g. yellow warbler, southern willow flycatcher, etc.).

Construction activities within close vicinity of the creek could result in direct impacts to semi-aquatic species that utilize the upland areas of the watershed, disrupt the natural behavior patterns of special-status species (i.e., breeding activity) and/or result in indirect impacts to aquatic species due to sedimentation and inadvertent spills. Well pads located within 250 feet of Pismo Creek include Signal 113 D, ~~and~~ Signal 151, and Morehouse 303. In addition, proposed well pad modifications at Rock 85A have the potential to impact a deeply incised drainage channel which borders the pad to the north. However, with implementation of Mitigation Measure BIO-3 listed above, a qualified biologist shall conduct pre-construction surveys for special-status wildlife species and conduct monitoring on a periodic or full-time~~,~~ basis, as described in BIO-3 and BIO-4, respectively.

~~Further, s~~Special-status plant species including black-flowered figwort and Pismo clarkia have been identified within the vicinity of the above listed well pads. ~~However, with implementation of~~ As described in Mitigation Measure BIO-3 listed above, a qualified biologist shall conduct pre-activity surveys to determine the location and extent of all special-status plant species occurring within and adjacent to individual well pads, including Signal 113 D, Signal 151, Morehouse 303, and Rock 85A. Additionally, nesting bird surveys shall be conducted prior to construction within these areas. Therefore, impacts to special-status plant species (black-flowered figwort and Pismo clarkia) and nesting birds (e.g. yellow warbler, southern willow flycatcher, etc.) shall be avoided and/or minimized to the extent feasible. However, impacts to southwestern pond turtle, two-striped garter snake, and the California red-legged frog occurring in upland habitat areas is still considered likely.

The expected increased sediment load during short-term construction activities has the potential to impact existing habitat and water quality of Pismo Creek. However, as discussed in Section 5.7 – Geology and Soils, implementation of a site-specific erosion control plan during and subsequent to construction activities would minimize the potential for short-term sedimentation impacts to Pismo Creek. Although an inadvertent oil spill into Pismo Creek is considered low due to the distance of the majority of proposed well pad construction from the creek, the potential still exists for such occurrence. As discussed in Section 5.10 – Hazards, PXP shall prepare and implement a Spill Response Plan that includes provisions for avoiding and/or minimizing impacts to Pismo Creek in the event of a spill. With implementation of these measures, impacts to Pismo Creek due to sedimentation and inadvertent oil spills would be considered less than significant.

Impact Category: Southwestern pond turtle, two-striped garter snake, and California red-legged frog = Class 2.

Thresholds of Significance: 1 and 9

Mitigation Measure: BIO-4: The following mitigation measure is recommended to avoid and/or minimize impacts to special-status species known to occur or with the potential to occur within the Pismo Creek watershed:

A. ~~A.~~ Construction (e.g., clearing and grubbing of vegetation, rough grading, drilling, etc.) of any previously undisturbed area located within a buffer zone of 100 feet from both sides of Pismo Creek's banks (San Luis Obispo County Land Use Ordinance 22.07.166) shall be prohibited. Pismo Creek and the required 100-foot buffer shall be illustrated on final project plans and adhered to during the construction period;

B. Both Morehouse 303 and Signal 151 are within the 100-foot creek setback; a portion of Signal 151 is also within the 100-year floodplain. These two pads already exist and have been previously disturbed, such that annual grassland represents the dominant vegetation cover at these sites. As such, only a 50-foot creek setback from the top of bank will be required at these two pads. However, grading and drilling will be restricted to previously disturbed areas and no riparian vegetation will be removed. In addition, because the pads are not located outside of the 100-foot creek buffer zone applied to other pads, drilling and construction will be prohibited on these pads during the nesting bird season. Berming will also be established at these sites to contain migration of miscellaneous drilling materials and will be at a height at least one-foot above the 100-year base flood elevation to prevent secondary, indirect impacts to special-status species that have the potential to occur in adjacent areas(refer also to existing mitigation measures BIO 3 and BIO 4, respectively). A 100-foot setback will be observed for all other pads/construction areas, except well pad Rock 85A. Rock 85A, which is a proposed new pad, is within 100 feet of an unnamed blue-line stream, as shown on a standard 7.5-minute USGS quadrangle map. This blue-line stream is a small intermittent drainage that flows through a culvert underneath Price Canyon Road and connects with Pismo Creek. Because this drainage is currently degraded due to past land use practices and existing sedimentation impacts, construction will be allowed to occur within 50 feet of top of bank with establishment of appropriate one-foot berming as discussed above.

C. The applicant may be allowed to construct within 30 feet of top of bank at Rock 85A if a complete restoration plan for the unnamed blue-line stream is submitted to the County prior to implementation of construction activities at this pad. Restoration shall include provisions for removal of non-native plant species and planting of native, riparian vegetation to enhance the habitat value for special-status species.

D. Construction (not including drilling activities) of those previously disturbed areas located within the buffer zone of 100 feet from both sides of Pismo Creek's banks (limited only to Signal 151, Morehouse 303, and Rock 85A) shall be monitored by a qualified biologist on a full-time basis. The biological monitor shall conducted pre-

construction surveys for special-status wildlife species, maintain protective fencing, inspect equipment staging areas, and physically relocate/remove any special-status wildlife species entering the construction zone; and,

E. Mitigation Measure BIO-3.

Residual Impacts: Implementation of this mitigation measure will reduce potential impacts to special-status wildlife species occurring within Pismo Creek to less than significant levels.

Long-Term Impacts. The following are the potential impacts associated with the conversion of natural habitats within project sites and the long-term operation and maintenance of the site on biological resources.

Impact BIO-5: Implementation of the Phase IV Expansion will result in the removal of up to 46 coast live oak trees and an additional 107 oak trees could be impacted by proposed activities.

Discussion: An estimated 46 coast live oak trees, located within and adjacent to the newly proposed and existing well pads, would be removed to accommodate the proposed Phase IV expansion. An estimated 107 oak trees have the potential to be impacted by proposed activities, which may include rough grading within the drip line of the trees, and/or pruning of major limbs to facilitate equipment and installation of the new wells. All tree specimens considered in this analysis have diameters at breast height (DBH, 4.5-feet above grade) exceeding 4 inches. Potential impacts were quantified as part of the oak tree survey conducted on-site and summarized in the following Table 5.5-7 – Oak Tree Impact Summary Table. All oak trees to be removed or impacted by project activities were numbered in the field and marked on site maps. It should be noted that approximately 80% of the total estimated mature coast live oaks to be removed as part of the proposed project would result from construction of new well pads Maino 16NW, Signal 66C, and Signal 113D, with Maino 16NW representing 61% of the total oaks to be removed.

Table 5.5-7
Oak Tree Impact Summary Table

Well Pad Location	Code	New/ Existing	Disturbed (AC)	# of New Wells	Oak Trees to be Removed (I.D. Nos.)	Oak Trees to be Impacted (I.D. Nos.)
Hyla 17H*	H17H	E	0	6	0	0
Hyla 19H/Maino 1	H19H	E	0.26	3	0	114,115,116
Hyla Island*	HI	E	0	5	0	0
Maino 16NW	M16NW	N	0.45	4	141,143,144,147, 148,149,152,153, 154,155,156,157, 160,161,162,163, 164,165,166,169, 170,171,172,173, 174,175,176,177	142,145,146,150, 151,158,159,167, 168,178,179,180, 181
Maino 17NW*	M17NW	E	0	2	0	0

Well Pad Location	Code	New/ Existing	Disturbed (AC)	# of New Wells	Oak Trees to be Removed (I.D. Nos.)	Oak Trees to be Impacted (I.D. Nos.)
Maino 18J*	M18J	E	0	5	0	0
Maino 18L (Maino 19L01, Maino 18SIL, Maino 15	M18L	E	0.09	2	76	71,72,73,74, 75,77,78,79
Maino 19J	M19J	E	0	4	0	111,112,113
Maino 19L (Maino 19SPL)	M19L	E	0.11	1	0	81,82,83,84,85 86,87,88,89
Maino 19N	M19N	E	0.34	5	137,138,139	126,127,128,129, 130,131,132,133, 134,135,136,140
Maino 21J	M21J	E	0.39	2	0	90,91,92,93,94, 95,96,97
Maino 21L (Maino 16)	M21L	E	0.52	1	0	99,100,101,102, 103,104,105,106, 107,108,109,110
Maino Triangle*	MT	E	0	5	0	0
Morehouse 303*	MH303	E	0.76	20	0	0
Rock 4	R4	E	0.08	1	6	1,2,3,4,5,7,8
Rock 11N*	R11N	E	0	1	0	0
Rock 12K*	R12K	E	0	2	0	0
Rock 12M*	R12M	E	0	4	0	0
Rock 13L*	R13L	E	0	3	0	0
Rock 85A	R85A	N	0.84	6	0	61,62,63,64, 68,69,70
Rock 86	R86	E	0.04	1	0	9,10,11
Rock 401*	R401	E	0.5	2	0	0
Rock Island*	RI	E	0	5	0	0
Signal 10M*	S10M	E	0.03	1	0	0
Signal 11L	S11L	E	0.3	2	0	24,25,26, 29,30,31
Signal 66C	S66C	N	0.52	2	43,44,45,46,47	48,49
Signal 101 (Signal 9LI)	S101	E	0.01	1	37,38,41	39,42
Signal 102 (PG 406.5)	S1026	E	0.13	1	0	50,51
Signal 102 (PG 408.5)	S1028	E	0.18	1	0	52,53,54,55, 56,57
Signal 105 (Signal 10-5L)*	S105	E	0.02	1	0	0
Signal 106*	S106	E	0	2	0	0
Signal 113A	S113A	N	0.87	1	120,121,122,123	0
Signal 113D	S113D	E	0.18	7	0	123,124
Signal 150*	S150	E	0	10	0	0
Signal 151	S151	E	0.28	4	119	117,118
Signal P1-I1*	SP1	E	0	2	0	0
Totals	**--**	**--**	**6.9**	**125**	**46**	**107**

* Assumes no grading required and installation of new wells would avoid impacts to existing oak trees located within and adjacent to subject pads (i.e., existing oak trees either upslope and/or off of well pads).

Oak woodland is considered to be a sensitive habitat and is already fragmented in much of the proposed Phase IV area. Further, oak trees provide food, cover, nest, and roost habitat for a number of species, particularly birds. It is a violation of Section 3503 of the California Fish and Game Code to take, possess, or destroy the nests and/or eggs of birds-of-prey, such as red-tailed hawk, red-shouldered hawk. The Federal Migratory Bird Treaty Act provides similar protection for nesting migratory bird species.

Consequently, removal of any tree while migratory or other protected bird species are nesting would be a Class 2 impact.

Impact Category: Class 2

Thresholds of Significance: 2, 9

Mitigation Measure: **BIO-5**: The following mitigation measures are recommended to mitigate impacts to oak trees due to project implementation. This includes protective measures to avoid and/or minimize impacts to oak trees designated for long-term preservation:

A. To avoid the removal of an estimated 9 mature oak trees, the applicant shall implement provision A of Mitigation Measure BIO-3 listed above (modification of well pad Signal 66C to avoid tree removal). In addition, the northern corner of Signal 113A shall be realigned southward to avoid four existing mature coast live oak trees. These modifications shall be displayed on final project plans prior to construction; and,

B. Prior to construction of the 1st improvement authorized under this approval, a Habitat Enhancement Plan containing site-specific oak tree protection and replacement procedures shall be prepared for the project. The Habitat Enhancement Plan shall clearly outline the procedures for protecting oak trees to remain in place during construction and provide details for replacing oak trees that are removed at a 4:1 ratio and those impacted at a 2:1 ratio. Final specifications of the Habitat Enhancement Plan shall be approved by the County and CDFG prior to construction of the 1st improvement. At a minimum, the plan shall contain the following provisions:

- Utilizing the oak tree survey data collected in 2003, final project plans shall clearly illustrate the size and location of all oak trees to be removed as part of the project and all oak trees to remain within 25 feet of construction activities. Prior to any construction, grubbing or tree removal, each mature coast live oak tree within the vicinity of the subject pads shall be clearly marked for removal or protection;

- Protective fencing shall be installed around each oak tree to remain in place. The fencing shall be installed prior to grubbing/construction and provide protection of the root zone of oak trees (the outer edge of the tree root zone is 1-1/2 times the distance from the trunk to the drip line of the tree);

- To further protect oak trees to remain in place, a certified arborist shall be retained by the applicant to perform any necessary trimming of oak tree limbs overhanging existing well pads and newly proposed well pads. This shall be conducted prior to allowing construction equipment and drilling rigs within well pads to avoid and/or minimize the potential for inadvertent damage to oak trees limbs (i.e., from drilling rig booms, etc.);

- ~~Approximately 25% percent of the r~~Replacement oak trees shall be from ~~15-gallon stock and the remaining 75% from~~ vertical tubes or deep, one-gallon container stock. The 1~~5~~-gallon stock shall be evenly placed along the perimeter of the most visually prominent well pads as seen travelers on from Price Canyon Road (i.e., Maino 16NW);

- Replanting shall be completed in the fall season ~~as soon as feasible (i.e.,~~ upon completion of grading within a given area~~)~~ and by a qualified individual familiar with native vegetation;

- Location of newly planted oak trees shall adhere to the following whenever possible: on the north side of and at the canopy/dripline edge of existing mature native trees; north-facing slopes; within drainages swales; where topsoil is present; and if clustered, at least 10' "on-center" separation between each tree. Tree spacing will average approximately 15 feet on-center. Some clustering is acceptable to maintain a more natural appearance; and,

- Newly planted trees shall be maintained until successfully established. This shall include protection (e.g., caging, tree shelters) from burrowing and browsing animals (e.g., deer, rodents), regular weeding (minimum of once early fall and once early spring) of at least a 3-foot radius around the plant base and adequate watering (i.e., drip irrigation system). Heavy mulching consisting of local oak leaf litter/mulch so seedlings are exposed to local mycorrhizal fungi to enhance survivability and growth is also recommended. Irrigation shall be slowly terminated over a 3-year period. If possible, planting during the warmest, driest months (June through September) shall be avoided. Replacement oak trees identified as dead and/or diseased during the monitoring period shall be replaced accordingly.

C. Mitigation Measure Bio-2 (the tree removals shall be conducted as to avoid a take of raptors or migratory birds).

Residual Impacts: Implementation of the above listed mitigation measure will reduce project impacts to oak trees to less than significant levels.

Impact BIO-6. The proposed Phase IV Expansion will result in the permanent loss and/or long-term degradation and fragmentation ~~disturbance~~ of natural habitats, which provide forage, cover, and breeding elements for a wide variety of wildlife species, including several special-status species.

Discussion: Plant communities existing along the perimeters of facility well pads and roadways have been previously disturbed by past oil field operations (e.g., clearing and grading, long-term dust impacts, etc.). Although portions may be intact, the habitat value of these plant communities has been substantially reduced due to fragmentation, introduction of non-native vegetation, and ongoing disturbance. However, the proposed project includes the installation of four new well pads and the modification of several

pads that have been primarily utilized for cattle grazing. These include new well pads Signal 66C, Rock 85A, Maino 16NW, Signal 113A; and proposed modification/expansion of well pads Morehouse 303, Signal 113D, and Signal 151. Ultimate construction/modification of these well pads would result in the permanent and temporary loss of the plant communities existing within the project area and result in further degradation of habitat supporting special-status species, including Well's manzanita and Pismo clarkia. The estimated total loss for each cover type within these well pads is provided below in following Table 5.5-8:

Table 5.5-8
Plant Community Impact Summary Table

Plant Community	Loss (acres)
Calif. live oak woodland series	0.45
Well's manzanita series	0.52
Coyote brush series	0.26
Calif. annual grassland series	2.67
Total Acreage:	**3.9**

Note: The remaining estimated 3.0 acres of disturbance is expected to occur in pre-disturbed habitat areas (i.e., ruderal).

Loss of non-native annual grassland areas is not considered a significant impact to wildlife because it supports a relatively low density and diversity of species and is considered abundant both locally and statewide. However, loss of California live oak woodland habitat and Well's manzanita series (central maritime chaparral) is considered significant because of their high habitat value and declining abundance of these habitat areas within San Luis Obispo County. Although coyote brush scrub provides moderate foraging and nesting habitat for wildlife species ~~coyote brush scrub~~ is not considered a sensitive plant community. Therefore, loss of 0.26 acres of coyote brush scrub is not considered a significant impact.~~, this cover type also provides moderate foraging and nesting habitat for a variety of wildlife species~~.

The loss of the 0.45 acre of California live oak woodland habitat would occur as a result of proposed new well pad Maino 16NW and the loss of 0.52 acre of Well's manzanita series would occur as result of proposed new well pad Signal 66C. Implementation of provision A of Mitigation Measures BIO-3 and BIO-5 (listed above) would minimize impacts through modification of new pads to avoid removal of intact Well's manzanita habitat and several mature oak trees. However, based on Table 5.5-6 (above) project implementation would ultimately result in the permanent loss of approximately 12 Well's manzanitas and potential impacts to an additional 41. Moreover, construction of additional pads and modification/expansion of existing well pads throughout the oil field would result in further degradation of adjacent habitat areas known to support special-status species (e.g., Well's manzanita, Pismo clarkia, etc.).

Impact Category: Loss of the California live oak woodland series, Well's manzanita series ~~,~~ ~~coyote brush series~~ = Class 2; Loss of California annual grassland and coyote brush series ~~cover~~ = Class 3

Thresholds of Significance: 1, 2~~, 3~~, and 9

Mitigation Measure: BIO-6: The following measures shall be implemented to compensate for the permanent loss of vegetation resulting from project implementation and potential long-term degradation of adjacent habitat areas from projected long-term utilization of the site:

A. Prior to construction of the 1st improvement authorized under this approval, the applicant shall dedicate an open space easement within the PXP property for long-term preservation. The dedicated easement shall be sufficiently sized and contain suitable habitat to accommodate a portion of the required oak replacement (estimated at 398 total), Pismo clarkia planting, and Well's manzanita planting. A conceptual location for the easement with approximate boundaries has been identified directly southwest of Signal 9N (refer to Figure 5.5-3). Please note that the exact location, size, and shape of the mitigation area are conceptual. The area contains a representative mixture of oak woodland, Well's manzanita series, and annual grassland with a known population of Pismo clarkia. Final specifications of the dedicated easement (size and location) shall be reviewed and approved by the County and CDFG prior to construction of the 1st improvement. In addition, future equipment staging areas, access routes, and additional well pads shall be prohibited in the dedicated easement area; and,

B. Provision B of Mitigation Measure BIO-5 (Habitat Enhancement Plan) shall also contain measures to offset impacts to Pismo clarkia, Well's manzanita and oak woodland within the dedicated easement area. Specifically, the Habitat Enhancement Plan shall include species lists, installation and maintenance methods, performance criteria, and monitoring protocols for enhancing existing habitats within the dedicated easement area. At a minimum, the plan shall contain the following additional provisions:

    - Procedures to further mitigate permanent loss of California live oak woodland by augmenting existing oak woodland habitat within the dedicated easement with a portion of the required 4:1 ratio oak tree plantings;

    - Estimated permanent loss of 12 Well's manzanitas will also be compensated at a replacement ratio of 4:1 within selected areas of the dedicated easement containing appropriate soil conditions (i.e., chaparral and coyote brush scrub habitat areas);

- Planting of Pismo clarkia as required by Mitigation Measure BIO-3 shall occur within selected areas of the dedicated easement to augment existing populations, concentrating the majority of seed dispersal along the northeastern perimeter of the existing oak woodland habitat;

- Installation of all replacement planting and/or seed dispersal shall be conducted within the appropriate season to promote survivability (i.e., fall/winter). If possible, planting during the warmest, driest months (June through September) shall be avoided;

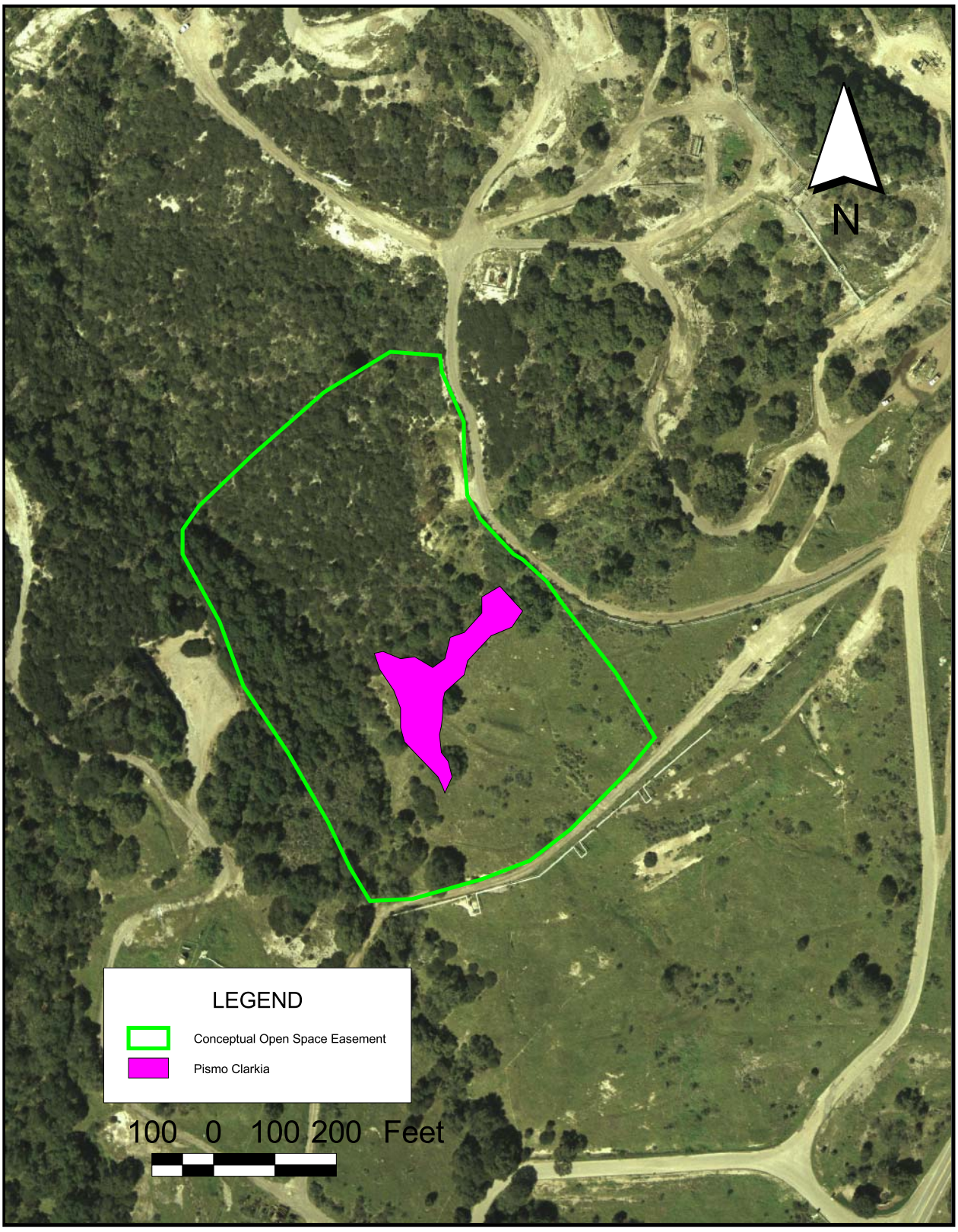
- Shall provide procedures to ensure eradication of exotic plant species (i.e., pampus grass, tree tobacco, etc.) within the dedicated easement. This shall include provisions for controlling the spread of exotic species throughout the Phase IV expansion area; and,

- Shall provide an implementation schedule which emphasizes initiation of the Habitat Enhancement Plan within the 1st year of improvements authorized under this approval. The schedule shall outline the sequencing of all mitigation planting and timing for long-term monitoring and maintenance of the dedicated open space easement through the life of the project.

Residual Impacts: Implementation of the above listed measures will reduce long-term project impacts to natural habitats supporting special-status species to less than significant levels.

5.5.3.3 Cumulative Impacts

As discussed in Section 8.2 of this EIR, cumulative projects include King South Ranch and Tentative Tract Map no. 2388 which would result in the development of low density residential land uses, a hotel, golf course and vineyards. Price Canyon is a biologically significant area that supports numerous sensitive plant and animal species and natural communities (central maritime chaparral), such that construction of either the King South Ranch Project or the Tentative Map Tract no. 2388 may result in impacts to biological resources. Specifically, these projects have the potential to result in further removal and degradation of vegetative communities due to construction of permanent structures, introduction of impervious surfaces, and conversion of natural areas to vineyards and golf courses. This may also result in indirect impacts to Pismo Creek and associated biological resources. It is possible that construction of either of these projects may result in incremental impacts to biological resources within the area. However, these cumulative impacts are not expected to alter the significance of biological resources impacts associated with the proposed project.



Source: EDA

padre associates, inc.
ENGINEERS, GEOLOGISTS & ENVIRONMENTAL SCIENTISTS

CONCEPTUAL OPEN SPACE EASEMENT

FIGURE 5.5-3

5.6 CULTURAL RESOURCES

This section provides an analysis of the impacts of the proposed project on archaeological resources, both prehistoric and historic. Impacts to paleontological resources are covered under Section 5.10. The proposed impacts and mitigation measures are based on two reports entitled "*Phase One Archaeological Surface Survey for the Shell Western E&P Project, Price Canyon Oil Field, San Luis Obispo, CA* and " Results of Addendum *Archaeological Surface Survey for a 65 Acre Area of the Plains Exploration and Production Phase IV Project, Price Canyon, San Luis Obispo County, CA,* conducted by Robert O. Gibson, (1992, 2003), and review conducted by Mr. Gibson of the proposed project. The first survey conducted in 1992 included about 200 acres and the second survey performed in 2003 included 65 acres.

5.6.1 Setting

San Luis Obispo County has been home to the Northern Chumash, or Obispeno, for over 9,000 years. Archaeologists have established a detailed cultural chronology based upon excavations and site surveys across the County (Greenwood, 1972; Gibson, 1979, Jones and Waugh 1995). Over 1,000 archaeological sites have been recorded in San Luis Obsipo County, although many of these heritage resources have been destroyed or damaged by development.

Central Coast prehistory is divided into three broadly defined periods – the Early, Middle and Late. The Early Period dates from the arrival of humans in the county more than 10, 000 years before present to 2,600 years before present. A local site at Diablo Canyon, SLO-2, was dated between 8,900 and 9,300 years ago (Greenwood, 1972). Early Period sites often contain milling stones and manos which indicate use of seed plants, in addition to shell middens left from intensive harvesting of shellfish (Erlandson 1994). A basic array of rectangular shell bead ornaments also occurs throughout the Early Period. Village life was well organized with formal cemeteries and specialized resource sites being used. Interior areas were also settled during the early Period.

The Middle Period of Central Coast Chumash prehistory spans from 2,600 years before present to 750 years before present. During this time, Chumash society became increasing complex with political and religious power structures. Artifact types change in the Middle Period and shell ornaments become more diverse. An important economic adaptation, the use of acorns, is indicated by the decline in milling stones and the increased use of mortars and pestles. Population size increased and trade networks became very well established in the Middle Period. Some cemeteries show evidence of warfare.

The Late Period covers the years from 750 years before present to historic times 150 years before present. Complex economic changes included the invention of money (shell beads) with all its implications of wealth and power. There was a decreasing reliance on coastal resources and a shift to interior settlements. With the arrival of the Spanish, especially after 1769 A.D., rapid changes altered Chumash political and economic achievements as well as reduced the size of the population through decimation by foreign diseases. Many contemporary Chumash maintain spiritual and cultural links to their rich heritage.

The project site is within the Obsipeno Chumash culture area. It has been used for ranching since the establishment of the Mission San Luis Obispo in 1772. A Mexican land grant of

30,911 acres called the Rancho Corral de Piedra, was established in February 11, 1841. This agricultural activity was continued after the establishment of the State of California through the 19th century, during which time the canyon was named after John Price, owner of 7,000 acres and local magistrate (Gibson 1992:6).

Previous Heritage Studies

On November 26, 1992, R.O. Gibson of Gibson's Archaeological Consulting conducted an archival records search of an area 1/4 mile around the 200-foot project area and Phase I surface survey of 200 acres as part of the Phase III development plan proposed by Shell Western Exploration and Petroleum. The Phase I survey involved evaluation of all slopes less than 30 percent, and low sandstone rock outcrops were examined for the presence of bedrock mortars. Previously recorded archaeological sites in the project vicinity were mapped and survey boundaries defined. A report of results was prepared that summarized the previous surveys (Gibson 1992). The current Phase IV project area includes about 65 acres that were not previously surveyed. This area is between two areas done for the 1992 survey area.

The 1992 archival records search at the Central Coastal Information Center at the University of California at Santa Barbara was conducted for a 1/4 mile area around the 264-acre project area. This yielded information on:

- Previously surveyed tracts within or near the project;
- Previously recorded sites within or near the project;
- Characteristics of previously recorded properties; and,
- Dates of previous survey and excavation programs and technical reports.

The Information Center reported that since 1977, three previous surveys had been conducted, Robert Hoover (1977, 1978) and W.B. Sawyer (1989) and had identified three prehistoric archaeological sites (SLO-353, SLO-652, and SLO-1266) and one historic archaeological site, the Corral de Piedra (Stone Corral). Site records were updated for the Hoover sites: SLO-353 and SLO 652. These two sites are part of the same site that has been divided by Price Canyon Road. The road construction, prior to 1964, also unearthed three Chumash burials.

SLO-353

SLO-353 is a prehistoric site, located east of Price Canyon Road and first recorded in 1963 by H.L. and L.D. Wadhams. It was re-recorded in 1969 by Charles Dills and again in 1977 by Robert Hoover. The site measures about 200 meters east-west and 150 meters north-south. The site contains a concentration of weathered small shellfish fragments consisting of at least nine species from both sandy beach and rocky coast environments (probably Pismo Beach and Shell Beach areas). Ground stone and chipped stone tools and debitage (by-products from stone tool manufacture) were present in low to medium densities. One projectile point (arrowhead) may be stemmed form suggesting a Middle period occupation perhaps 1,000 to 2,500 years ago.

At the lower eastern part of the site is a 15 by 20 meter sandstone rockcrop that contains at least 18 bedrock mortars. A second small outcrop has two additional mortars.

SLO-652

SLO-652 is located west of Price Canyon Road and would have originally been connected to SLO-353 before the road was cut. This site was first recorded by Charles Dills in 1972 and measures about 150 meters East-West and 200 meters North-South. The northern 1/3 of the site contains a concentration of weathered shellfish fragments (same species as SLO-353) in a dark gray to black sandy soil. The other 2/3 of the site consists of trace to low densities of chipped stone materials with rare shell fragments.

One larger and three smaller low bedrock outcrops contain mortar depressions that are, overall, deeper than the outcrop at SLO-353 but fewer in number. The main shell concentration is located just north of the larger rock outcrop.

In 1977 Robert Hoover directed subsurface testing at SLO-652. Two 1 by 1 meter test units were excavated and 200 soil samples were collected for pH analysis. The test units recovered burnt rock, chert flakes and cores, boiling stones, small shell fragments and bone. Projectile and biface knife fragments suggest Middle period of occupation for both sites (1,000 to 3,000 years old).

SLO-1266

SLO-1266 is a small prehistoric site recorded in 1989 by W. B. Sawyer. It is located just north of Tiber Canyon Road and consists of a gentle sloping terrace measuring 50 by 100 meters. Noted were a concentration of chert flakes with rare shell fragments (same at the other two sites), burnt rock and some bedrock mortars. No new information was gathered in the 1992 survey.

Other Cultural Materials

Tar Seeps were recorded in two locations near Price Canyon Road but no prehistoric cultural materials were noted in either location. These seeps were probably visited by Chumash, prehistorically and were utilized during the Mission Period as recorded by the Spanish missionaries. The Chumash word for tar is "pismu'".

Historic/Modern Materials were recorded during the survey of a 32-acre area (Gibson 1992:11). The materials were near existing wells # 150, # 151, and # 157 and consisted of fragments of Pismo clam and some glass. One chert flake was noted but was sharp and it was unclear if it was prehistoric or mechanically broken natural chert. No chert flakes, burnt rock or species of shellfish were noted in this area. It was concluded the shell fragments were historic or modern, probably dating to post World War II.

Addendum Heritage Study

After preliminary review, it was determined that an additional 65 acres of potential development area of the Phase IV Project area was not included in the original 1992 archaeological study area. These 65 acres are located between two areas that were surveyed in 1992. In December 2003, the 65-acre area was surveyed. No new archaeological sites or other cultural resources were identified.

Site Locations

A review of original archaeological site records, updated site records and field observations and reports were used to plot all cultural materials on current project maps. As designed, the Phase IV project has placed the three recorded prehistoric sites in Environmentally Sensitive Areas (ESA), which are areas that will be avoided by project activities. See Figure 3-5. The two prehistoric sites, SLO-353 and SLO-652, are within ESA 1 and SLO-1266 is within ESA 2. The project site also contains three areas (Areas A, B, and C) that contain historic/modern materials The historic to modern cultural materials are located outside any areas that will be disturbed and should not be directly affected by the Phase IV project.

5.6.2 Impact Analysis

5.6.2.1 Thresholds of Significance

The following section analyzes the potential effects of the proposed project on cultural resources in the project area.

Standards of Significance

Based on the mandatory findings of significance criteria at Section 15065 and Appendix G of the State CEQA Guidelines (Governor's Office of Planning and Research, 1999), an impact would be significant if any of the following conditions, or potential thereof, would result with implementation of the Proposed Project:

1. Cause a substantial adverse change in the significance of a historical resource as defined in Section 15065.5;
2. Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5; and,
3. Disturb any human remains, including those interred outside of formal cemeteries.

Section 15064.5 defines a significant adverse effect to include any activity that would: (1) Create a substantially adverse change in the significance of an historical resource including physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings, such that the significance of an historical resource would be materially impaired; and/or (2) alter or materially impair the significance of a historical resource.

Section 15064.5 of the CEQA Guidelines defines significant historic resources to include:

- A resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the California Register of Historical Resources (Pub. Res. Code SS5024.1, Title 14 CCR, Section 4850 et seq.).
- A resource included in a local register of historical resources, as defined in section 5020.1(k) of the Public Resources Code or identified as significant in an historical resource survey meeting the requirements section 5024.1(g) of the Public Resources Code, shall be presumed to be historically or culturally significant.
- Any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military,

or cultural annals of California may be considered to be an historical resource, provided the lead agency's determination is supported by substantial evidence in light of the whole record including the following: (A) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage; (B) Is associated with the lives of persons important in our past; (C) 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) Has yielded, or may be likely to yield, information important in prehistory or history.

- The fact that a resource is not listed in, or determined to be eligible for listing in the California Register of Historical Resources, not included in a local register of historical resources (pursuant to section 5020.1(k) of the Public Resources Code), or identified in an historical resources survey (meeting the criteria in section 5024.1(g) of the Public Resources Code) does not preclude a lead agency from determining that the resource may be an historical resource as defined in Public Resources Code sections 5020.1(j) or 5024.1.

Section 15064.5 of CEQA defines material alteration of a significant resource to include any activity that:

- Demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion in, or eligibility for, inclusion in the California Register of Historical Resources; or,
- Demolishes or materially alters in an adverse manner those physical characteristics that account for its inclusion in a local register of historical resources pursuant to section 5020.1(k) of the Public Resources Code or its identification in an historical resources survey meeting the requirements of section 5024.1(g) of the Public Resources Code, unless the public agency reviewing the effects of the project establishes by a preponderance of evidence that the resource is not historically or culturally significant; or,
- Demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its eligibility for inclusion in the California Register of Historical Resources as determined by a lead agency for purposes of CEQA.

Section 7050.5 of the Health and Safety Code, states that in the event human remains are discovered during excavation, work must stop immediately and the County Coroner must be contacted. Section 5097.94 and 5097.98 of the Public Resources Code require consultation with the Native American Heritage Commission, protection of Native American remains, and notification of most likely descendants. SB 447 (Chapter 404, Statutes of 1987) also protects Native American remains or associated grave goods.

Section 15064.5 of the CEQA Guidelines defines significant historic resources to include:

A resource listed in or determined to be eligible by the State Historical Resources Commission, for listing in the California Register of Historical Resources (Pub. Res. Code SS5024.1, Title CCR. Section 4850 et seq.).

5.6.2.2 Short-Term Impacts

Impact CUL-1: Construction during the proposed project could result in the inadvertent damage to historic, cultural, archaeological, and/or burials during earthmoving activities.

Discussion: The project site contains three prehistoric sites: SLO-353, SLO-652, and SLO-1266. It also contains three areas (Areas A, B, and C) that contain historic/modern materials. Construction activities, such as excavation and grading, and placement of flows lines and connector pipelines, could disturb these areas and cause adverse impacts to cultural resources.

Impact Category: Class 2

Thresholds of Significance: 1, 2

Mitigation Measures: **CUL-1:** Cultural Resource sites SLO-353, SLO-652, and SLO-1266 shall be avoided. Any future ground disturbances within a 150-foot buffer from the sites shall be subject to a subsurface archaeological excavation program to assess artifact presence in these areas. If artifacts do exist and cannot be feasibly avoided, a Phase 2 archaeological significance assessment program, and, if necessary, a Phase 3 data recovery mitigation program, shall be carried out by a qualified archaeologist and all construction activity within the sites and buffer areas shall be monitored by a qualified archaeologist and Native American monitor. The archaeological sites and buffer areas shall be indicated as “Environmental Sensitive Areas” on grading plans. If construction is proposed within 100 feet of the buffer areas, the areas shall be temporarily fenced to protect from disturbance. All significance assessment and mitigation activities hall be funded by the applicant. In addition, such buffer zones shall be observed for Areas A, B, and C.

CUL-2: In the event that unknown cultural remains are encountered anywhere within the project area during construction, activities shall be terminated or redirected to another area until a qualified archaeologist can be retained to evaluate the potential significance of the finds in a Phase 2 archaeological significance investigation or PXP shall have the option to relocate work permanently without need to conduct further studies at that location. Relocation of work and any subsequent archaeological investigation would be done in consultation with the County of San Luis Obispo. If they are significant and cannot be feasibly avoided, then a Phase 3 data recovery mitigation program shall be performed by a qualified archaeologist, and all construction activity within the site and 150-foot buffer area shall be monitored by a qualified archaeologist and Native American monitor. All Phase 3 significance assessments and Phase 3 mitigation activities shall be funded by the applicant.

Residual Impacts

None.

5.6.2.4 Long-Term Impacts

The proposed project will not entail excavation of land during project operations. Consequently, no impacts to cultural resources are anticipated as long as no maintenance activities involving surface disturbance occurs within the 150-foot buffer zones of ESA 1, ESA 2, and Areas A, B, and C. No additional mitigation is required.

5.6.2.5 Cumulative Impacts

Price Canyon appears to be archaeologically significant, such that construction of either the King South Ranch Project or the Tentative Map Tract no. 2388 may result in impacts to cultural resources. It possible that construction of either of these projects may result in incremental impacts to cultural resources.

5.7 GEOLOGY AND SOILS

The purpose of this section is to describe geological, drainage, erosion, and soil conditions in the project area and to evaluate potential impacts of the proposed project on these features.

5.7.1 Setting

5.7.1.1 Geology

The project is located in southern San Luis Obispo County, which is situated in the southern Coast Ranges geomorphic province of California. The southern Coast Ranges geomorphic province extends from Point Arguello in the south to the Oregon border in the north and ranges from 20 to 80 miles in width. The Coast Ranges province is bounded on the south by the Transverse Ranges geomorphic province, on the east by the Central Valley, on the north by the Klamath Ranges geomorphic province, and on the west by the Pacific Ocean.

The Coast Ranges geomorphic province is characterized by a series of northwest trending mountain ranges and valleys, many of which are bounded by faults. Rocks exposed in the southern Coast Ranges province include igneous, sedimentary and metamorphic rocks ranging in age from Jurassic to recent (see Figure 5.7-1).

San Luis Obispo County is traversed by five mountain ranges: the Santa Lucia Range, the Temblor Range, the Caliente Range, the La Panza Range and the San Luis Range. The Arroyo Grande oil field is located in Price Canyon in the southern portion of the San Luis Range.

The oldest rocks in the San Luis Range belong to the Jurassic-aged Franciscan formation, which forms the basement complex. The Franciscan formation is predominantly comprised of graywacke sandstone, with lesser amounts of shale, limestone, chert, and altered submarine volcanic rocks. Thickness of the Franciscan formation is estimated to be in excess of 25,000 feet. The Franciscan formation is unconformably overlain in the Arroyo Grande oil field by the Miocene-aged Monterey and Miocene/Pliocene-aged Pismo formations (ERCO 1981).

The Monterey formation is composed primarily of siliceous and porcelanous shales interbedded with dolomite/limestone, chert, and volcanic ash. The Monterey formation in the Arroyo Grande oil field is subdivided into four members: the Tuffaceous Member (Tmmt), the Siliceous Member (Tmmp), the Diatomaceous Member (Tmmd), and the Silty Member (Tmms) (ERCO 1981). Although no hydrocarbons are directly produced from the Monterey Formation, it is believed to be the source rock for the Arroyo Grande field reservoirs. No exploratory borings or wells have been drilled through the entire thickness of the formation, which is believed to be approximately 1,000 to 1,400 feet thick (Dames & Moore 1986).

The late Mio-Pliocene Pismo formation unconformably overlies the Monterey formation and consists of lenticular fine to coarse grained friable sandstone, calcareous siltstone, pebble conglomerate, and siliceous, cherty shale. The Pismo formation in the Arroyo Grande oil field area is subdivided into the Edna Member (late Miocene), an intermediate undifferentiated Member, and the Squire Member (Pliocene). The Edna Member is a massive buff to white coarse-grained bituminous sandstone, with layers of course pebble- or boulder-size components appearing randomly throughout the member. Bedding throughout the massive sands is indistinct or absent, with the exception of coarse-grained gravels or horizons of erosional contacts (Dames & Moore 1986).

In addition to the consolidated rock formations, recent alluvial deposits are present in the channel and flood plain of Pismo Creek. The alluvial sediments are comprised of silt, sand, and gravel and reach a maximum thickness of 100 feet near the center of the valley, becoming thinner at the margins of the valley.

5.7.1.2 Geologic Structure

The Arroyo Grande oil field lies within a structurally complex area. Significant faults in the area include the Hosgri, Nacimiento, West Huasna, and Rinconanda faults. Smaller faults include the Los Osos fault zone, the Edna fault, the Indian Knob fault; the Wilmar Avenue, the Oceano, and the Pacho faults (see Figure 5.7-2). Fault movement includes reverse, strike-slip, and normal types of displacement (ERCE 1991; Dames & Moore 1986). Price Canyon trends north-northeast, cross cutting the regional east-west or northwest-southwest structural grain. The area also contains a less well-defined north-south fault set (Dames & Moore 1986). There are no known active faults in the project area.

In addition to faulting, geologic structure in the area is influenced by folding. The Arroyo Grande oil field lies on the north flank of the Pismo syncline, a northwest trending fold that extends from Arroyo Grande Creek in the south to Morro Bay in the north.

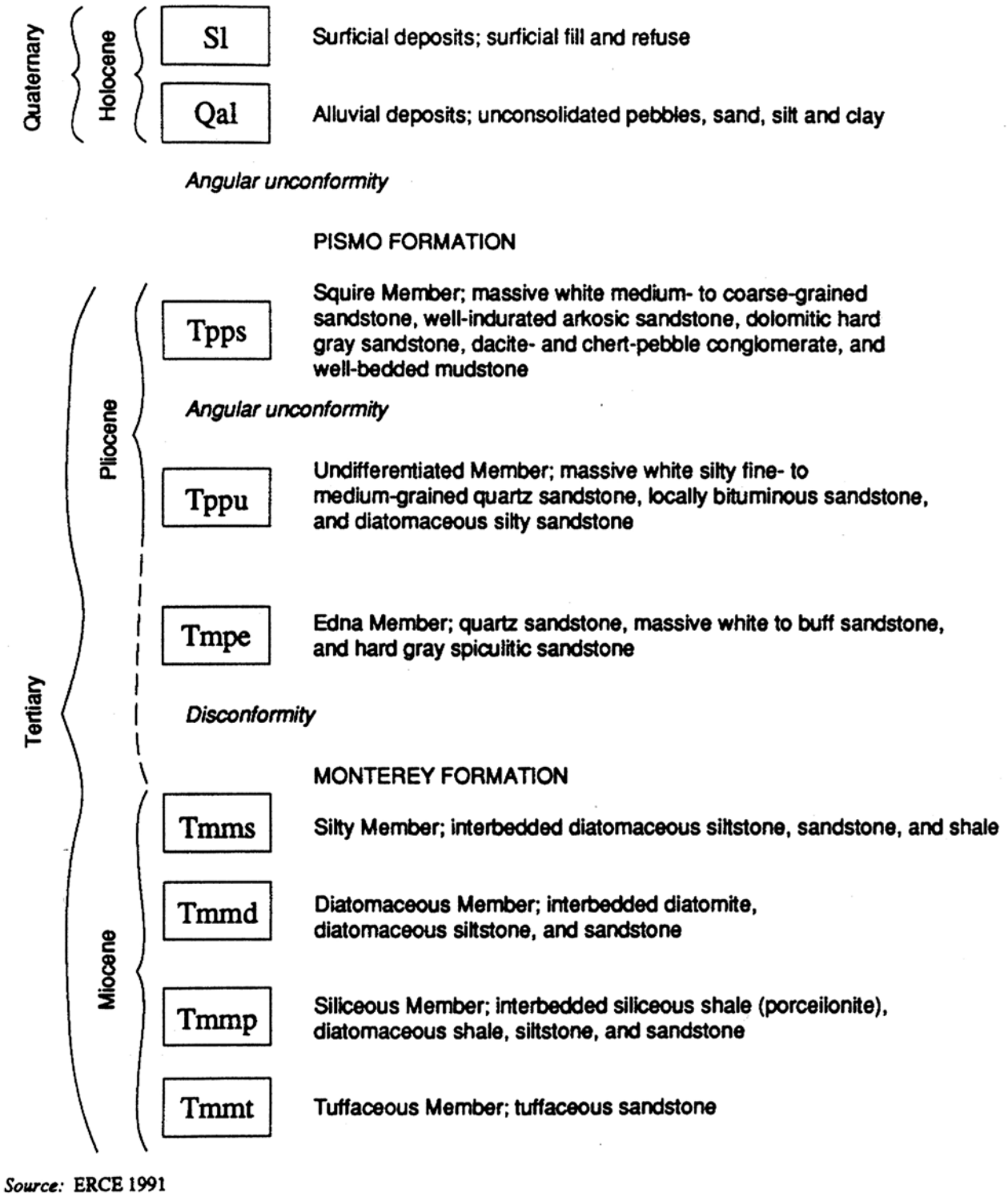
5.7.1.3 Topography

Elevations within the site range from a high of 607 feet above sea level in the northern segment of the site to approximately 100 feet above sea level on the east side of the site within the Pismo Creek drainage. The topography at the site is characterized by three main hills (rising to elevations of 442, 506, and 607 feet above sea level) separated by valleys at elevations of approximately 200 feet above sea level.

5.7.1.4 Petroleum Occurrence

The Arroyo Grande field is located on the north flank of the Pismo syncline, strata dip southwest; oil producing zones are deeper in that direction. A structural saddle in the center of the field coincides with a nearly barren zone at depth and divides the field into two major producing areas, north and south. In the northern area, where most of the currently-producing wells lie, the producing zones are shallower and structurally complex, being broken by several inactive faults into roughly half a dozen blocks. The faults isolate the individual blocks, requiring closer and more irregular well spacing to produce the available oil.

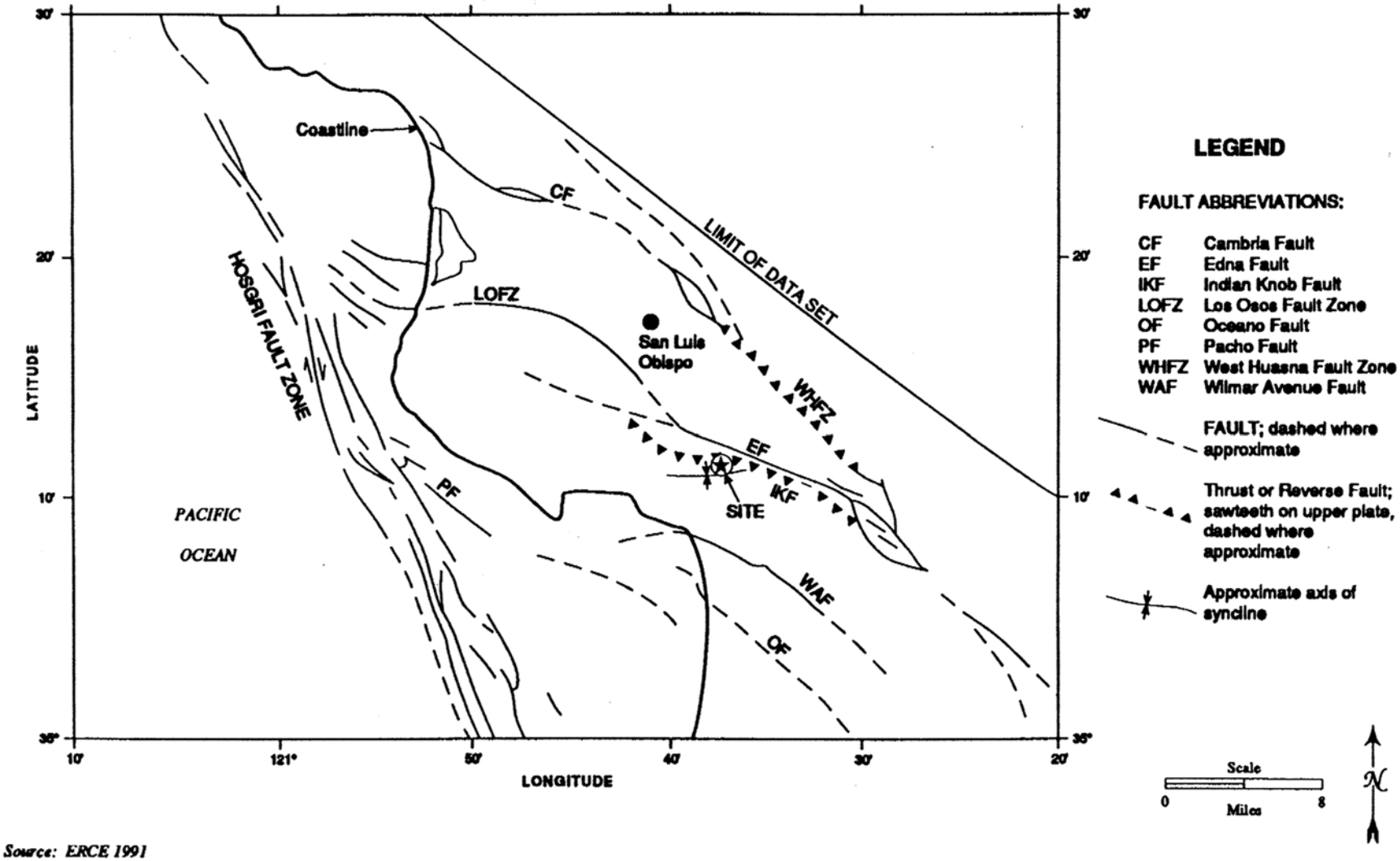
A minor amount of natural gas is produced with the oil and is used to fuel the steam generators. Crude oil produced from the Arroyo Grande field has API Gravities ranging from 14 to 22 degrees and 1.6 percent sulfur content, average for California crude oils which range from 0.8 to 2.0 percent sulfur.



Source: SAIC

STRATIGRAPHIC COLUMN FOR PRICE CANYON AREA

FIGURE 5.7-1



Source: ERCE 1991

MAJOR FAULT STRUCTURES NEAR PRICE CANYON
FIGURE 5.7-2

5.7.1.5 Soils

Soils found in the proposed Phase IV development area are predominantly comprised of weathering products of Pismo formation sandstones. As mapped by the U.S. Department of Agriculture Soil Conservation Service, soil units found within the region of influence are shown in Figure 5.7-3.

The dominant soil types, comprising greater than 70 percent of the expansion area, include loamy sands of the Arnold and Briones units. The Arnold Loamy Sand is typically developed on 5 to 15 percent slopes and is deeper than the Briones soils, averaging 59 inches. The Briones loamy Sand is developed on steeper slopes (15 to 50 percent) with an average depth of 32 inches. Loamy sands are typically 70 to 90 percent sand with varying percentages of silt and clay constituents making up the remaining 10 to 30 percent. The parent material for the Arnold and Briones loamy sands is derived from unconsolidated material weathered from the nearby siliceous marine sandstones of the Pismo formation. Due to the high quartz content of these weathered materials, the soils derived from them have not been able to develop a significant amount of clay content. This results in a loamy sand texture with a high permeability (i.e., low available water capacity), which leads to limited plant growth and minimal organic matter accumulation. Other dominant soil types found within the proposed development area include:

- CORRALITOS SAND - The Corralitos Sand, which occurs on slopes of 2 to 15 percent, is similar in character to the Arnold and Briones loamy sands. Due to the lack of clay content and organic matter in these soils, they lack cohesiveness, making them susceptible to wind and water erosion. The depth to rock can also be a limiting factor for construction in these soils. Formed in alluvium from sedimentary rocks, this soil has a coarse sand composition and occurs on steeper slopes in the project area;
- DIABLO AND CIBO CLAYS - These soils develop from weathered sandstone, shale, and mudstone materials. Both are relatively deep and relatively resistant to wind and water erosion. Limitations on construction in these soils are their high shrink-swell potential, low strength, and low permeability;
- GAVIOTA SANDY LOAM - Also formed from weathered sandstone, this unit occurs on the steepest slopes in the project area and has a high erosion potential. Construction is not likely to occur in these soils due to slope constraints (slopes ranging from 50 to 75 percent); and,
- PISMO LOAMY SAND - Similar to the Gaviota sandy loam, this soil is formed from weathered sandstone. Developed on slopes from 9 to 30 percent, this soil has a medium to high wind and water erosion hazard. Permeability of the Pismo soil is rapid.

5.7.1.6 Water Resources

Surface Water. Surface water in the project areas lies mainly in Pismo Creek. Pismo Creek occupies the floor of Price Canyon and flows south-southwest into the Pacific Ocean. The primary source of water for Pismo Creek comes from rainfall runoff from the San Luis Valley. The creek is augmented by several streams that originate from the surrounding hills including Tiber Creek, located near the south end of the site.

Groundwater. Groundwater flow in the region is generally controlled by the local topography and geology. Groundwater in the site area follows the topographic gradient to the southwest, and is probably bounded by the local hills to the northwest and southeast. The majority of stored potable groundwater at the site is likely to be found in the shallow alluvial deposits associated with Pismo Creek. Groundwater is produced from three water wells within the property. Groundwater at the Arroyo Grande oilfield overlies naturally occurring oil. The oil regularly migrates naturally upward from lower elevations toward the surface, frequently coming into contact with the groundwater.

PXP conducted groundwater sample collection and chemical analyses at the Project Site in June 2004. Groundwater samples were collected from two water supply wells located within the Project Site and operated by PXP. The groundwater samples were taken to a local analytical laboratory for chemical analyses for the following parameters: pH values, electrical conductivity, total dissolved solids (TDS), heavy metals, and total petroleum hydrocarbons (TPH). A review of the analytical results shows that there has been no significant increase in metals or TDS concentrations. TPH was not indicated above reporting limits in samples collected from the two wells. Electrical conductivity and pH values have increased slightly in each well but do not exceed state drinking water standards, known as Maximum Contaminant Levels (MCLs). Comparison of this data with historical data does not indicate a significant impact to groundwater from steam or wastewater injection activities at the oilfield.

5.7.2 Impact Analysis

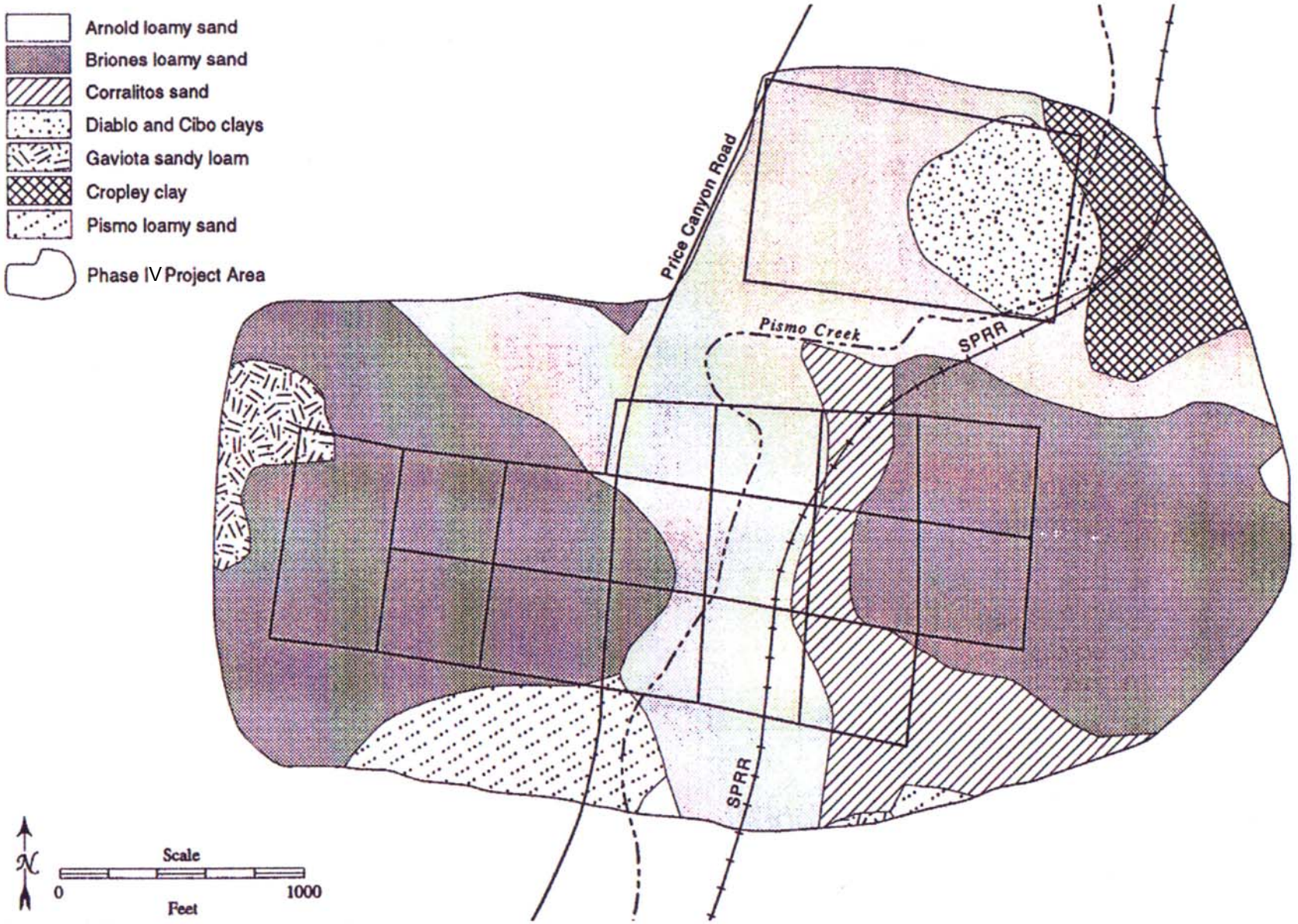
5.7.2.1 Thresholds of Significance

Based on Appendix G of the CEQA Guidelines (Governor's Office Of Planning and Research, 1999), an impact would be significant if any of the following conditions, or potential thereof, would result with implementation of the proposed project:

1. Result in a substantial, or potentially substantial, adverse change in the physical condition of the land;
2. Result in substantial soil erosion or the loss of topsoil;
3. 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; or
4. 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, Area Plan, or Zoning Ordinance) adopted for the purpose of avoiding or mitigating an environmental effect. For the purpose of this report, the following ordinances were used in this analysis:
    a. Land Use Ordinance 23.05.020 – Grading
    b. Land Use Ordinance 23.05.036 – Sedimentation and Erosion Control

5.7.2.2 Short-Term Impacts

Impact GEO-1: Construction of the proposed project may result in a substantial, or potentially substantial, adverse change in the physical condition of the land.



Source: SAIC

SOILS MAP
FIGURE 5.7-3

Discussion: Topography will be impacted by construction. The proposed project will utilize existing pads for 90% of new wells. The four new well pads, containing 10% of the new wells, will require 2.68 acres of ground disturbance. Minimal to moderate grading will be required on 18 existing pads cumulatively totaling about 4.22 acres. These landform changes would be dispersed over the entire 264-acre site. Therefore, the physical change to the land is considered adverse, but less than significant.

Impact Category: Class 3

Threshold of Significance: 1

Mitigation Measures: Since no significant impacts were identified, no mitigation is required.

Residual Impacts

None

Impact GEO-2: Construction of the proposed project could result in short-term increases in erosion and sedimentation resulting from earth-moving operations and exposed soils.

Discussion: Construction of the project will require land clearing operations to construct the proposed 4 new pads and for modification of the existing pads. During clearing operations, vegetation will be removed and soil will be exposed. Exposed sandstone-derived soil is vulnerable to erosion by rainfall runoff. Soil eroded from the project site could ultimately be deposited into Pismo Creek, which would increase turbidity and sedimentation.

Severe erosion could occur at the new well sites if any of the following occurred: improper road grading, uncontrolled surface runoff, barren fill slopes, overly steep fill slopes, filling adjacent to and in the creek channel, or lack of sediment catch basins. These practices would adversely affect Pismo Creek by increasing its sediment load.

Impact Category: Class 2

Thresholds of Significance: 2, 3, 4

Mitigation Measure GEO-2:

A. In compliance with the Land Use Ordinance, the applicant will prepare and implement a Sediment and Erosion Control Plan (SECP) for the proposed project. The SECP will include:

- Slope surface stabilization measures, such as temporary mulching, seeding, and other suitable stabilization measures to protect exposed erodible areas during construction, and installation of earthen or paved interceptors and diversion at the top of cut of fill slopes where there is a potential for erosive surface runoff;
- Erosion and sedimentation control devices, such as energy absorbing structures or devices, will be used, as necessary, to reduce the velocity of runoff water to prevent polluting sedimentation discharges;

- Installation of mechanical and/or vegetative final erosion control measures within 30 days after completion of grading;
- Confining land clearing and grading operations to the period between April 15 and October 15 to avoid the rainy season;
- Minimizing the land area disturbed and the period of exposure to the shortest feasible time;
- The SECP will be prepared in accordance with the Land Use Ordinance; and,
- Install long-term drainage devices at new/modified well pads, including headwalls, basins, culverts with down-drains and energy dissipating devices (riprap or diffusers).

B. In compliance with Section 23.05.020 – Grading, the applicant will prepare a grading plan for the project.

C. PXP will comply with the requirements under a general stormwater construction permit, which may be required by the RWQCB for the project. Such requirements may include~~Prior to construction, the applicant will develop a~~ preparation of ~~Storm~~a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP ~~will~~ would include provisions for the installation and maintenance of Best Management Practices to reduce the potential for erosion of disturbed soils at the Project site.

Residual Impacts

Implementation of this mitigation measure will reduce erosion and sedimentation impacts from construction activities to less than significant levels.

5.7.2.3 Long-Term Impacts

Impact GEO-3: Groundwater quality may be impacted by the project.

Discussion: Water from the three onsite wells is used only for landscaping and domestic uses; this would not change with the proposed project. All water used in steam injection comes from treating produced water. Surplus produced water not needed for steam is reinjected into the formation. Wastewater generated through the petroleum recovery process would be reinjected into wastewater injection wells. This wastewater reinjection could impact shallow groundwater supplies if the wastewater came in contact with groundwater used for domestic purposes. If this occurred, the water quality of down-gradient public and municipal water production wells could be degraded.

Impact Category: Class 2

Thresholds of Significance: 2, 3, 4

Mitigation Measure GEO-3: To minimize any impact on groundwater downgradient from the site, petroleum products should be removed from wastewater generated in the oil recovery process prior to reinjection. In addition, the water quality of the shallow aquifer zone beneath and downgradient from the site should be monitored regularly to detect any water quality impacts of project activities (e.g., steam or produced water injection). This can be accomplished by ~~semi-annual~~ monitoring of wells on the

property. The number of wells and well locations and frequency should be adequate to detect any impacts to water quality as determined by the ~~Regional Water Quality Control Board (RWQCB)~~appropriate jurisdictional authority. See also HAZ-1D.

~~Semi-annual reports shall be provided to RWQCB and the County of San Luis Obispo.~~

Copies of any report shall be provided promptly to the County.

Residual Impacts

Implementation of this mitigation measure will reduce impacts to less than significant levels.

5.7.2.4 Cumulative Impacts

Project Sites for the King South Ranch and Tentative Tract Map no.2388 both appear to drain to Pismo Creek. As such, construction of these two projects may cause construction-related turbidity and sedimentation of the Pismo Creek. Multiple projects near the creek could also increase erosion and increase creek sediment load, thus, resulting in a long-term impact for the area. If this situation were to occur, engineered systems, such as sediment catch basins, would be necessary to ensure that the increased sediment did not reduce the fresh water supply or the quality of habitat in Pismo Creek.

5.8 PALEONTOLOGICAL RESOURCES

This section provides an overview of Paleontology, an analysis of the impacts of the proposed project on paleontological resources, and measures to mitigate impacts. The proposed impacts and mitigation measures are based on the technical report included in Appendix F.

5.8.1 Paleontology

Paleontology is a scientific discipline involving the study of fossils. Despite the tremendous volume of sedimentary rock deposits preserved worldwide, and the enormous number of organisms that have lived through time, preservation of plant or animal remains as fossils is an extremely rare occurrence.

Each fossil is the rare biological record of a unique individual life. Fossils can provide information about the relationships of living and extinct organisms, their ancestry, their development and change through time, and their geographic distribution. Progressive morphologic changes observed in fossil lineages may provide critical information on the ways in which new species arise and adapt, or fail to adapt, to changing environmental circumstances.

Fossils can also serve as important guides to the ages of the rocks and sediments in which they are contained, and may prove useful in determining the temporal relationships of rock deposits from one area to another and the timing of geologic events. Time scales established by fossils provide chronological frameworks for geologic studies of all kinds.

5.8.2 Setting

The Pliocene-aged (5 to 2 million years before present) Pismo Formation is exposed throughout the project area. It is composed predominately of claystone, sandstone and siltstone with some conglomerate, diatomite and dolomitic sandstone (Hall 1973). The Pismo Formation reaches a maximum thickness of about 2500 feet in the Pismo syncline north of Shell Beach. The formation typically overlies the Monterey Formation or other older rocks unconformably. The Pismo Formation is partially time equivalent to the Santa Margarita Formation and to much of the Paso Robles Formation (Chipping 1987). The Pismo Formation is divided into five members from bottom to top stratigraphically: Edna, Miguelito, Gragg, Belleview, and Squire. Only the Edna Member is exposed in the project area.

The Edna Member consists of non-bituminous sandstone, bituminous sandstone, sandstone with the mineral dolomite, and conglomerate (Hall 1973). The Edna Member is best exposed in the project area (Arroyo Grande oil field) where it is about 1,500 feet thick. Bedding is locally variable. Some areas appear to have been submarine canyon fills with traces of cross bedding. Others areas have well bedded sandstones and shales that may represent the upper portion of submarine fans (Chipping 1987).

The following submembers have been defined by Hall (1973): (1) fine to coarse grained sandstone with a high quartz content, a low feldspar content and tar residues (Tmpe), (2) fine to coarse grained sandstone with a high quartz content, a low feldspar content and without tar residues ($Tmpe_2$), (3) fine grained gray dolomitic sandstone (Tmped), (4) conglomerate of well-rounded clasts of older local rocks (such as Monterey and Franciscan) that are poorly sorted and vary substantially in size (Tmpec), (5) massive medium to coarse grained pebbly sandstone ($Tmpe_3$), and (6) hard buff to gray tuffaceous (volcanic ash) sandstone, bituminous in some

areas ($Tmpe_4$). The invertebrate fossils known from the Edna Member are from the pebbly sandstone submember ($Tmpe_3$).

5.8.2.2 Previously Known Paleontological Localities

A search for paleontological records was completed at the Natural History Museum of Los Angeles County, the University of California at Berkeley Museum of Paleontology and in published materials. The project area and a 10-mile radius were searched for resources in the Pismo Formation.

The Natural History Museum of Los Angeles County had one locality within the 10-mile radius and the Museum of Paleontology had five. All of these fossil localities are in the Squire Member of the Pismo Formation or the Miguelito Member. The fossils include sea cows, sea hippos, sharks, fishes, and birds. The pebbly sandstone submember ($Tmpe_3$) of the Edna Member is known to have invertebrate fossils collected by the geologist who originally defined the members of the Pismo (Hall 1973).

5.8.2.3 Field Surveys

Cogstone Resource Management conducted paleontological reconnaissance surveys over ten days from July 17 to August 28, 2003. The survey was conducted on foot and both samples and representative fossils were collected. The survey covered all of the proposed Phase IV project area plus a large portion of the PXP lease holding in the Arroyo Grande Oilfield.

5.8.2.4 Fossil Localities within the PXP Lease Holdings

The field surveys of the PXP holdings within the Arroyo Grande Oilfield identified five fossil-bearing sites. Fossils found during these surveys were whales (mandible, bone fragments), seal/sea lion (fibula), shrimp (burrows), shark (tooth) and bony fish (tooth). The shark tooth may represent an unnamed species. Only one of these five sites is located within the Phase IV area, near well pad Maino 18J, where fossil whale and seal/sea lion bones were found.

The presence of both vertebrate and invertebrate fossils in the major submembers of the Edna Member of the Pismo Formation indicates that these entire geological units have the potential to contain scientifically important vertebrate and invertebrate fossils.

5.8.3 Impact Analysis

5.8.3.1 Thresholds of Significance

The following section analyzes the potential effects of the proposed project on paleontological resources in the project area.

The State CEQA Guidelines recommend the consideration of four questions when addressing the potential for significant impacts to cultural resources; however, only one is relevant to paleontological resources.

1. Would the project have any of the following effects:

   Directly or indirectly destroy a unique paleontological resource or unique geologic feature?

5.8.3.2 Short-Term Impacts

Impact PAL-1: Grading and excavation activities may uncover and adversely affect paleontological resources.

Discussion: Earth materials of the project site consist entirely of the fossil-bearing Edna member of the Pismo Formation. Construction activities, such as excavation and grading may destroy or alter fossils or the stratigraphic integrity of fossils, resulting in potentially significant impacts to paleontological resources.

Impact Category: Class 2

Evaluation Criteria: 1

Mitigation Measure: **PAL-1**: Prior to approval of the project, the applicant shall retain a qualified paleontologist to develop a paleontological mitigation monitoring plan for the review and approval by the County of San Luis Obispo that includes the following:

1. Prior to construction, the applicant will retain a qualified paleontologist to implement the mitigation plan and maintain professional standards of work.
2. A qualified monitor will perform full-time monitoring of all grading, enlargement of pads and all other open excavation work in native sediments. Monitoring will include inspection of exposed surfaces and microscopic examination of matrix. The monitor will have authority to divert grading away from exposed resources temporarily in order to recover the specimens and contextual data. PXP shall have the option to relocate work permanently without need to conduct further studies at that location. Relocation of work and any subsequent paleontological investigation would be done in consultation with the County of San Luis Obispo. Cooperation and assistance from on-site personnel will greatly assist timely resumption of work in the area of the discovery.
3. If the discovery meets the criteria for a fossil locality, formal locality documentation activities will be performed.
4. If microfossil localities are discovered, locality documentation activities shall include the collection of matrix material for processing. These activities may include use of equipment to excavate fossil-containing soils, and establishment of stockpiles away from the construction area. Testing of stockpiles shall consist of screen washing small samples (200 pounds) to determine if fossils are present. Productive tests shall result in screen washing of additional matrix from the stockpiles to a maximum of 6000 pounds per locality.
5. Fossils recovered shall be prepared, identified and cataloged, and donated to an accredited repository approved by the County of San Luis Obispo. Any resources determined not to meet significance criteria shall be offered to local schools for use in educational programs.
6. The principal investigator shall prepare monthly progress reports to be filed with the applicant and the County of San Luis Obispo. The principal investigator shall prepare a final report to be filed with the applicant and the County of San Luis Obispo. The report shall include a list of resources recovered, documentation of

each site/locality, interpretation of resources recovered and shall include all specialist's reports as appendices

5.8.3.3 Long-Term Impacts

The proposed project will not entail excavation of land during operations. Consequently, no impact to paleontological resources are anticipated as long as maintenance activities do not involve surface disturbance. If such disturbance were to occur, then mitigation measure PAL-1 would apply.

5.8.3.4 Residual Impacts

Drilling activities constitute an unavoidable adverse impact that cannot be mitigated, but is considered to be insignificant. This potential impact cannot be mitigated due to the fact that avoidance is not possible and there are no known feasible technical or logistic solutions to allow visual monitoring or fossil recovery at the depths drilling extends. Drilling represents an insignificant impact on potential paleontological resources due to the restricted amount of sediment affected.

5.8.3.5 Cumulative Impacts

Price Canyon appears to be paleontologically significant, such that construction of either the King South Ranch Project or the Tentative Map Tract no. 2388 may result in impacts to paleontological resources. It is possible that construction of either of this projects may result in incremental impacts to paleontological resources.

5.9 NOISE

This section addresses community noise impacts from project-related short-term and long-term noise sources. The noise analysis is based on information obtained from the *Traffic and Circulation Study for the Stocker Resources Arroyo Grande Oil Field Phase IV Project*, prepared by ATE (2001), the San Luis Obispo County Noise Element Technical Reference Document (1992), the County's Acoustical Design Manual (1992), and the Shell Western Development Plan Final Supplemental EIR (1994), prepared by SAIC.

5.9.1 Setting

5.9.1.1 Characteristics and Measurements of Noise

General Information on Noise. Noise is generally defined as unwanted or objectionable sound. Decibels and other technical terms are defined in Table 5.9-1. Noise levels are measured on a logarithmic scale because of physical characteristics of sound transmission and reception. Noise energy is typically reported in units of decibels (dB). Noise levels diminish (or attenuate) as distance to the source increases according to the inverse square rule, but the rate constant varies with type of sound source. Sound attenuation from point sources, such as industrial facilities, is about 6 dB per doubling of distance. Heavily traveled roads with few gaps in traffic behave as continuous line sources and attenuate at 3 dB per doubling of distance. Noise from more lightly traveled roads is attenuated at 4.5 dB per doubling of distance.

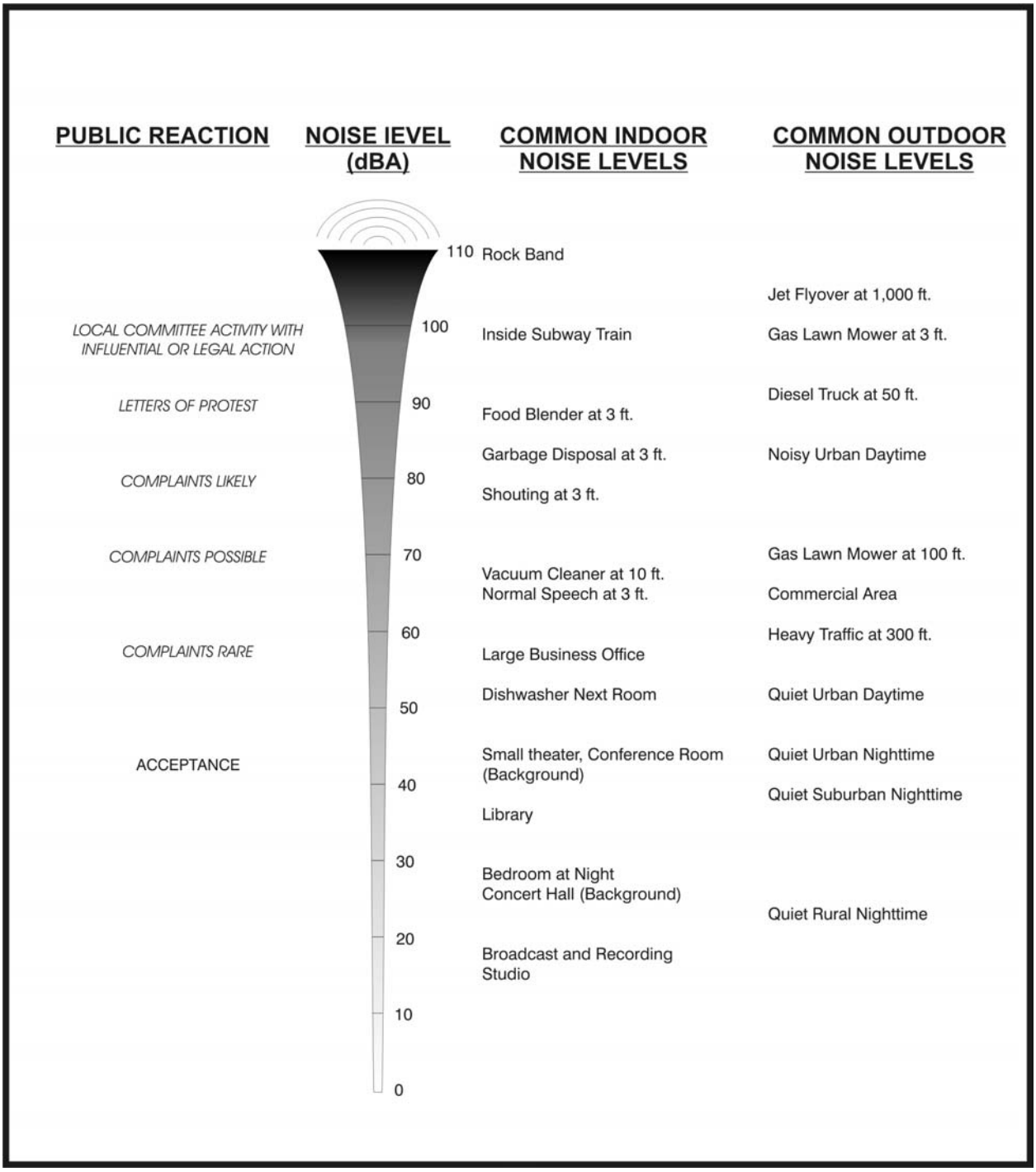
Community noise levels are measured in terms of the A-weighted decibel (dBA). A weighting is a frequency correction that correlates overall sound pressure levels with the frequency response of the human ear. Equivalent noise level (L_{eq}) is the average noise level on an energy basis for a specific time period. The duration of noise and the time of day at which it occurs are important factors in determining the impact on communities. Figure 5.9-1 provides a graphical representation of sound energy and potential adverse effects of common sounds. Noise is more disturbing at night and noise indices have been developed to account for the time of day and duration of noise generation. The Community Noise Equivalent (CNEL) and Day Night Average Level (DNL or L_{dn}) are such indices. These indices are time-weighted average values equal to the amount of acoustic energy equivalent to a time-varying sound over a 24-hour period. The CNEL index penalizes night-time noise (10 p.m. to 7 a.m.) by adding 5 dB to account for increased sensitivity of the community after dark. The L_{dn} index penalizes night-time noise the same as the CNEL index, but does not penalize evening noise.

Effects of Noise. People are subject to a multitude of sounds in the environment. Typical noise levels of indoor/outdoor environments and public response to these sounds are shown in Figure 5.9-1. Excessive noise cannot only be undesirable but may also cause physical and/or psychological damage. The amount of annoyance or damage caused by noise is dependent primarily upon three factors: the amount and nature of the noise, the amount of ambient noise present before the intruding noise, and the activity of the person working or living in the noise source area.

Table 5.9-1
Definitions of Acoustical Terms

Term	Definitions
Decibel, DB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the sample sound pressure to the standard sound pressure, which is 20 micropascals (20 micronewtons per square meter)
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure
A-Weighted Sound Level, dB	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear, and correlates well with subjective reactions to noise. All sound levels in this reports are A-weighted
Equivalent Noise Level, L_{eq}	The average A-weighted noise level during the measurement period
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 P.M. to 10:00 P.M. and after addition of 10 decibels to sound levels in the night between 10:00 P.M. and 7:00 A.M.
Day/Night Noise Level, L_{dn}	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 P.M. and 7:00 A.M.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, time of occurrence, tonal or information content, as well as the prevailing ambient noise level

Figure 5.9-1
Magnitude of Common Sounds



The difficulty in relating noise exposure to public health and welfare is one of the major obstacles in determining appropriate maximum noise levels. Although there has been some dispute in the scientific community regarding the detrimental effects of noise, a number of general conclusions have been reached:

- Noise of sufficient intensity can cause irreversible hearing damage;
- Noise can produce physiological changes in humans and animals;
- Noise can interfere with speech and other communication; and,
- Noise can be a major source of annoyance by disturbing sleep, rest, and relaxation.

5.9.1.2 Noise Sensitive Land Uses

The County's Noise Element has identified noise sensitive land uses as follows:

- Residential development, except temporary dwellings and residential accessory uses;
- Schools – preschool to secondary, college and university, specialized education and training;
- Health care services (hospitals);
- Nursing and personnel care;
- Churches;
- Public assembly and entertainment;
- Libraries and museums;
- Hotel and models;
- Bed and breakfast facilities;
- Outdoor sports and recreation; and,
- Offices

5.9.1.3 Existing Noise Environment

There are a number of potentially significant sources of community noise within San Luis Obispo County and its incorporated cities. These sources include traffic on state highways, major county roadways, and city streets, railroad operations, airport operations, military activities, and industrial facilities.

The site for the proposed project is an existing on-shore oil field located in Price Canyon about 3 miles north/northeast of Pismo Beach in San Luis Obispo County, California. The noise environment at the site is generated by existing oil field facilities. Noise sensitive receptors within the region of influence of the proposed project include scattered single-family residences located north of the proposed project near Corral de Piedra Road, houses to the northwest located along State Route 227, and homes to the south of the project site in Pismo Beach located along ridge tops with a view to the north. These residences are shown on Figure 5.9-2.

Existing Roadway Network. Regional access to the project site is provided by State Route 227, Price Canyon Road and Ormonde Road, as shown in Figure 5.2-1. The following text contains a brief description of the principal roadway segments which provide access to the study area.

State Route 227 – is a two-lane rural highway which extends between the Cities of Arroyo Grande on the southeast and San Luis Obispo on the northwest. The segment of State Route 227 south of Price Canyon Road is generally narrow with no shoulders and a curvilinear alignment. North of Price Canyon Road, the roadway becomes straighter and widens out to provide shoulders. Access to the project site from State Route 227 is provided via the Price Canyon Road connection. The SR 227/Price Canyon Road intersection is signalized.

Price Canyon Road – is a north-south improved two-lane County road which extends from the City of Pismo Beach on the south to State Route 227 on the north. Price Canyon Road bisects the Arroyo Grande Oil Field site and provides direct access to the site at the entrance located opposite Ormonde Road. The Price Canyon Road/Ormonde Road intersection is controlled by stop signs on Ormonde Road.

Ormonde Road – is an east-west two-lane County road which crosses the Arroyo Grande Oil Field site and connects to Price Canyon Road. This road provides access to the oil field located east of Price Canyon Road and extends easterly, eventually connecting with Noyes Road.

Existing Volumes. Existing ADT traffic volumes and LOS for the roadway network serving the study-area were obtained from a recent traffic and circulation study prepared by ATE. Figure 5.2-2 illustrates the planning area roadway network and the existing ADT volumes for the street segments included in the study. Existing average daily traffic (ADT) volumes for the street segments in the study area were obtained from machine counts completed in August 2001 by ATE and from Caltrans (Caltrans, 2001). Figure 5.2-2 illustrates the existing ADT volumes within the study area.

Ambient Noise Levels. Ambient noise levels were monitored at two representative locations shown in Figure 5.9-3. Noise measurement Location A is at the end of Longview Avenue in Pismo Beach, at a distance of over 2 miles from the project site. Two noise measurements were taken on October 13, 2003 during peak hours periods of 7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m. A Larson-Davis Model DSP 80 precision integrating sound level meter was used to determine baseline ambient noise. However, these noise measurements represent only the average noise level for this specific period of the measurement (2 hours). Table 5.9-2 identifies the location of the noise measurements and the short-term noise levels (Leq). Vehicular traffic on Price Canyon Road was audible at this location. The a.m. noise measurement at Location A included a train pass-by with horn along the Union Pacific Railroad tracks that are located adjacent to Price Canyon Road. The noise measurements at Location A are representative of the ambient noise levels experienced at residences in the portion of Pismo Beach south of the project site.

Two noise measurements were also taken at Location B on Corral de Piedra Road about 1,000 feet from Price Canyon Road. Two noise measurements were taken on October 14, 2003 during peak hours periods of 7:00 to 9:00 a.m. and 4:00 to 6:00 p.m. As noted above, these measurements represent only the average noise level for this specific period of the measurement (2 hours). Short-term noise levels (Leq) measured at this site is provided in Table 5.9-2. Vehicular traffic on Price Canyon Road, and to a lesser degree, on Highway 227, was audible from this location. Just prior to the noise measurement conducted in the morning, train noise was audible from a train passing (train sounded its horn) along the Union Pacific Railroad tracks that are located adjacent to Corral de Piedra Road and Price Canyon Road. Location B is representative of the noise environment of residences near Corral de Piedra Road (nos. 1, 2, 3, 4 and 14), and others in the project area due to similar proximity to Price Canyon Road, the Union Pacific Railroad tracks and existing oilfield operations.

Table 5.9-2
Ambient Noise Levels of the Project Site

Measurement Location	Dominant Noise Source	Distance (feet)	Time Period	Average Noise Level (dBA Leq)
End of Longview Drive in Pismo Beach (southwest of project site)	Traffic on Price Canyon Road and train on Union Pacific Railroad	Over 10,000 feet from project site	7:00 AM – 9:00 AM	52.5
End of Longview Drive in Pismo Beach (southwest of project site)	Traffic on Price Canyon Road and train on Union Pacific Railroad	Over 10,000 feet from project site	4:00 PM – 6:00 PM	43.3
Corral De Piedra Road (approximately 1,000 feet from Price Canyon Road)	Traffic on Price Canyon Road and train on Union Pacific Railroad	Approximately 2,400 feet from project site	7:00 AM – 9:00 AM	54.4
Corral De Piedra Road (approximately 1,000 feet from Price Canyon Road)	Traffic on Price Canyon Road and train on Union Pacific Railroad	Approximately 2,400 feet from project site	4:00 PM – 6:00 PM	56.3

Noise measurements were also taken of an existing well pumping unit in operation as well as the two existing steam generators east of Price Canyon Road on October 14, 2003. The noise of an oil well pumping unit with steam venting was measured at about 62 dBA L_{eq} at a distance of 50 feet. The noise of the two steam generators in operation at a distance of 50 feet was 65.3 dBA L_{eq}. Refer to Appendix G.

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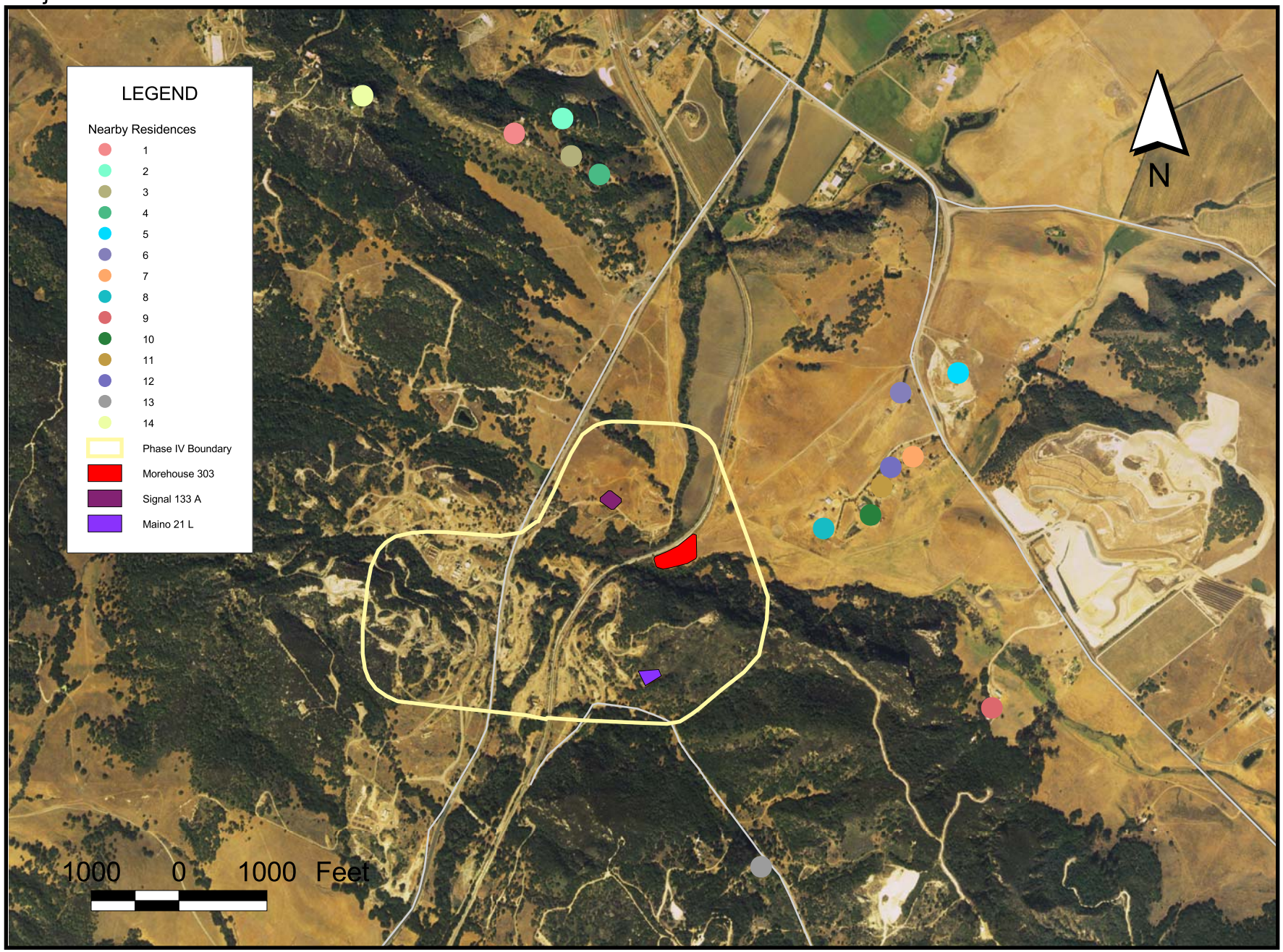

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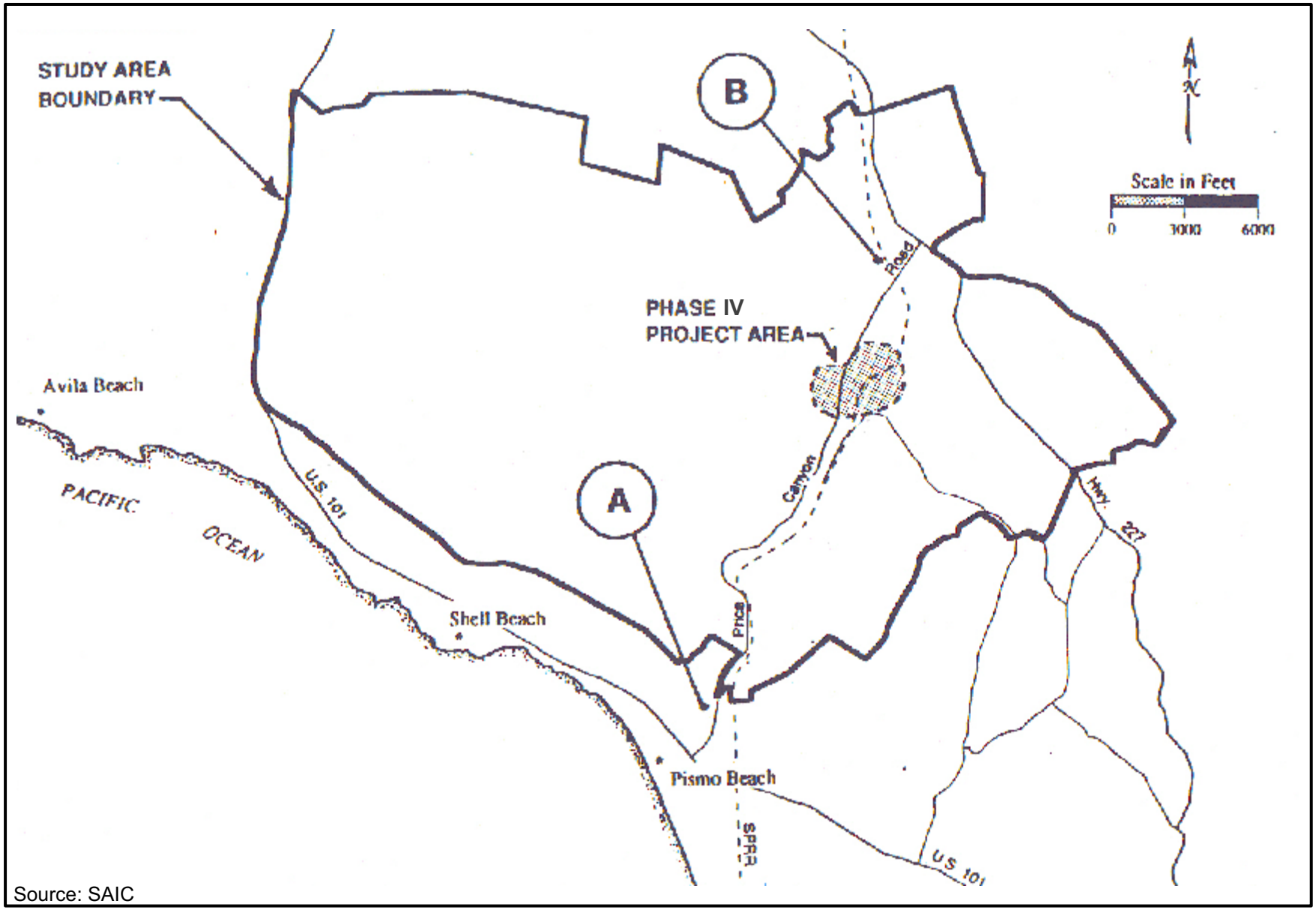

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NOISE MEASUREMENT LOCATIONS

FIGURE 5.9-3

Regulatory Setting. The Noise Element of the San Luis Obispo County General Plan provides a policy framework within which potential noise impacts may be addressed during project review and long-range planning. The San Luis Obispo Noise Element contains policies that are applicable to all development in the County, the most relevant of which are summarized below. Proposed activities that do not conform to these policies constitute a significant impact.

> **Policy 3.3.5.** "Noise created by new proposed stationary noise sources or existing stationary noise sources which undergo modifications that may increase noise levels shall be mitigated as follows and shall be the responsibility of the developer of the stationary noise:
>
> d) For new proposed resource extraction, manufacturing or processing noise sources or modifications to those sources which increase noise levels: where such noise source will expose existing noise-sensitive land uses (which are listed in the Land Use Element as allowable uses within their land use categories) to noise levels which exceed [a daytime L_{eq} of 50 dBA and nighttime L_{eq} of 45 dBA], best available control technologies shall be used to minimize noise levels. The noise levels shall in no case exceed [a daytime L_{eq} of 50 dBA and nighttime L_{eq} of 45 dBA]."
>
> **Policy 3.3.6**. "San Luis Obispo County shall consider implementing mitigation measures where existing noise levels produce significant noise impacts to noise sensitive land uses or where new development may result in cumulative increases of noise upon noise sensitive land uses."

5.9.2 Impact Analysis

Project impacts include both short-term impacts (construction-related) and long-term impacts (operation-related). Short-term impacts consist of noise generated by construction equipment, vehicles associated with grading, excavation/trenching, and erection of structures. Significant long-term impacts would result if land uses were introduced into areas with existing ambient noise levels in excess of adopted standards. These impacts would be significant if the project caused an exceedance of noise standards. This analysis includes an evaluation of the project's consistency with applicable plans and policies associated with noise issues. To date, no noise complaints have ever been recorded during construction operations.

5.9.2.1 Thresholds of Significance

The Noise Element of the General Plan and revisions to County Code establish maximum allowable noise levels from stationary noise sources. Noise levels shall not exceed an hourly average (L_{eq}) of 50 dBA during the daytime (7:00 a.m. to 10:00 p.m.) and 45 dBA at night (10:00 p.m. to 7:00 a.m.) at residential property lines. Maximum instantaneous noise levels shall not exceed 70 dBA during the daytime and 65 dBA at night. If noise generated by the proposed project were projected to exceed these levels at a residential property line, this would be considered a significant noise impact.

5.9.2.2 Short-term Impacts

ImpactNOS-1: Construction activities would result in short-term noise impacts to nearby residences.

Discussion: The proposed project site and the location of nearby residences are shown in Figure 5.9-2. Because of the rolling topography, project-related noise would be attenuated by intervening hills. However, all nearby residences have a line-of-sight to some portion of the project site. Noise levels generated by heavy equipment (e.g., pad grading activities) were estimated using a spreadsheet model based on a distance attenuation of 6 dB per doubling of distance and sound emission levels published in Bolt, Beranek and Newman (1971). Noise levels generated by well drilling were estimated based on an acoustical analysis of water well drilling conducted by Hersh Walker Acoustics (2003), which indicates an overall noise level of 75 dBA L_{eq} at 100 feet (includes generator, mud pump, drill works and draw-works).

The three new steam generators would consist of pre-fabricated equipment that would be transported to the project site for installation at the existing steam generator site. Construction associated with installation of the steam generators would be minimal and would not result in substantial noise impacts.

The Traffic and Circulation Study prepared for the project found that project-generated construction traffic would increase traffic volumes by only a small amount. As such, noise levels would not measurably or perceptibility change because of project-generated construction traffic.

Table 5.9-3 identifies estimated noise levels at each residence in the project vicinity, including simultaneous pad grading and well drilling. Table 5.9-3 indicates that construction activities at Residence 8 would exceed the 50 dBA L_{eq} daytime noise standard of the General Plan, and would exacerbate existing noise levels which already exceed the daytime noise standard. Construction activities; however, are exempt from this daytime standard. Drilling would exceed the 45 dBA L_{eq} nighttime standard at Residence 8. This exceedance of the General Plan noise standard is considered a significant impact.

Based on the estimated noise levels due to construction and noise attenuation, the maximum distance from a well pad in which activities would exceed noise standards at a residence due to construction activities is shown below:

- Drilling noise would reach 45 dBA L_{eq} (nighttime standard) at 2,060 feet;
- Drilling noise would reach 50 dBA L_{eq} (daytime standard) at 1,175 feet; and,
- Drilling and grading noise (combined) would reach 50 dBA L_{eq} (daytime standard) at 2,150 feet.

Figure 5.9-4 shows the existing pads and proposed new well pads where grading and drilling will occur. Whereas Figure 3-5 only shows these pads, it also shows existing well pads where only drilling will take place. Noise buffer distances were calculated for each residence based on the noise standards exceedance distances described above. As shown in Figure 5.9-4, drilling at well pads Signal 113D and Morehouse 303 would cause an exceedance of the nighttime noise standard of 45 dBA $L_{eq.}$

Table 5.9-3
Estimated Construction Noise at Sensitive Receptors

Residence no.	Nearest Well Pad	Distance to Nearest Well Pad (feet)	Existing Ambient Noise Level (dBA Leq)	Drilling Noise Level (dBA Leq)	Pad Grading Noise Level (dBA Leq)	Combined Construction Noise Level (dBA Leq)
1	Signal 113A	4250	54	39	43	44
2	Signal 113A	4280	54	39	43	44
3	Signal 113A	3850	54	40	44	45
4	Signal 113A	3650	54	40	44	45
5	Morehouse 303	3530	54	40	44	45
6	Morehouse 303	2850	54	42	46	47
7	Morehouse 303	2600	54	43	47	48
8	Morehouse 303	1400	54	48	53	54
9	Morehouse 303	3750	54	40	44	45
10	Morehouse 303	2000	54	45	49	50
11	Morehouse 303	2200	54	44	49	50
12	Morehouse 303	2350	54	44	48	49
13	Maino 21L	2450	54	44	48	49
14	Signal 113A	5300	54	37	41	49

Impact Category: Class 2

The authorization of future well and well pad construction associated with the Conditional Use Permit for this project should incorporate the following mitigation measures. Coordination between the County, the applicant, and a third-party monitor shall occur to ensure effective implementation of these measures.

Mitigation Measure NOS-1: Excluding drilling activities, no use of heavy equipment or heavy-duty trucks shall occur between 7 p.m. and 7 a.m.

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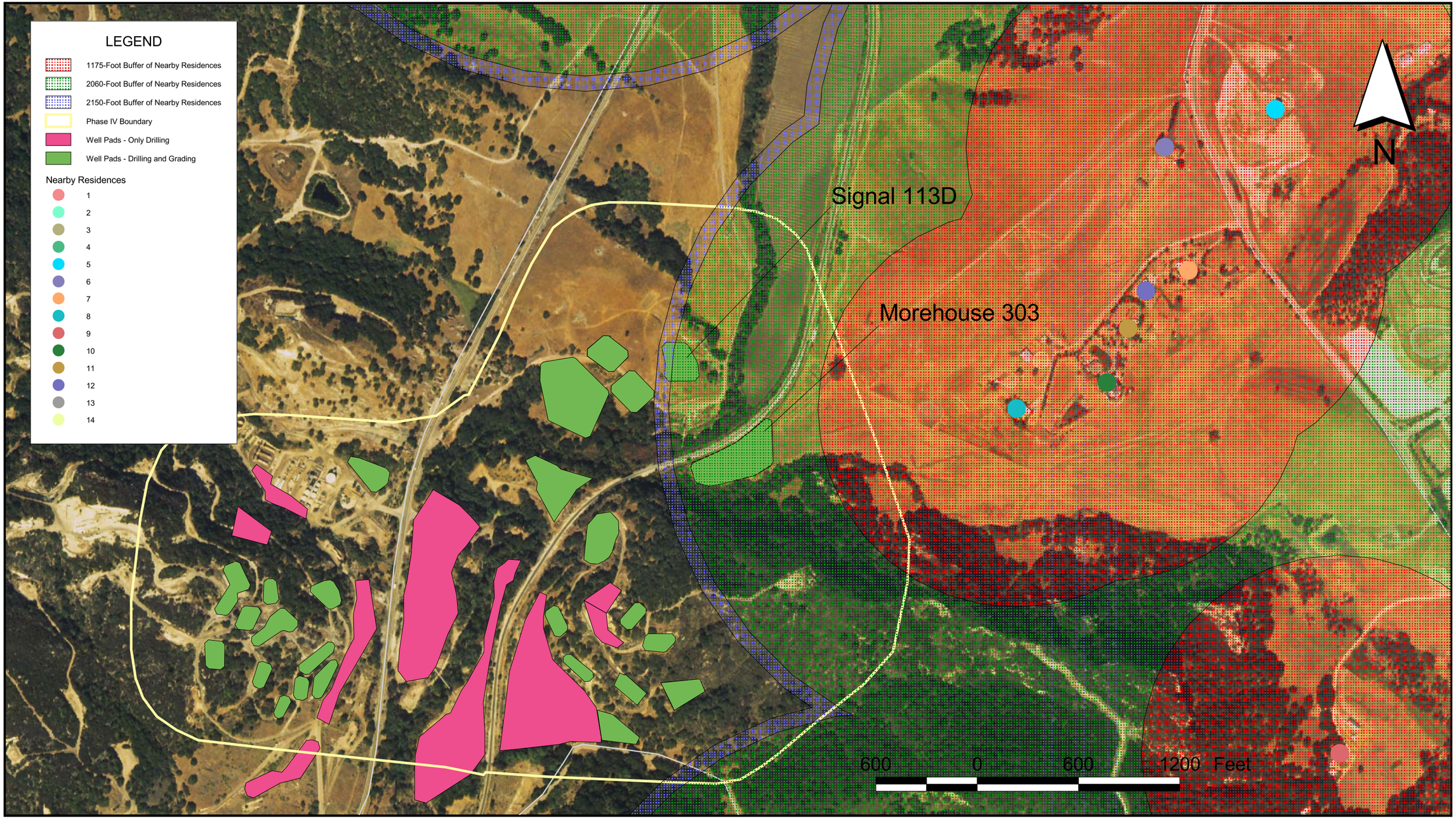

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Phase IV Development Plan EIR

NEARBY RESIDENCES & NOISE ATTENUATION BUFFERS
FIGURE 5.9-4

Mitigation Measure NOS-2: As shown in Figure 5.9-4, drilling activities at wells pads Signal 113D and Morehouse 303 would cause an exceedance of the 45 dBA L_{eq}. Therefore, noise attenuation blankets or other devices with a sound transmission class of 25 or greater shall be installed at a height exceeding the highest exhaust outlet and in a line-of-sight alingment so as to maximize noise ~~to completely enclose each drilling operations at~~attenuation at these two well pads sites. ~~The noise attenuation devices shall be at least 24 feet tall, and openings used for equipment access shall be offset to prevent line-of-sight loss of attenuation.~~

Mitigation Measure NOS-3: Equipment engine covers shall be in place and mufflers shall be in good condition.

Residual Impacts

Hersh Walker Acoustics (2003) indicates noise attenuation blankets would reduce drilling-related noise to 58 dBA Leq at 100 feet. Estimated project-related noise levels at Residence 8 would be reduced to 53 dBA Leq daytime and 31 dBA Leq nighttime (drilling only). Although the daytime noise level would be greater than the General Plan noise standard, construction-related noise levels would be less than existing conditions. Therefore, residual impacts are considered less than significant.

5.9.2.3 Long-term Impacts

Impact NOS-2: Operation of the steam generators may result in noise impacts to nearby residences.

Discussion: Based on noise measurements of existing steam generators at the project site, the addition of three new steam generators would result in a noise level of 29 dBA Leq at the nearest residence (Residence 8). This noise level is substantially below the 45 dBA Leq General Plan nighttime noise standard; therefore, noise from the new steam generators would not result in a significant noise impact.

Impact Category: Class 3

Mitigation Measure: Because existing noise levels would not measurably or perceptibly change at nearby residences due to operation of the steam generators, no mitigation is required.

Residual Impacts

None.

Impact NOS-3: Operation of the oil well pumping units may result in an increase in noise levels at nearby residences.

Discussion: The noise of an oil well pumping unit with steam venting is about 62 dBA Leq at a distance of about 50 feet. Without venting steam, the noise level is about 40 dBA at 100 feet (SAIC 1994). Noise generated by operation of pumping units for the 95 production wells dispersed over 264 acres would not measurably affect the noise environment at any of the nearby residences.

Impact Category: Class 3

Mitigation Measure: Because existing noise levels would not measurably or perceptibly change at the nearby residences due to operation of the 95 production wells, no mitigation is required.

Residual Impacts

None.

Impact NOS-4: The additional 25 truck trips/day to transport the produced oil from the proposed project may increase noise levels along Price Canyon Road.

Discussion: The objective of the Phase IV Project is to increase the amount of marketable gravity crude oil produced using a thermal (steam injection) process. Currently, approximately 1,800-1,900 BOPD (657,000-693,500 annually) are produced. The Phase IV project is anticipated to increase field oil production levels to 5,000 bbl/day, or 1,825,000 annually. Oil would be transported by tanker truck to the Conoco-Philips Battles pump station in Santa Maria. It is estimated that an additional 25 truck trips per day would be required to transport the new oil production. Additional truck trips may increase traffic noise levels on Price Canyon Road. These truck traffic-related noise increases are considered a less than significant impact due to excess ground attenuation associated with intervening topographic features, distance to Price Canyon Road and small increase in truck trips.

Impact Category: Class 3

Mitigation Measure: Because existing noise levels would not measurably or perceptibly change at the nearby residences due to the increased truck trips, no mitigation is required.

Residual Impacts

None.

Cumulative Impacts

The main cumulative noise impact associated with the construction of the proposed project and the other two projects planned to occur near the project area is the effect of all three projects on the acoustical quality of Price Canyon. The construction of the new well pads, modification to the existing ones, drilling of new wells, and construction of the steam generators combined would have adverse impacts to the acoustical quality of the canyon. However, the incremental contribution of the proposed project would be small, such that the cumulative noise impact is considered less than significant.

5.10 HAZARDS/RISK OF UPSET

This section addresses the potential for hazards/risk of upset associated with the proposed project, including the potential for on-site hazards from well drilling and workover operations, steam injection, oil spills, hydrogen sulfide and natural gases, hazardous materials storage, underground and aboveground storage tanks, and facility operations. The potential risks of upset impacts from the construction of the project are analyzed below and mitigation measures are included to reduce or eliminate those identified impacts.

5.10.1 Setting

For the proposed project, the environmental setting or baseline conditions reflect the baseline risks of upset associated with the existing oil and gas production facilities located at the project site. The hazards or risks of upset impacts from the proposed Phase IV operations are compared to the existing conditions associated with the operating oil field.

San Luis Obispo County has a limited number of oil and gas fields located on- and offshore. Oil production facilities currently exist at the Arroyo Grande oil field, the Guadalupe oil field (undergoing abandonment and cleanup), the Russell Ranch/Morales Canyon oil fields near Cuyama, and the Midway-Sunset oil field along the county's eastern border (County Energy Element, 1995).

Oil well drilling activities began at t~~T~~he Arroyo Grande oil field ~~was discovered in 1906 by the Associated Oil Company~~ in 1886 (DOGGR, 2004). By 1938, the Dolly Adams Oil Company had acquired control of the oil field and began new exploration of the field boundaries. The oil field was operated by various oil companies until the late 1990s when the leases were purchased by Stocker Resources from Shell Oil Company. The oil field currently has approximately 125 active wells. The crude oil-producing zone at the Arroyo Grande oil field is relatively shallow, at an average of depth of 750 feet. The produced oil has an oil gravity of 13 to 15 degrees API, which is considered heavy crude with high viscosity (DOGGR, 1992). The oil has a temperature of 90 to 100 degrees Fahrenheit when it is produced from the wells.

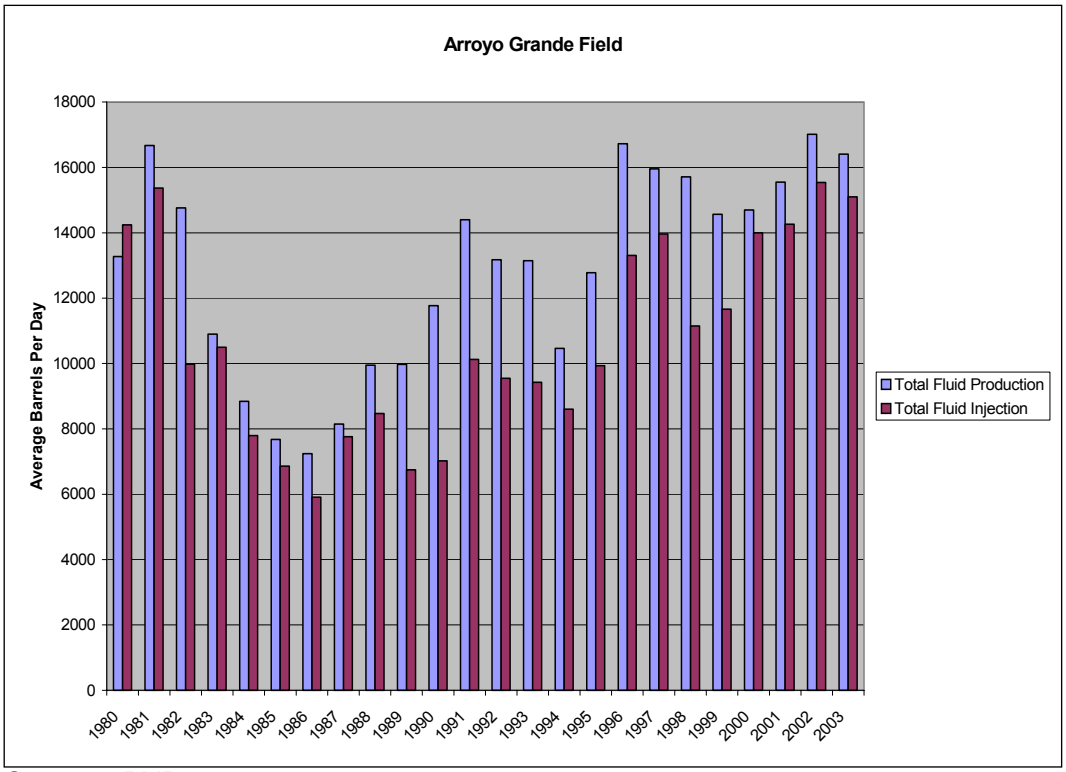
Crude oil produced from the field is currently trucked off-site to the Conoco-Phillips Battles pump station for shipment via pipeline to refineries. Current crude oil production is approximately 1,900 barrels of oil per day (BOPD) and current natural gas production is approximately 1.5 million standard cubic feet per day (MMSCFD). Produced gas is utilized on-site to fire steam generators or is sent to an on-site flare. ~~Produced gas contains approximately 5,000 parts per million of hydrogen sulfide. Hydrogen sulfide is removed from the produced gas at on-site processing facilities that utilize a patented adsorption process.~~

Hydrogen Sulfide Content. Produced gas contains a maximum of approximately 1.6% hydrogen sulfide. Hydrogen sulfide is removed from the produced gas at on-site processing facilities that utilizes a patented adsorption process. The concentration produced at the Arroyo Grande oil field varies depending on production and injection rates.

Injection Control. The California Division of Oil, Gas and Geothermal Resources (DOGGR) regulates underground injection of fluids in the state of California under an agreement with the U.S. Environmental Protection Agency (U.S. EPA). Under this program, DOGGR regulates underground injection through technical review of injection proposals and a review of various test results. Testing of injection wells includes mechanical integrity tests (MIT) to ensure that

well casing, tubing, and isolation devices (called packers) have integrity and that injected fluids are confined to the intended reservoir. DOGGR requires radiographic tracer tests of injection wells every two years and MITs every five years. DOGGR also requires monitoring of reservoir conditions to ensure that injected fluids will not impact usable groundwater. Underground injection includes water disposal wells, waterflood wells, steamflood wells, and cyclic steam injections. The RWQCB reviews and comments on DOGGR's project approval letters and guidelines on new and expanding project applications. Produced natural gas is also re-injected into the oil reservoir at the project site. In 2002, PXP injected a total of 328 million cubic feet (MCF) of gas, 2.1 million barrels of steam during steamflooding operations, and 3.3 million barrels of water in water disposal wells (DOGGR, 2002). Figure 5.10-1 below presents a graph of historical total fluid production (including oil, gas and water) and total fluid injection at the Arroyo Grande oil field. PXP is currently investigating alternative disposal/reuse methods for water produced from the Arroyo Grande oil field, including treatment and beneficial reuse.

Figure 5.10-1 – Total Fluid Production/Total Fluid Injection at the Arroyo Grande Oil Field.



Source: PXP.

Protection of Groundwater Resources. According to DOGGR, steam and water injection at the Arroyo Grande is designed to reach the oil reservoir, located at depths of between 400 to 1700 feet. Oil is known to occur at the surface within the oil field. For example, several active oil and gas seeps are present within the oil field. The top of the oil producing zone at the "Dollie" zone is approximately 300 to 400 feet below ground surface. As stated above, the DOGGR reviews proposed water or steam injection activities to determine whether injected fluids will be confined to the desired target zones and reviews required inspections and mechanical integrity tests to protect groundwater resources.

Spill History. Padre reviewed a log of reported oil spills at the ~~Division of Oil, Gas and Geothermal Resources (~~DOGGR~~)~~ District 3 office in Santa Maria, California. According to file information, seven reportable crude oil spills have occurred in the Arroyo Grande oil field in the last five years, approximately one per year. The spills have mostly been of small volume, less than five barrels (1 barrel = 42 gallons). There have been three reported oil spills caused by water injection which resulted in oil flowing from nearby oil wells. These spills were dated July 22, 2002, March 23, 2003, and September 3, 2003. The three oil spills occurred during water injection operations at a nearby well, Dollie No. 8, that caused oil to flow up nearby abandoned well casings and reach the ground surface. According to Ms. Pat Abel of the DOGGR, the DOGGR had previously been aware of the possibility of the effect of water injection on nearby idle wells and the operator (Plains) was actively monitoring the fluid levels in the known idle wells. However, during the three incidents described above, the oil surfaced from unknown open casings located away from the producing area of the oil field. The open casings were determined to have been abandoned oil wells dating back to the early 1900s. Ms. Abel stated that the operator responded promptly to the spills and the wells were re-abandoned to current standards. ~~Ms. Abel stated that, to the best of her knowledge, there have been no well blow-outs at the Arroyo Grande oil field since 1990 and no significant hydrogen sulfide releases at the project site.~~

Well Blow-outs. Oil wells drilled in California must be provided with blow-out prevention equipment (BOPE), in accordance with Title 14, California Code of Regulations Section 1722.5. BOPE equipment consists of valves and hydraulic rams that are closed to prevent the uncontrolled flow of fluids from a well bore to the surface. The DOGGR performs inspections of BOPE equipment to ensure proper installation and crew training. Ms. Abel stated that, to the best of her knowledge, there have been no well blow-outs at the Arroyo Grande oil field since 1990 and no significant hydrogen sulfide releases at the project site.

Project Vicinity. The Arroyo Grande oil field lies within Price Canyon area approximately 3 miles from the city of Pismo Beach. The nearest residences in the vicinity of the proposed project site are approximately 1,400 feet from the nearest proposed well pad and are located east and north of the project site. No schools, hospitals, or other special populations are located in the general vicinity of the project site. The Union Pacific railroad extends through the project site. Approximately four Amtrak passenger trains pass through the project site each day.

5.10.1.2 Regulatory Setting

The following section provides a brief description of some of the applicable state and federal regulations relating to the use, storage, and disposal of hazardous substances and petroleum.

Federal Laws/Regulations

Federal Water Pollution Control Act of 1972 (Clean Water Act). The Clean Water Act governs the control of water pollution in the United States. This Act includes the National Pollutant Discharge Elimination System (NPDES) program, which requires that permits be obtained for point discharges of wastewater. This Act also requires that storm water discharges be permitted, monitored, and controlled for public and private entities.

Resource Control and Recovery Act of 1974 (RCRA). RCRA was enacted as the first step in the regulation of the potential health and environmental problems associated with solid hazardous and non-hazardous waste disposal. RCRA and the formation of the U.S. Environmental Protection Agency (EPA) to implement the Act provide the framework for national hazardous waste management, including tracking hazardous wastes from point of origin to ultimate disposal.

Oil Pollution Act of 1990. The Oil Pollution Act (OPA) of 1990, together with the Oil Pollution Liability and Compensation Act of 1989, builds upon Section 311 of the Clean Water Act to create a single federal law providing cleanup authority, penalties, and liability for oil pollution. The law creates a single fund to pay for removal of and damages from oil pollution.

40 Code of Federal Regulations, Part 112. 40 CFR Part 112 requires the preparation and implementation of Spill Prevention, Control and Countermeasures (SPCC) Plans at facilities storing large quantities of crude oil. These regulations establish procedures, methods and equipment requirements to prevent the discharge of oil from onshore and offshore facilities into or upon the navigable waters of the United States.

California Laws/Regulations

Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code). The Porter-Cologne Act established a regulatory program to protect water quality and protect beneficial uses of the state's waters. The Porter-Cologne Act also established the State Water Resources Control Board and nine regional boards as the main state agencies responsible for water quality in the state. Discharges of wastes (including spills, and leaks) where they may impact the waters of the state are prohibited under the Porter-Cologne Act, including the discharge of hazardous wastes and petroleum products. The assessment and remediation of these wastes in San Luis Obispo County are regulated by the Central Coast Regional Water Quality Control Board (RWQCB). The RWQCB regulates discharges of waste to land through the waste discharge requirement process, including oil wastes in sumps or pits. Also, the RWQCB regulates on-site treatment of petroleum contaminated soils, tank bottom materials, and abrasive grits under Title 27 of the California Code of Regulations.

Public Resources Code (PRC), Section 31206 and California Code of Regulations, Title 14, Division 3, Oil and Gas. DOGGR is mandated to supervises the drilling, operation, maintenance, and abandonment of wells for the purpose of preventing: (1) damage to life, health, property, and natural resources; (2) damage to underground and surface waters suitable for irrigation or domestic use; (3) loss of oil, gas, or reservoir energy; and (4) damage to oil and gas deposits by infiltrating water and other causes. Furthermore, the PRC vests in the State Oil and Gas Supervisor the authority to regulate the manner of drilling, operation, maintenance, and abandonment of oil and gas wells so as to conserve, protect, and prevent waste of these resources, while at the same time increasing the ultimate recovery of oil and gas.

~~DOGGR has regulatory authority over the drilling, re-working and abandonment of oil wells, per Public Resources Code Section 3208.1.~~ DOGGR supervises oil field operations through a number of existing regulations contained in Title 14, CCR, Division 3. The DOGGR requires submittal of permit application for drilling of new wells, re-working and abandonment of wells and DOGGR inspectors conduct on-site inspections at critical phases of well construction, modification or abandonment. Blow-out prevention equipment (BOPE) is required to be

installed at each oil well being worked on. BOPE is designed to prevent the uncontrolled escape of oil, water or gas from the well in the event that high-pressure zones are encountered during drilling. The DOGGR also oversees the clean-up of oil spills, spill prevention and clean-up, and injection well activities.

Lempert-Keene-Seastrand Oil Spill Prevention and Response Act, (OSPRA). This act requires a State oil spill contingency plan to protect marine waters, and empowers a deputy director of the Department of Fish and Game to take steps to prevent, remove, abate, respond, contain and clean up oil spills. Notification of all oil spills that impact or threaten waters of the state is required to the Office of Emergency Services, who in turn notifies the response agencies. The Act creates the Oil Spill Prevention and Administration Fund and the Oil Spill Response Trust Fund.

California Health and Safety Code, Section 25500 et seq. This section of the California Health and Safety Code requires facilities storing hazardous materials or wastes in excess of threshold quantities to file a Hazardous Materials Business Plan with the local Certified Unified Program Agency (CUPA), in this case the County of San Luis Obispo Division of Environmental Health. Business plans are required to contain specific site information, a site map, an inventory of hazardous materials and wastes stored on-site, an emergency response plan, an employee evacuation plan, and documentation of training for workers.

~~**Uniform** **California** **Fire Code**~~. The ~~Uniform~~ 2001 California Fire Code has been adopted by CDF/County Fire, which is the fire agency with jurisdiction over the project site. The ~~Uniform~~ California Fire Code contains minimum standards for many aspects of fire prevention and suppression activities. These standards include provisions for access, water supply, fire protection systems and fire resistant building materials. The ~~Uniform~~ California Fire Code also includes provisions for required setbacks for oil wells from buildings, storage tanks, and streets and railways.

County of San Luis Obispo Regulations

Energy Element. In 1995, the County of San Luis Obispo adopted the Energy Element as part of the County's General Plan. The Energy Element contains a goal of protecting public health, safety and environment, and several policies that promote that state goal. These policies are summarized below:

> Policy 52. Proposed new or major additions to fossil fuel facilities must provide sufficient buffer zone from existing or proposed human population, with special consideration given to those who cannot be quickly evacuated to safety, such as the disabled and elderly. To establish a buffer zone, a comprehensive risk analysis should be completed.
>
> Policy 56. Encourage existing and proposed facilities to focus on measures and procedures that prevent oil, gas, and other toxic releases into the environment. This policy is to ensure that facilities: (1) take measures to prevent releases and spills, (2) prepare for responding to a spill or release, and 3) provide for the protection of sensitive resources. A review of a facilities spill response plan, or reports from other agencies, should be completed to monitor compliance.
>
> Policy 64. State and federally approved oil spill contingency and countermeasure plans for proposed facilities shall be submitted to the county prior to the start up of operations.

These plans shall at a minimum demonstrate that adequate containment exists to contain 110% of each tank's contents, unless otherwise required by applicable state and federal regulations.

Policy 64. Guideline 64.1. To reduce the possibility of injury to the public, facility employees, or the environment, the applicant shall submit an emergency response plan which details response procedures for incidents that may affect human health and safety or the environment. The plan shall be based on the results of the comprehensive risk analysis. In the case of a facility modification, the existing response plan shall be evaluated by the safety review committee and revisions made as recommended.

Policy 64. Guideline 64.2. Major new facilities shall be sited within five minutes response time of an adequately staffed and equipped fire/emergency response station. A fire protection system and response plan shall be approved by the governing authority.

Policy 65. In the event of a petroleum or hydrocarbon release, implement the following policies:

- Emergency response and initial clean up of the spill site shall be completed as soon as possible. An emergency permit shall be granted as appropriate. A state of emergency as defined in the general plan must exist for a permit to be granted.
- Environmental impacts caused by response and clean up activities shall be minimized. Environmental monitors(s) shall be onsite to reduce possible impacts.
- A post-spill environmental assessment of the site shall be performed to evaluate and quantify the damage to resources.
- Remediation and restoration of the site to pre-spill conditions shall be completed.
- If the site cannot be restored to its pre-spill condition, the responsible party shall contribute to an environmental enhancement fund to be used for on or off-site mitigation projects.

A detailed discussion of the project's consistency with adopted county plans is presented in Section 4.0.

5.10.2 Impact Analysis

5.10.2.1 Thresholds of Significance

The County of San Luis Obispo has not adopted specific risk criteria for oil and gas facilities. For the purposes of this EIR, a significant hazards/risk of upset impact is assumed to occur if the Proposed Project results in any of the following conditions (per CEQA Guidelines, Appendix G):

1. Create a significant hazard to the public or the environment through the routine transport, use or disposal of hazardous materials;
2. Create a significant hazard to the public or the environment through the reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;

3. Emit hazardous emissions or handle hazardous or acutely hazardous materials within one-quarter mile of an existing or proposed school;
4. 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 create a significant hazard to the public or the environment;
5. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles or a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area;
6. For a project within the vicinity of a private airstrip, would the project result in the safety hazard for people residing or working in the project area.
7. Impair the implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan; or
8. Expose people or structures to a significant risk or loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

5.10.2.2 Short-Term Impacts

Impact HAZ-1: Well drilling, workover, re-drilling, or steam injection activities could experience a well blow-out resulting in the uncontrolled release of fluids and possibly explosion and fire.

Discussion: According to DOGGR, no well blow-outs have occurred at the project site since 1990. However, well blow-outs are always a concern in an oil field, and the potential is somewhat higher in fields undergoing steam injection. DOGGR regulations require blow-out prevention equipment to be in-place and operational prior to commencement of any drilling or workovers at oil well locations. DOGGR inspects BOPE at each oil well prior to initial drilling or subsequent well modifications or maintenance activities. Furthermore, as shown in Figure 10-1, the oilfield is operated in a negative balance, whereby the total fluid injected is less than the total fluid produced, thereby reducing the internal reservoir pressure. As such, ~~T~~the potential for well blow-outs at the project site is considered a ~~less than~~ significant but mitigable impact.

Impact Category: Class ~~3~~2

Evaluation Criteria: 2

Mitigation Measures: ~~No significant impact was identified; therefore, no mitigation is required.~~HAZ -1A - Prior to initiation of well drilling activities, the applicant shall complete table-top and field emergency training with CDF/County Fire, County Hazardous Materials Team, and DOGGR. PXP shall provide CDF/County fire with actual costs to cover the expenses of the training exercises, including overtime and equipment replacement. The amount of this training shall not exceed $8,000 every two years of $4,000 annually.

HAZ 1B – The applicant will complete annual inspections with the CDF/County Fire Department to ensure compliance with the County adopted California Fire Code, currently the 2001 version.

HAZ 1C – PXP shall submit a Notice of Intent and obtain written approval from the State Oil and Gas Supervisor prior to drilling, reworking, injecting into, plugging, or abandoning any well. The Notice of Intent will be reviewed by DOGGR on an engineering and geological basis. PXP will be required to submit detailed geological and engineering information to support the project. Approval will be subject to protection of the public and the environment by using adequate blowout prevention equipment. DOGGR will monitor potential risks from critical wells (wells located in close proximity to Price Canyon Road and the UPRR railroad) as part of their well application review process.

HAZ 1D – Prior to approval, PXP shall develop a contingency plan for proper wastewater handling in the event that adequate wastewater injection capacity cannot be developed.

Residual Impacts: Residual impacts are anticipated to be less than significant.

5.10.2.3 Long-Term Impacts

Impact HAZ-2: An oil spill could occur at abandoned wells or other surface locations at the project site during water injection or steam injection activities.

Discussion: Due to the shallow occurrence of oil at the Project Site, water or steam injection operations at the oil field could result in the migration of oil to the surface via unknown abandoned oil wells or other migration pathways, such as surface exposures of oil sands.

Impact Category: Class 2

Evaluation Criteria: 2

Mitigation Measure HAZ-2A: During water injection and steaming operations, PXP shall make daily inspections of drainages, known nearby well sites, and surface ~~exposures of oil sands~~ seeps within the 2,000 feet of the injection locations to identify oil release at the ground surface. In the event of a spill release, the applicant shall immediately notify the appropriate regulatory agencies of the discovery and implement spill response, mitigation, and clean-up activities. As required by DOGGR, abandoned oil wells identified to have the potential to release oil to the environment shall be re-abandoned to current DOGGR standards.

HAZ-2B – The applicant shall store on-site cleanup materials including diking materials and absorbent material such as pads and booms that will be accessible to the fire department in case of emergency. The applicant shall provide CDF/County Fire with two gas detectors for the closest responding fire engines or HAZ MAT Unit who would respond to an incident at the oil fields or along the travel routes to the refinery. These detectors shall be capable of detecting combustible levels and Hydrogen Sulfide (H2S) levels and will be the equivalent of the iTX Multi-Gas Monitor.

Residual Impacts: With implementation of the mitigation measure presented above, residual impacts are anticipated to be less than significant.

Impact HAZ-3: The proposed project could generate risks to the public safety and the environment by exposure to crude oil spills, ~~and~~ subsequent fires during transportation, and wildfires due to operations.

Discussion: Implementation of the proposed project would increase production from a current 1,900 BOPD to as much as 5,000 BOPD. The produced oil would be transported via tanker truck to the Battles pump station in Santa Maria for transport via pipeline to refineries. This will result in approximately 25 additional truck trips per day leaving the facility. The baseline risk for tanker truck accidents occurring is 1.5×10^{-6} per vehicle-mile (ADL, 2002). An additional 25 tanker trucks traveling 60 miles each trip per day would not significantly increase the risk of a tanker truck accident that results in a release of petroleum. Intersection visibilities are adequate at the exit from the project site at Price Canyon Road. Refer to Section 5.2 - Traffic and Circulation for more information on traffic impacts. Additionally, the CDF/County Fire department airport station is located approximately six miles from the project site. Response times from the airport fire station are estimated to be 10 minutes. ~~This is considered a less than significant impact.~~

Impact Category: Class ~~3~~2

Evaluation Criteria: 1

Mitigation Measure: ~~No significant impact were identified, there no mitigation is required.~~HAZ-3A – On an annual basis, the applicant shall provide CDF/County Fire and County Environmental Health with their emergency response plan for review and approval. The plan will include procedures and annual training exercises with CDF/County Fire, the County Hazardous Materials Team, and other appropriate agencies on handling a petroleum or hydrogen sulfide emergency at the Project Site. See Mitigation Measure HAZ-1A.

HAZ-3B – The applicant shall produce CDF/County Fire a Fire Hydrant System plan for approval prior to construction. This plan shall be implemented before construction commences.

HAZ-3C – PXP shall submit a vegetation management plan to CDF/County Fire for approval prior to issuance of construction permits. This will identify measures to minimize the risk of wildfires due to operation of existing and proposed new pipelines and powerlines. It will also make recommendations for protection of such facilities from a wildlife.

Residual Impacts: No significant residual impacts were identified.

Impact HAZ-4: An oil spill could possibly enter Pismo Creek.

Discussion: There is the possibility of an oil spill entering Pismo Creek from an on-site pipeline, storage tank, or other processing equipment. Depending on the amount of oil spilled, this could be a significant impact. However, the heavy, high-viscosity crude oil will spread slowly as it cools to ambient temperatures.

Impact Category: Class 2

Evaluation Criteria: 2, 3, 4

Mitigation Measure HAZ-4: Prior to commencement of oil production from Phase IV wells, PXP's Spill Prevention Control and Countermeasure Plan (SPCC) for the Arroyo Grande oil field should be updated to address the increased production and spill

scenarios. The SPCC update should include measures to both reduce the likelihood of an oil spill entering the creek through engineered containment devices and regular monitoring. Also refer to mitigation measures HAZ 2A and HAZ-2B. Furthermore, approval of the Notice of Intent by DOGGR will be subject to proper oil spill H_2S contingency plans and protecting all subsurface hydrocarbons and fresh waters by using approved drilling and cementing techniques.

Residual Impacts

Implementation of this mitigation measure will reduce impacts to less than significant levels.

Impact HAZ-5: An accidental release of gas containing hydrogen sulfide could pose a risk to on-site workers or adjacent populations.

Discussion: Hydrogen sulfide is present in produced fluids at the project site; however, the volume of hydrogen sulfide contained within any one location at the project site is relatively small as compared to large gas processing facilities such as the Lompoc Oil and Gas Plant or Las Flores Canyon in Santa Barbara County. Furthermore, the oilfield is operated with a negative pressure balance (see discussion above), such that the risk of a hydrogen sulfide release is reduced due to the lower operating pressure. Nevertheless, PXP has prepared and implemented a hydrogen sulfide training and safety plan for workers at the oil field. The applicant also has an Emergency Response Action Plan in place to be implemented in the event of a hydrogen sulfide release. Additionally, DOGGR conducts regular site inspections during specific activities to ensure proper safeguards are in place to prevent a release of gas. ~~Therefore, the risk of a significant release of hydrogen sulfide is considered a less than significant impact.~~

Impact Category: Class ~~3~~2

Evaluation Criteria: 1, 2

Mitigation Measure: ~~No significant impact were identified, there no mitigation is required.~~ Refer to Measures HAZ-2 and HAZ-3A.

Remaining Issue Area Discussion. The project site does not lie within one-quarter mile of a school. The project site does not appear on the list of hazardous waste sites compiled pursuant to Government Code Section 65962.5.

The project does not lie within the jurisdiction of an airport land use plan or within two miles or a public airport or public use airport, or within the vicinity of a private airstrip. The project site is not in close proximity to public or private airports, therefore no significant impacts from aircraft hazards are anticipated.

The project will not impair the implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. The project site will provide adequate emergency access and evacuation of workers in the events of emergencies.

The project site will not expose people or structures to a significant risk or loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

5.10.2.4 Cumulative Impacts

Cumulative impacts due to hazards/risk of upset could occur if proposed residences are located in close proximity to existing or proposed wells sites. However, proposed well sites are located at least 1,400 feet from the property boundaries. Additionally, ~~Uniform~~ California Fire Code regulations would prohibit construction of a dwelling in close proximity to operating oil wells. Therefore, no significant increased cumulative risks of upset impacts are anticipated.

CHAPTER 6.0
PROJECT ALTERNATIVES

The California Environmental Quality Act (CEQA) requires that EIRs review a range of alternatives that might reduce or avoid the significant impacts of a Proposed Project. This chapter reviews the range of alternatives that were considered in developing this EIR. Some alternatives were rejected from analysis because they did not reduce environmental effects, were infeasible, or did not meet the project goals.

Alternatives are considered in an EIR to assist the public and decision-makers in considering the environmental consequences of a Proposed Project. The purpose of the alternatives analysis is to consider reasonable feasible options to reduce or avoid the significant impact of a Proposed Project. The range of alternatives to the Proposed Project is governed by the rule of reason. CEQA Guidelines, Section 15126.6(a) states: "An EIR shall describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives." Further, Section 15126.6(b) states: "…the discussion of alternatives shall focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly.

The CEQA Guidelines Section 15126.6(c) states that "The range of potential alternatives to the project shall include those that could feasibly accomplish most of the basic objectives of the Proposed Project and could avoid or substantially lessen one or more of the significant effects. The EIR should briefly describe the rationale for selecting the alternatives to be discussed. The EIR should also identify any alternatives that were considered by the lead agency but were rejected as infeasible during the scoping process and briefly explain the reasons underlying the lead agency's determination." Factors to be used to discard alternatives are "(i) failure to meet most of the basic project objectives, (ii) infeasibility, or (iii) inability to avoid significant environmental impacts.

The "feasibility" of an alternative is evaluated by taking into account various factors, such as site suitability, economic viability, availability of infrastructure, consistency with government-approved plans and regulatory limitations, jurisdictional boundaries, and by assessing whether the alternative, if it is at another location, is on land that can be reasonably acquired. The range of alternatives that must be studied in detail in an EIR includes a reasonable range of options that are both "feasible" and result in less adverse environmental impacts than the Proposed Project.

6.1 ALTERNATIVES DELETED FROM FURTHER CONSIDERATION

Several alternatives were considered in lieu of the proposed project, but were deleted from further consideration because they did not appear to be realistic options. They are summarized briefly below:

6.1.1 Alternate Locations of Oil Sources

This alternative considered alternative sites for oil, but was rejected because alternative sites were not available to the applicant. As alternative sites have not been considered for the Phase IV project, this alternative is not applicable.

6.1.2 Alternative Oil Recovery Methods

The 1981 EIR considered two alternative oil recovery methods: tar sand surface mining (i.e., open pit mining of the oil-laden sandstone) and conventional and/or chemical oil recovery processes. The tar sands method was rejected in the original EIR, Arroyo Grande Thermal Project, Phase II Operations (ERCO 1981), for three reasons: (1) its impact would be greater than the proposed thermal injection process, (2) oil recovery below the surface would not be possible until after surface mining, and in some areas of the site, would not be possible due to surface alteration; and (3) the County considered this alternative inappropriate at that time. The conventional oil recovery option was rejected because all oil on the site that could be recovered this way has already be recovered. Chemical injection as a tertiary recovery method was rejected because it had higher environmental impacts than the proposed thermal injection process. This alternative, thus, does not appear to offer any potential reduction in significant impacts.

6.2 ALTERNATIVES ANALYZED

Five alternatives were analyzed in lieu of the proposed projects. These include: (1) No Action Alternative, (2) Reduced Project Alternative, (3) Reduced Disturbance Alternative, (4) Alternate Energy Source Alternative, and (5) Fully Mitigated Alternative. Table 6-1 provides a qualitative comparison of the four alternatives with respect to each issue area analyzed in Chapter 5.0.

6.2.1 Alternative 1 – No Action Alternative

The no action alternative would not involve any new construction, nor introduce any new significant environmental effects. It would allow the existing operations to continue as it is currently configured but would not allow any expansion of the Arroyo Grande Field. It would avoid all of the impacts of the proposed Phase IV expansion; however, the No Action alternative would not achieve the project objectives.

6.2.1.1 Land Use

Under this alternative, there would be no expansion of existing operations and oil production would remain at current levels. Current operations are consistent with the San Luis Obispo General Plan, San Luis Obsipo Land Use Ordinance, and the San Luis Obispo Energy Element. There would be less impacts to several resources, including the aesthetics, air quality, biological, cultural, and paleontological associated with this alternative. As such, this alternative would be more consistent with existing plan and policies.

Table 6-1. Qualitative Comparison of Project Alternatives

Alternative	Issue Area									
	Land Use	Traffic & Circulation	Aesthetics	Air Quality	Biological Resources	Cultural Resources	Geology & Soils	Paleontological Resources	Noise	Hazards
Proposed Project	2	2	2	1	2	2	2	2	1	1
1 – No Action	6	6	6	6	6	6	6	6	6	6
2 – Reduced Project	4	4	3	3	3	3	3	3	2	4
3 – Reduced Disturbance	3	3	4	2	4	4	4	4	3	3
4 – Alternate Energy Source	1	1	1	4	1	1	1	1	4	2
5- Fully Mitigated	5	5	5	5	5	5	5	5	5	5

Note: 1 = Greatest Impact, 5 = Lowest Impact

6.2.1.2 Traffic and Circulation

Existing average day traffic (ADT) volumes and level of service (LOS) for the roadway network serving the study-area were obtained from the recent traffic and circulation study prepared by ATE. Figure 5.2-2 illustrates the planning area roadway network and the existing ADT volumes for the street segments included in the study. As shown in Table 5.2-1, the study area intersections currently operate in the LOS A-C range, which is considered a good service level. There would be no construction-related traffic with this alternatives. As such, the impacts to traffic and circulation would be less under this alternative as the proposed project.

6.2.1.3 Aesthetics

Aspects of current operations are visible to some degree to motorists traveling along Price Canyon Road. This includes partial views to the existing steam generators, well pumper units, and ancillary facilities, such as flowlines. Under this alternative, there would no construction of new well pads or modification to existing ones. Furthermore, there would not be any drilling of new wells. As such, the impacts to aesthetics would be less under this alternative. Existing measures adopted as part of the 1994 EIR would still apply.

6.2.1.4. Air Quality

Impacts to air quality will be less under this alternative, since there would be no construction of new well pads or modification of existing ones. Furthermore, there would be no drilling of new wells or expansion of operations. As such, emissions would not increase with this alternative.

6.2.1.5 Biological Resources

Under this alternative, there would be no construction of new well pads or modification to existing ones. Furthermore, there would not be any drilling of new wells. It would allow the existing project to continue as it is currently configured but would not allow any expansion. Because this alternative would result in no additional development, impacts on existing biological resources would be substantially less under this alternative. This would include elimination of impacts to intact oak woodland, coyote brush scrub, and annual grassland habitat areas and known populations of special-status plant and animal species. However, existing mitigation measures adopted as part of the 1994 EIR would still apply to reduce impacts of existing operations on biological resources. Residual impacts to biological resources after implementing these mitigation measures would be less than the proposed project.

6.2.1.6 Cultural Resources

Under this alternative, there would be no construction of new well pads or modification to existing ones. Furthermore, there would not be any drilling of new wells. Maintenance activities involving excavation may result in impacts to cultural resources. Mitigation measures to reduce impacts would be similar as the proposed project.

6.2.1.7 Geology and Soils

Under this alternative, there would no construction of new well pads or modification to existing ones. Furthermore, there would not be any drilling of new wells. Impacts to geology and soils under this alternative would be less than the proposed project, since there would no construction activities. There would be fewer long-term impacts associated with exposed soils, since there would no removal of mature coast live oaks and manzanita. Potential impacts to groundwater quality due to reinjection of wastewater would be less, since the amount of wastewater produced would be less than the proposed project.

6.2.1.8 Paleontological Resources

Under this alternative, there would no construction of new well pads or modification to existing ones. Furthermore, there would not be any drilling of new wells. As such, impacts to paleontological resources would be less. Maintenance activities involving excavation may result in impacts to paleontological resources. Mitigation measures to reduce impacts would be similar as the proposed project.

6.2.1.9 Noise

Under this alternative, there would no construction of new well pads or modification to existing ones. Furthermore, there would not be any drilling of new wells. Since there would be no new construction and no new drilling, noise impacts would be less under this alternative than the proposed project.

6.2.1.10 Hazards/Risk of Upset

Under this alternative, there would no construction of new well pads or modification to existing ones. Furthermore, there would not be any drilling of new wells. Since there would be no new construction under this alternative, there would be no potential for hazards/risk of upset impacts resulting from the construction of additional oil wells. The potential long-term potential hazards/risk of upset impacts would be less under this alternative, since the number of operating oil wells and oil production would not increase.

6.2.2 Alternative 2 - Reduced Project Alternative

Alternative 2 would be a “reduced project” alternative involving only 45 producer wells, 10 injector wells, and only 1 steam generator. This alternative assumes that the 45 wells would be distributed over the Phase IV area in roughly the same way that the 95 producer wells and 30 injector wells would be, and the one steam generator would be located at one of the two proposed steam generator sites.

6.2.2.1 Land Use

Because there would be fewer oil wells and steam generators associated with this alternative, it could have less of an impact on the aesthetic value of the project area than the proposed project. This alternative would thus be somewhat more compatible with the County’s Rural Lands land use category and with County plans and policies that protect scenic resources than the proposed project. By reducing the number of oil wells with this alternative, it may be possible to avoid development on steeper slopes that are

visible from public roads, such as Price Canyon. This is consistent with one of the planning areas standards in the San Luis Bay Inland Area Plan. The mitigation measures included for the proposed project reduce the difference in land use impacts between these two alternatives.

6.2.2.2 Traffic and Circulation

Short-term

This alternative would generate somewhat less traffic during the construction phase, since less construction personnel and construction material deliveries would be required. In addition, trip generation during the construction phase would be for a shorter duration since only 45 new production wells, 10 injection wells and one steam generator would be constructed.

Long-term

Assuming that, like the proposed project, this alternative would not require additional full-time workers at the expanded facilities after completion of the construction phase, trip generation associated with on-going operations would be the same as for the proposed project.

Mitigation Measures

Measures to mitigate the impacts of this alternative would be the same as for the proposed project. Residual impacts would be less than the proposed project.

6.2.2.3 Aesthetics

Short-term

There would be fewer oils wells and steam generators associated with this alternative, thus, it could have less of an impact on the aesthetic quality of the project area than would the proposed project. The drilling duration would be shorter under this alternative, and construction of the one steam generator would not be as intensive as construction of three, thus, there would be less impacts to visual resources.

Long-term

Since there will be fewer producer wells and injection wells and less steam generators with this alternative, there would be less of a long-term impact to visual resources.

Mitigation Measures

All of the recommended measures proposed for the project would apply to this alternative and would be recommended for inclusion. Residual impacts would be less than the proposed project.

6.2.2.4 Air Quality

This Alternative would involve only 45 production wells, such that the amount of pad grading would be reduced and construction emissions would be less than the Preferred

Alternative. However, construction emissions would exceed the APCD's thresholds and be considered a significant short-term impact to regional air quality.

Due to fewer wells and steam generators, long-term emissions would be less than the Preferred Alternative; 43.2 pounds per day NOx and 76.4 pounds per day ROG. However, these emissions would exceed the APCD's thresholds and be considered a significant impact to regional air quality. Emissions of toxic air contaminants would also be less than the Preferred Alternative; however, significant health risks may be associated with these emissions.

6.2.2.5 Biological Resources

Short-term

The reduced number of new wells under this alternative has the potential to decrease the impacts to biological resources resulting from the construction of the new well pads and modification of the existing ones. As with the proposed project, the specific locations of new well pads would determine how severe the impact to existing biological resources would be based on presence of special-status plant and animal species (e.g., Pismo's clarkia, Well's manzanita, California horned lizard, etc.), and nesting birds. Thus, short-term impacts to biological resources throughout the site would still be likely, but are expected to be reduced overall. The construction-related impacts of one new steam generator would not result impacts to biological resources, since the generator would be located in a pre-disturbed area.

Long-term

Because the overall area of additional disturbance would be reduced, the potential long-term impacts to biological resources are also expected to be less under this alternative. Specifically, there would only be 45 producing wells, 10 injection wells, and 1 steam generator constructed under this alternative. Thus, the permanent loss of existing habitat (e.g., oak woodland, Wells' manzanita, coyote brush scrub, etc.) would be less than under the proposed project. Moreover, the extant of habitat fragmentation and long-term impacts to special-status species associated with these habitats would be reduced. As such, the potential impact to biological resources would be substantially reduced with this alternative.

However, this alternative may prolong operations at the oil field, since fewer wells would result in a lower oil production rate than the proposed project. This in turn, would extend the duration of impacts to biological resources caused by operations at the oil field.

Mitigation Measures

All of the recommended measures included in the proposed project would apply to this alternative and would be recommended for inclusion. Please note that Mitigation Measure BIO-6 (Open Space Easement) would be substantially reduced in scope as part of this alternative. Residual impacts would be less than the proposed project.

6.2.2.6 Cultural Resources

Short-term

There would be no difference in impacts to cultural resources within this alternative as long as ESA 1, ESA 2, and Areas A, B, C, are avoided and no work is conducted within the 150-foot buffer zones.

Long-term

There would not be any impacts to cultural resources associated with this alternative as long as no maintenance activities involving surface disturbance are conducted within the 150-foot buffer zones of ESA 1, ESA 2, and Areas A, B, and C.

Mitigation Measures

Measures to reduce impacts associated with this alternative would be similar to those for the proposed project. Residual impacts would be less than the proposed project.

6.2.2.7 Geology and Soils

Short-term

The reduced number of new wells under this alternative has the potential to decrease the impacts of erosion resulting from the construction of the new well pads and modification of the existing ones. These impacts are identified as adverse but not significant for the proposed project. As with the proposed project, the specific locations for new well pads would determine how severe the impact of erosion would be based on topography, soil type, grading requirements, etc. In addition, the number of directionally drilled wells compared to the number of newly constructed wells would be a factor in determining the erosional impacts.

The construction-related impacts of one new steam generator would not differ significantly from the impacts of the three proposed steam generators, since the generators would be located next to each other in an area that already has such equipment.

Long-term

The potential long-term potential impact to groundwater quality may be less under this alternative, since the amount of wastewater produced would be less. Since there would only be 45 producing wells, 10 injection wells, and 1 steam generator under this alternative, the amount of wastewater produced and subsequently reinjected would be less than under the proposed project. As such, the potential impact to groundwater quality would not be as great.

Mitigation Measures

All of the recommended measures included in the proposed project would apply to this alternative and would be recommended for inclusion. Residual impacts would be less than the proposed project.

6.2.2.8 Paleontological Resources

Short-term

PAL-1: Construction during the proposed project could result in the inadvertent damage to paleontological resources during earthmoving activities.

Long-term

Without construction activities, no further scientific information on the Edna Member of the Pismo Formation would be revealed.

Mitigation Measures

Measures to reduce impacts associated with this alternative would be similar to the proposed project. Residual impacts would be less than the proposed project.

6.2.2.9 Noise

Short-term

For purposes of the noise analysis of this alternative, it is assumed that the 45 producer wells and 10 injector wells would be distributed over the entire project area and that the one steam generator would be located at approximately the same location as the three steam generators proposed for the project. Project noise levels at the nearest sensitive receptors from well construction and drilling are shown in Table 4.9-4. These projected noise levels are worst-case scenarios that would be the same for this alternative as for the proposed project, since the likelihood that wells could still be located at the nearest (worst case) points from the residences. The 45 dBA Leq nighttime standard would be equaled or exceeded at residences located within 4,000 feet of the project area and the proposed standards could be exceeded at all nine residences if drilling occurs at the nearest point in the project area of the residences. The drilling would, therefore, result in a significant noise impact upon nearby residences.

This alternative would not reduce the intensity of noise impact associated with drilling; however, the duration in which the 45 dBA Leq nighttime standard would be exceeded would be less, since less than half the number of wells would be drilled.

Long-term

Projected noise levels from the three new steam generators as part of the proposed project are shown in Table 4.9-3. With only one steam generator operating under this alternative, projected noise levels would be 5 dBA lower than those shown in the table for the proposed project. Sine no significant noise impacts would result from the three steam generators under the proposed project, the one steam generator under this alternative would also not result in any significant noise impact.

Mitigation Measures

All of the recommended measures included in the proposed project would apply to this alternative and would be recommended for inclusion. Residual impacts would be less than the proposed project.

6.2.2.10 Hazards/Risk of Upset

Short-term

The reduced number of new wells under this alternative has the potential to decrease the potential for hazards/risk of upset impacts resulting from the construction of additional oil wells.

Long-term

The potential long-term potential hazards/risk of upset impacts would be less under this alternative, since the number of operating oil wells and oil production would be less than the proposed project.

Mitigation Measures

All of the recommended measures included in the proposed project would apply to this alternative and would be recommended for inclusion. Residual impacts would be less than the proposed project.

6.2.3 Alternative 3 - Reduced Disturbance Alternative

Alternative 4 would allow the 95 new producer wells, 30 injector wells, and 3 steam generators associated with the project, but would confine the area in which the project could be built to existing pads. In essence, there would be no construction of the four new pads. The intent of this alternative is to minimize disturbance to resources, including biological resources, cultural resources, paleontological resources, and air quality. Figure 3.5 shows the location of the proposed new pads that would be constructed and existing pads that would be modified under the proposed project. Under this alternative, there would be no new pads.

6.2.3.1 Land Use

This alternative would have less impacts to resources, including air quality, biological, noise, and traffic. It would also have less of an impact on the visual quality of the project area than the proposed project. This alternative would be more compatible with the County's land use category Rural Lands and with County plans and policies that protect scenic resources than the proposed project. This alternative would have less impacts due to grading required for construction of the new pads. However, construction of the new pads will only require 2.68 acres of ground disturbance, thus, the difference in land use related impacts compared to the preferred alternative is not significant.

6.2.3.2 Traffic

Short-term

This alternative would involve construction of the same amount of facilities, including the 95 production wells, 30 injection wells, and steam generators. However, these facilities would all be established on existing sites; no new well pads would be constructed. As such, there would be less construction trips. Traffic associated with construction under this alternative would be less than the proposed project.

Long-term

Assuming that, like the proposed project, this alternative would not require additional full-time workers at the expanded facilities after completion of the construction phase, trip generation associated with on-going operations would be the same as for the proposed project.

Mitigation Measures

Measures to mitigate the impacts of this alternative would be the same as for the proposed project. Residual impacts would be less than the proposed project.

6.2.3.3 Aesthetics

Short-term

This alternative would involve construction of the same amount of facilities, including the 95 production wells, 30 injection wells, and steam generators. However, these facilities would all be established on existing sites; no new well pads would be constructed. As such, there would be less construction disturbance and less removal of tress. Short-term impacts to aesthetics under this alternative would be less than the proposed project.

Long-term

Since there will not be any wells established on the proposed new well pad sites, no well pumper units at Maino 16NW would be visible from motorists traveling along Price Canyon Road or Ormonde Road. The impacts associated with the steam generators would be the same, since these will be located on an existing steam generator site, as proposed under the proposed project.

Mitigation Measures

Measures to mitigate the impacts of this alternative would be the same as for the proposed project; however, less planting would be required to screen the proposed new well pad Maino 16NW. Residual impacts would be less than the proposed project.

6.2.3.4 Air Quality

This Alternative would involve the same number of production wells, but they would be confined to existing well pads. Therefore, the amount of pad grading would be substantially reduced and construction emissions would be much less than the Preferred Alternative. It is possible that the construction emissions would be less than significant.

The number of wells and steam generators would be the same as the Preferred Alternative; therefore, long-term emissions would also be the same.

6.2.3.5 Biological Resources

Short-term

The impacts associated with the reduced disturbance alternative would be less than those of the proposed project. Since no new wells pads would be constructed as part of

this alternative, there would be less adverse alterations to the existing biological resources of the project site. This reduced scope would eliminate the need for removal of several intact vegetative communities (e.g., oak woodland, Well's manzanita series, annual grassland, etc.) than would occur under the proposed project. However, there may be greater disturbances at the existing wells sites, since additional grading may be required to accommodate the additional wells associated with the applicant proposed new well pads locations. As such, special-status plant species located within and adjacent to these existing well sites would have the potential to be impacted as part of this alternative.

Long-term Impacts

Since the need for additional well pads would be eliminated, the potential long-term impacts to biological resources would also be reduced under this alternative. Specifically, the permanent loss of 0.45 acre of California live oak woodland (Maino 16NW) and 0.52 acre of Well's manzanita series (Signal 66C) would be eliminated as part of this alternative. Moreover, the extant of habitat fragmentation and long-term impacts to special-status species associated with these habitats would be reduced. As such, the potential impact to biological resources would be substantially reduced with this alternative.

Mitigation Measures

All of the recommended measures included in the proposed project for short-term impacts would apply to this alternative and would be recommended for inclusion with the exception of Mitigation Measure BIO-3, Provision A. (modification of Signal 66C). Furthermore, all of the recommended measures included in the proposed project for long-term impacts would apply to this alternative and would be recommended for inclusion with the exception of Mitigation Measures BIO-5, Provision A. (modification of Signal 113 A); and BIO-6 (Open Space Easement). Residual impacts would be less than the proposed project.

6.2.3.6 Cultural Resources

Short-term

This alternative would involve construction of the same amount of facilities, including the 95 production wells, 30 injection wells, and steam generators. However, these facilities would all be established on existing sites; no new well pads would be constructed. There would not be any impacts to cultural resources, since all work would take place on previously disturbed sites, which do not contain cultural resources.

Long-term

There would not be any impacts to cultural resources associated with this alternative as long as no maintenance activities involving surface disturbance are conducted within the 150-foot buffer zones of ESA 1, ESA 2, and Areas A, B, and C.

Mitigation Measures

Measures to reduce impacts associated with this alternative would be similar to the proposed project. Residual impacts would be less than the proposed project.

No mitigation would be required, since there would not be any impacts to cultural resources.

6.2.3.7 Geology and Soils

Short-term

The impacts associated with the reduced alternative would be less than those of the proposed project. Since no new pads would be constructed as part of this alternative, there would be less adverse changes to the physical conditions of the land at the project site, since no grading or construction would occur at the proposed new well pad sites. However, there may be greater disturbances at the existing wells sites, since additional grading may be required to accommodate the wells to be drilled at the proposed new well pads. There would be less short-term increase in erosion and sedimentation, since there would be less earth-moving and less exposed soil. Also, there would be less vegetation removed than would under the proposed project.

Long-term Impacts

There would be fewer long-term impacts associated with exposed soils, since the number of mature coast live oaks and manzanita removed would be less. Potential impacts to groundwater quality due to reinjection of wastewater would be similar under this alternative, since the amount of wastewater produced would be comparable the proposed project.

Mitigation Measures

All of the recommended measures included in the proposed project would apply to this alternative and would be recommended for inclusion. Residual impacts would be less than the proposed project.

6.2.3.8 Paleontological Resources

Short-term

This alternative would involve construction of the same amount of facilities, including the 95 production wells, 30 injection wells, and steam generators. However, these facilities would all be established on existing sites; no new well pads would be constructed. There would be greatly reduced adverse impacts to paleontological resource since minimal amount of native sediments would be disturbed.

Long-term

Without construction activities, no further scientific information on the Edna Member of the Pismo Formation would be revealed.

Mitigation Measures

Measures to reduce impacts associated with this alternative would be similar to the proposed project. Residual impacts would be less than the proposed project.

6.2.3.9 Noise

Short-term

This alternative would involve construction of the same amount of facilities, including the 95 production wells, 30 injection wells, and steam generators. However, these facilities would all be established on existing sites; no new well pads would be constructed. Projected noise levels at the nearest sensitive receptors from well construction and drilling under the proposed project are shown in Table 4.9-4. These projected noise levels are worst-case scenarios that would be the same for this alternative as for the proposed project, since wells would still be located at the nearest (worst case) points from the residences. The 45 dBA Leq nighttime standard would be equaled or exceeded at residences located within 4,000 feet of the project area and the proposed standards could be exceeded at all nine residences if drilling occurs at the nearest point in the project area of the residences. The drilling would, therefore, result in a significant noise impact upon nearby residences.

This alternative would not reduce the intensity of noise impact associated with drilling; and the duration in which the 45 dBA Leq nighttime standard would be exceeded would be the same because the same number of wells would be drilled. However, noise associated with construction of the well pads would be less, since no new well pads would be constructed.

Long-term

Projected noise levels from the three new steam generators as part of the proposed project are shown in Table 4.9-3. Noise impacts associated with the steam generators would be the same since the same number of steam generators would be constructed and they would be located at the same site as that under the proposed project.

Mitigation Measures

All of the recommended measures included in the proposed project would apply to this alternative and would be recommended for inclusion. Residual impacts would be less than the proposed project.

6.2.3.10 Hazards

Short-term

The impacts associated with the reduced alternative would be similar to those of the proposed project. No new pads would be constructed as part of this alternative, however, the same number of wells would be constructed.

Long-term Impacts

There would be similar long-term hazards impacts, since the number of operating oil wells and oil production would be similar to the proposed project. There would be slightly less potential for an oil spill from pipelines since it is anticipated that there would be less linear footage of oil flowlines laid from new oil wells to header locations as compared to the project.

Mitigation Measures

All of the recommended measures included in the proposed project would apply to this alternative and would be recommended for inclusion. Residual impacts would be similar than the proposed project.

6.2.4 Alternative 4 - Alternate Energy Source

The Energy Element of the San Luis Obispo General Plan encourages the development of local renewable resources, such as the solar potential in the Carrizo Plains. Such development could create local jobs and provide local sources of energy. Using renewable fuel resources, such as hydroelectric, solar, and cogeneration, will decrease fossil fuel consumption or improve energy efficiency.

The objective of the proposed project is to increase, by project completion, the amount of marketable gravity crude oil produced using a thermal (steam injection) process. Currently, approximately 1,800-1,900 BOPD (657,000-693,500 annually) are produced. The proposed project is anticipated to increase field production levels up to 5,000 BOPD, or 1,825,000 annually. An alternative energy source (or combination thereof) would have to be able to produce the equivalent amount of energy developed by the proposed project to meet project objectives. As such, it would have to generate the energy equivalent of approximately 3,000 BOPD or 1,825,000 annually.

Renewable energy sources include the following:

Solar Energy. There are two major types of solar energy technology that generate electricity: (1) photovoltaic and (2) solar thermal. Photovoltaic solar facilities directly convert sunlight into an electrical current at a low voltage. Photovoltaic solar cells absorbs sunlight and converts it directly to electricity through the reaction of electrons within the cell. Solar thermal technology first collects and concentrates solar energy and then converts the energy into electricity. The amount of sunlight that could be collected and concentrated into energy is constrained only by the economics of building large energy conversion plants and the efficiency of such facilities. Even so, it appears that more than enough solar energy could be generated to satisfy the county's need for electricity.

Biomass. Biomass refers to various organic waste products from agricultural and industrial processes that are converted into energy. Typical conversion techniques involve burning flammable materials to boil water and generate steam, which then drives steam turbine-generators to generate electricity. Another method is known as pyrolysis, which involves using biological methods to create biogas. Municipal waste is placed in a

chamber where anaerobic digestion (the bacterial digestion of organic materials in the absence of oxygen) produced biogas. Biogas can then be used to capture and used like natural gas or burned to drive steam turbines to generate electricity. Waste-to-energy facilities tend to be more expensive than some other forms of electricity generation, but they have the added benefit of extending the life of municipal landfills,

Wind Energy. San Luis Obispo County has only a few areas suitable for large scale wind energy conversion system development. Wind turbines consist of blades, rotor, transmission, electrical generator, and control system, all mounted on a tower. Wind causes the blades to rotate, generating mechanical energy that is converted to electrical energy by a generator. Wind turbines may be connected to a utility grid system as single units or grouped into arrays. The generators do not emit pollutants to the air or to water resources; water is not needed in the production cycle; and the machines are preasssmebled and can be installed relatively quickly.

Geothermal. Historically, San Luis Obispo has made direct use of geothermal energy from hot springs located near Paso Robles and Avila Beach. The county's geothermal energy may be used as a supply of low temperature heat in areas like Paso Robles.

6.2.4.1 Land Use

This alternative involves developing renewable energy sources in lieu of expanding existing operations to increase daily production of crude oil. To achieve this, considerable construction would be required to build the necessary infrastructure, such as a solar cell facility, wind farm, or biomass facility. Construction of such facility may result in considerable impacts to biological resources, noise, and aesthetics, and conflict with local plans and policies due to the significant land required to build a facility large enough to produce the equivalent energy as that which will be produced by the proposed project. As such, the proposed project is more consistent with existing land use plans and policies.

6.2.4.2 Traffic

Short-term

This alternative would reduce traffic to the project site since no additional wells would be installed under this alternative. However, traffic would increase in other areas during the construction phase of the renewable energy facility. Furthermore, such traffic would be considerably greater, since construction would involve development of an entirely new energy facility, as opposed to expansion of an existing one.

Long-term

Trip generation associated with on-going operations for this alternative may be similar, since there would be a number of individuals needed to operate the alternate energy facility.

Mitigation Measures

Measures to reduce impacts associated with this alternative would be similar to the proposed project. Residual impacts would be greater than the proposed project.

6.2.4.3 Aesthetics

Short-term

Development of an alternate energy source that produces the equivalent energy as the proposed project would require substantial effort to construct a facility large enough to produce such energy. Major earthwork and grading would be required to build a facility that utilizes either solar, wind, biomass, or geothermal technologies. The impacts to aesthetics associated with such effort would be greater than the proposed project.

Long-term

Long-term impacts would be greater under this alternative than the proposed project, because a new facility would have to be created to produce the equivalent energy. The proposed project involves expansion of an existing facility that has been in operation since 1906. Construction of an alternate energy facility, that utilizes either solar, wind, biomass, or geothermal technologies would create substantial light and glare or other related impacts.

Mitigation Measures

To minimize the impacts to aesthetics, the alternate energy facility could be located in an area that is shielded from major view corridors. For example, a solar facility could be located near the Carrizo Plain, at a site where KVAs are blocked by the natural landscape.

The design and color of the facility may be modified so that is blends in with the natural landscape of the area.

Residual Impacts

The residual impacts to aesthetics under this alternative would be greater than the proposed project.

6.2.4.4 Air Quality

Short-term

Development of an alternate energy source that produces the equivalent energy as the proposed project would require substantial effort to construct a facility large enough to produce such energy. Major earthwork and grading would be required to build a facility that utilizes either solar, wind, biomass, or geothermal technologies. The short-term impacts to air quality associated with such effort would be greater than the proposed project.

Long-term

Long-term impacts would be less under this alternative than the proposed project, because a new facility using renewable energy sources would most likely involve either solar or wind power. Such technologies develop energy without producing emissions.

6.2.4.5 Biological Resources

Short-term

Development of an alternate energy source would require extensive construction to build a facility capable of producing the equivalent energy of the proposed project. Such construction would result in a substantial change in the existing conditions of the project area including existing biological resources. Grading, excavation, and removal of vegetation would be required, which may result in substantial impacts to special-status species known to occur in the area and intact plant communities. Further, indirect impacts to Pismo Creek and associated aquatic special-status species (e.g., California red-legged frog, southwestern pond turtle, etc.) may occur due to increased sedimentation during construction. Because this alternative would require development of an entirely new facility, the impacts would be greater than the proposed project.

Long-term

The long-term impacts would also be greater under this alternative than the proposed project. Development of a solar, wind, geothermal, or biomass energy source may require construction of a large facility expected to cover a broad surface area. Therefore, this alternative would involve disturbance of a much greater magnitude to biological resources than the applicant proposed project. Such disturbance could result in the permanent loss of major habitats known support a variety of special-status plant and animal species. Further, construction of impervious surfaces over a large area could result in increased run-off and further long-term sedimentation impacts to Pismo Creek and associated habitat.

Mitigation Measures

Many of the recommended measures included in the proposed project would apply to this alternative and would be recommended for inclusion. Residual impacts to biological resources would still be greater than the proposed project.

6.2.4.6 Cultural Resources

Short-term

Impacts to cultural resources may be greater under this alternative, since it would involve construction of an entirely new energy facility, that may be located in an area with cultural resources. Surveys would be required to determine the extent of cultural resources, but considering the relatively high occurrence of cultural resource sites within San Luis Obispo County, it can be projected that such resources may occur at an appropriate site for an alternate energy facility. Furthermore, there would most likely be greater surface disturbance with this alternative, which could result in adverse impacts to cultural resources due to construction-related impacts.

Long-term

Operation of an alternate energy facility would most likely not result in impacts to cultural resources. However, periodic maintenance activities that would require surface disturbance, such as trenching for installation of conduit or pipe, may result in potential

impacts. Long-term impacts to cultural resources may be similar to the proposed project.

Mitigation Measures

Measures to reduce impacts associated with this alternative would be similar to the proposed project. Residual impacts would be similar to the proposed project.

6.2.4.7 Geology and Soils

Short-term

Development of an alternate energy source would require extensive construction to build a facility capable of producing the equivalent energy of the proposed project. Such construction would result in a substantial change in the existing conditions of a site. Grading, excavation, and removal of vegetation would be required, which would cause erosion and sedimentation impacts. Because this alternative would require development of an entirely new facility, the impacts would be greater than the proposed project.

Long-term

The long-term impacts would be greater under this alternative than the proposed project. Development of a solar, wind, geothermal, or biomass energy source may require construction of a large facility that may cover a large surface area. For example, a solar facility would require construction of an array of photovoltaic cells that would involve disturbance of a much greater area than the proposed project. This disturbance could alter erosion and sedimentation processes of the area.

Potential impacts to groundwater quality may be less with this alternative, since none of the alternate energy technologies would involve reinjection of wastewater.

Mitigation Measures

Many of the recommended measures included in the proposed project would apply to this alternative and would be recommended for inclusion. Residual impacts would still be greater than the proposed project.

6.2.4.8 Paleontological Resources

Short-term

Construction under this alternative could result in the inadvertent damage to paleontological resources during earthmoving activities.

Long-term

Periodic maintenance activities may require surface disturbance, such as trenching for installation of conduit or pipe, which could result in potential impacts if the facility is located in at a site with similar paleontological resources. Long-term impacts to paleontological resources may be similar as the proposed project.

Mitigation Measures

Measures to reduce impacts associated with this alternative may be similar to the proposed project. Residual impacts may be similar as the proposed project.

6.2.4.9 Noise

Short-term

Short-term noise impacts would be greater under this alternative than the proposed project. The proposed project involves expansion of an existing oilfield, whereby the amount of construction is minimal. Development of an alternate energy that produces an equivalent amount of energy would require substantially more construction. Such construction would require use of heavy equipment, such as dozers and excavators, which would produce substantial noise. If the facility were constructed in an area away from sensitive noise receptors, impacts would be minimal

Long-term

Long-term noise impacts would be less or greater than the proposed project, depending on the type of renewable energy deployed. Solar energy, which typically involves use of photovoltaic cells, would not produce any noise, whereas wind energy would produce noise due to the rotating windmills.

Mitigation Measures

To lessen noise impacts associated with an alternate energy source, the site could be located in an area away from noise sensitive receptors. With incorporation of this measure, noise impacts would be similar as the proposed project.

6.2.4.10 Hazards/Risk of Upset

Short-term

Development of an alternate energy source would require extensive construction to build a facility capable of producing the equivalent energy of the proposed project. Such construction would require large amounts of fuels and other hazardous materials for construction activities. However, the potential for short-term spills or releases from the project site under this alternative would be less than the proposed project.

Long-term

The long-term hazards impacts would be less at the project site under this alternative. However, an alternate energy source may have equal or greater potentials for risk of upset depending on the energy source and wastes produced as a result of its operation.

Mitigation Measures

The recommended mitigation measures would not apply under this alternative, since no new oil production would occur at the project site. Residual impacts would be less than the proposed project.

6.2.5 Alternative 5 - Fully Mitigated Project Alternative

The Fully Mitigated Project is an alternative whereby the mitigation measures identified in Chapter 5.0 to reduce significant or potentially significant impacts to less-than-significant levels are factored into the project. With the mitigation measures included in the project as proposed, the project becomes an entity that is defined differently than originally proposed.

6.2.5.1 Land Use

This alternative would have fewer impacts to resources, including air quality, biological, noise, and traffic through the inclusion of mitigation measures. It would also have less of an impact on the visual quality of the project area than the proposed project. This alternative would be more compatible with the County's land use category Rural Lands and with County plans and policies that protect scenic resources than the proposed project.

Mitigation Measures

This alternative would include all measures to mitigate impacts. Residual impacts would be less than the proposed project.

6.2.5.2 Traffic

Short-term

This alternative would include mitigation measures to minimize degradation of traffic safety resulting from entering and existing trucks on Price Canyon Road during construction activities. As such, impacts to traffic would be less than the proposed project.

Long-term

Assuming that, like the proposed project, this alternative would not require additional full-time workers at the expanded facilities after completion of the construction phase, trip generation associated with on-going operations would be the same as for the proposed project. Long-term impacts associated with increased tanker truck trips would be less under this alternative because such increased trips would be limited to non-peak hours, which would reduce safety impacts.

Mitigation Measures

This alternative would include all measures to mitigate impacts. Residual impacts would be less than the proposed project.

6.2.5.3 Aesthetics

Short-term

Construction-related visual impacts to motorists traveling along Price Canyon Road, nearby residences, and passengers on Amtrak passenger trains traveling along the Union Pacific Railroad would be the same under this alternative as the proposed project.

Long-term

Impacts associated with the steam generators would be the same, since these will be located on an existing steam generator site, as proposed under the proposed project. Long-term impacts to aesthetics associated with removal of trees would be less under this alternative, since protective measures to avoid and/or minimize impacts to oak trees would be incorporated into the project. In addition, impacts resulting from an increased number of well pumper units would be less through incorporation of measures that involve screening via replanting of vegetation.

Mitigation Measures

This alternative would include all measures to mitigate impacts. Residual impacts would be less than the proposed project.

6.2.5.4 Air Quality

Short-term

Shot-term drilling equipment emissions would be less than the proposed project through incorporation of equipment emission control measures, such as installation of an NOx reducing catalyst/catalyzed diesel particulate filter system. Fugitive dust resulting from construction would also be less through the incorporation of dust control measures, such as use of water trucks or sprinkler systems during construction. Impacts would be further reduced through incorporation of measures to offset impacts by contributing to an off-site mitigation fund.

Long-term

~~NOx and ROG emissions from operation of the steam generators would be less under this alternative through use of a lo-NOx design and compliance with APCD Rule 430.~~ Fugitive hydrocarbons would be reduced through implementation of the provisions of APCD Rule 417, which requires quarterly monitoring for leaks, and repair of leaks completed with 14 days for minor gas leaks, 5 days for major gas leaks and 2 days for liquid leaks. Health risks would be reduced through incorporation of a measure requiring completion of a comprehensive facility-wide health risk assessment according to the Emission Inventory Criteria and Guidelines for the “Hot Spots” program. The Assessment would include a facility-wide inventory of toxic air contaminants, air dispersion modeling to determine ground-level concentrations at adjacent residences and application of unit risk factors to identify cancer and non-cancer health risk. It should be noted that these measures are required as part of permitting by the APCD and may not be considered mitigation.

Mitigation Measures

This alternative would include all measures to mitigate impacts. Residual impacts would be less than the proposed project.

6.2.5.5 Biological Resources

Short-term

Short-term impacts to biological resources would be less under this alternative through the inclusion of several mitigation measures designed to reduce impacts. Such measures will avoid or minimize impacts to nesting migratory birds, special-status plant and animal species, and special-status species potentially occurring within the nearby Pismo Creek and associated tributaries.

Long-term Impacts

Long-term impacts to biological resources would be less under this alternative through the inclusion of several mitigation measures designed to reduce impacts. These include protective measures to avoid and/or minimize impacts to oak trees designated for long-term preservation, and measure to compensate for the permanent loss of vegetation resulting from project implementation and potential long-term degradation of adjacent habitat areas from projected long-term utilization of the site

Mitigation Measures

This alternative would include all measures to mitigate impacts. Residual impacts would be less than the proposed project.

6.2.5.6 Cultural Resources

Short-term

Impacts to cultural resources would be less under this alternative than the proposed project through the inclusion of measures to avoid existing cultural resource sites SLO-353, SLO-652, and SLO-1266. These measures required that any future ground disturbances within a 150-foot buffer from the sites shall be subject to a subsurface archaeological excavation program to assess artifact presence in these areas.

Such measures also require that in the event that unknown cultural remains are encountered anywhere within the project area during construction, activities shall be redirected to another area until a qualified archaeologist can be retained to evaluate the potential significance of the finds in a Phase 2 archaeological significance investigation.

Long-term

There would not be any impacts to cultural resources associated with this alternative as long as no maintenance activities involving surface disturbance are conducted within the 150-foot buffer zones of ESA 1, ESA 2, and Areas A, B, and C.

Mitigation Measures

This alternative would include all measures to mitigate impacts. Residual impacts would be less than the proposed project.

6.2.5.7 Geology and Soils

Short-term

There would be less short-term increases in erosion and sedimentation, through inclusion of mitigation measures requiring the applicant to prepare and implement a Sediment and Erosion Control Plan (SECP) and a grading plan for the proposed project.

Long-term Impacts

There would be fewer long-term impacts associated with exposed soils, since the number of mature coast live oaks and manzanita removed would be less due to the inclusion of measures requiring the avoidance of such trees and shrubs where feasible. Potential impacts to groundwater quality due to reinjection of wastewater would be less under this alternative, due to measures requiring petroleum products to be removed from wastewater generated in the oil recovery process prior to reinjection. In addition, the water quality of the shallow aquifer zone beneath and downgradient from the site would be monitored regularly to detect any water quality impacts of project activities (e.g., steam or produced water injection).

Mitigation Measures

This alternative would include all measures to mitigate impacts. Residual impacts would be less than the proposed project.

6.2.5.8 Paleontological Resources

Short-term

Impacts to paleontological resources would be reduced under this alternative through the inclusion of a mitigation measure requiring the applicant to develop (prior to approval of the project) and implement a paleontological mitigation monitoring plan to minimize impacts to paleontological resources.

Long-term

The proposed project will not entail excavation of land during operations. Consequently, no impact to paleontological resources are anticipated as long as maintenance activities do not involve surface disturbance. If such disturbance were to occur, then mitigation measure PAL-1 would apply.

Mitigation Measures

This alternative would include all measures to mitigate impacts. Residual impacts would be less than the proposed project.

6.2.5.9 Noise

Short-term

Noise impacts associated with construction and drilling would be less under this alternative through incorporation of mitigation measures, including restricting (excluding drilling activities) the use of heavy equipment or heavy-duty trucks from 7 a.m. to 7 p.m.

drilling activities. Also, noise attenuation blankets or other devices with a sound transmission class of 25 or greater would be required to completely enclose each drilling operations at well pads Signal 113D and Morehouse 303. These two measures would ensure that the 45 dBA L_{eq} nighttime standard is not exceeded.

Long-term

Projected noise levels from the three new steam generators as part of the proposed project are shown in Table 4.9-3. Long-term noise impacts would be similar as the proposed project, because no mitigation is required for long-term operations of the project.

Mitigation Measures

This alternative would include all measures to mitigate impacts. Residual impacts would be less than the proposed project.

6.2.5.10 Hazards

Short-term

The impacts associated with the reduced alternative would be similar to those of the proposed project. No significant impacts were identified, thus, no mitigation measures were proposed.

Long-term Impacts

There would be less long-term hazards impacts, because mitigation measures, including conducting daily inspections of drainages, known nearby well sites, and surface exposures of oil sands within 2,000 feet of injection locations to identify oil release at the ground surface would be required. Also, prior to commencement of oil production from Phase IV wells, PXP would be required to update their Spill Prevention Control and Countermeasure Plan (SPCC) for the Arroyo Grande oil field address the increased production and spill scenarios. The SPCC update would include measures to both reduce the likelihood of an oil spill entering Pismo creek through engineered containment devices and regular monitoring.

Mitigation Measures

This alternative would include all measures to mitigate impacts. Residual impacts would be less than the proposed project.

6.2.6 Alternative 6 (Environmentally Superior Alternative)

CEQA Guidelines (Section 15126.6(a) and (e)(2)) require that an EIR's analysis of alternatives identify the "environmentally superior alternative" among all of those considered. In addition, if the No Project Alternative is identified as environmentally superior, then the EIR also must identify the environmentally superior alternative among the other alternatives.

Under CEQA, the goal of identifying the Environmentally Superior Alternative is to assist decision-makers in considering project approval. CEQA does not, however, require an

agency to select the environmentally superior alternative (CEQA Guidelines Sections 15042-15043).

In the comparison presented in Table 6-1, it is apparent that Alternative 2 and 3 would each reduce impacts from the proposed project and neither of them would have greater impacts on any resource than the proposed project. Alternative 4 would have greater impacts to several resources over the proposed project, including aesthetics, geology and soils, and noise; however, impacts to air quality would be less under this alternative in the long-term.

The same County air quality significant thresholds that would be exceeded by the proposed project would also be exceeded (albeit somewhat less) with the reduced project alternative. The reduced disturbance alternative has the potential to benefit biological, paleontological, land use, and visual resources if, with no new pads, it would be easier to avoid environmentally sensitive areas. This alternative would have comparable impacts to noise associated with drilling; however, there would be less noise due to well pad construction. Both Alternative 2 and Alternative 3 represent only a marginal improvement to resource areas.

The mitigated alternative is identified as the Environmentally Superior Alternative because it would meet all of the project objectives consistent with the Master Plan for the oil field, minimize most of the project impacts, and better meet County policies than either Alternative 2 or 3.

Alternative 5 will have less impacts to all of the resource areas than Alternative 2, 3, and 4. Although the No Project Alternative will have less impacts than the Alternative 5, it will not meet any of the objectives of the project and is not consistent with the Master Plan for the oil field. As such, the EIR found that the Alternative 5 – Fully Mitigated Project that includes all mitigation measures factored into the project is the Environmentally Superior Alternative.

CHAPTER 7.0
GROWTH INDUCEMENT AND SIGNIFICANT IRREVERSIBLE IMPACTS

7.1 GROWTH-INDUCING IMPACTS

Section 2100(b)(5) of the California Environmental Quality Act (CEQA) requires a discussion of the ways in which a project may induce growth in an area. Growth-Inducement, as defined by the CEQA Guidelines, are those consequences of a proposed project that "…could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are project which would remove obstacles to population growth…" Population growth, in turn, can tax community facilities and may require construction of new infrastructure that could cause significant environmental effects at a later time. However, growth should not be assumed to be necessarily beneficial, detrimental, or of little significance to the environment.

Typically, the growth-inducing potential of a project would have a significant impact if it either fostered growth or created a capacity to accommodate growth above and beyond levels expected in the absence of the project. Of particular concern are those projects that, when constructed, serve to remove an existing barrier to growth, such as a major upgrade to a wastewater treatment facility, construction of a new road in an undeveloped area, or the provision of sewer, water, or other utility lines with excess capacity that could accommodate substantial local development. However, the creation of growth-inducing potential does not automatically lead to growth, because growth at the local level is controlled by a variety of different influences, including economic market forces, local politics, and existing development conditions.

As discussed in Chapter 3.0, Project Description, the proposed project is a oil development expansion project designed increase crude oil production of the Arroyo Grande field. Since oil production has occurred in the project area since 1906, the project would only expand oil development activities within an existing area that is already used for this purpose. The project would not introduce a new land use into the area, nor would it cause a conversion of surrounding land uses (which are primarily agricultural) to more intensive land uses.

The employment generated by the project would not induce growth in the community. PXP currently employs 30 permanent and contract employees consisting of a supervisor, an office clerk, engineers, and maintenance and operation employees. The proposed project may require temporary employees during construction; however, no new permanent employees will be needed during operations. The workers needed during the construction phase would be drawn from the San Luis Obispo area. The project would not create additional infrastructure, such as public roads, and would not extend existing utility lines, including water and sewer.

7.2 SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL IMPACTS

Section 21100(b)(5) of the CEQA Guidelines requires a discussion of irreversible environmental changes that would occur as a result of project implementation. According to Section 15126.2(c) of the CEQA guidelines, "…uses of nonrenewable resources during the initial and continued phases of the project may be irreversible since a large commitment of such resources

makes removal or nonuse thereafter unlikely. Primary impacts and, particularly, secondary impacts (such as highway improvement which provides access to a previously inaccessible area) generally commit future generations to similar uses. Also, irreversible damage can result from environmental accidents associated with the project. Irretrievable commitments of resources should be evaluated to assure that such consumption is justified." The Phase IV Development Plan project would result in the following irreversible environmental changes:

- Use of nonrenewable resources in the construction of the proposed facilities;
- Long-term commitment of land for the new well pads; and,
- Greater long-term use of nonrenewable resources through the oil development operations.

The following sections describe both the direct and indirect irreversible changes that would result from project implementation, as well as the justification for the approval of such changes at this time.

7.2.1 USE OF NATURAL RESOURCES BY THE PROJECT

Project implementation would consume non-renewable resources for four main purposes:

- The mobilization of equipment, supplies, and manpower at construction sites;
- The use of natural resources as construction material for the project components;
- The consumption of resources in the course of long-term project operations and maintenance; and,
- Such use would not be wasteful and would be focused on achieving the worthwhile goal of energy production.

7.2.2 IRREVERSIBLE COMMITMENT OF LAND

The proposed project would not involve the additional irreversible commitment of land for construction of the proposed project beyond that which has previously been committed. The project will be conducted in an existing oil field that has been in operations since 1906. Well pad construction is reversible, such that constructed pads may be abandoned upon completion of oil production.

7.2.3 INCREASED USE OF NON - RENEWABLE RESOURCES

If the proposed project is not implemented, existing oil and gas reserves will remain idle and will not be extracted for beneficial uses. The amount of non-renewable resources consumed under the proposed project, which consists of natural gas for operation of the steam generators, is outweighed by the resources that will be developed as a result of this project. The main goal of the proposed project is to develop the non-renewable oil and gas resources while the existing infrastructure exists to support the development. Therefore, the non-renewable resources demand by the proposed project is not considered significant.

The proposed project would directly increase the volume of oil and gas extracted and produced locally, but would not increase the net consumption of oil and gas. The production from the project would be used to satisfy existing demand.

The proposed project could result in environmental accidents (e.g., oil spills) that have the potential to create irreversible impacts to biological resources. Potential impacts can be reduced through the use of adequate design and operating procedures and effective emergency response plans specifying staffing and equipment needs. However, the potential remains for irreversible damage as an unlikely upset associated with the operation of the proposed project.

CHAPTER 8.0
CUMULATIVE ANALYSIS

8.1 INTRODUCTION

CEQA Guidelines (Office of Planning and Research, 1999) refer to cumulative impacts as "…two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.

a. The individual effects may be changes resulting from a single project or a number of separate projects.

b. The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other costly related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time." (CEQA Guidelines Section 15355).

The Guidelines require a discussion of significant cumulative impacts, the severity of the impacts, and the likelihood of occurrence; however, the discussion need not provide as great a detail as is provided of the effects attributable to the project alone. The discussion of cumulative impacts should be guided by "standards of practicality and reasonableness, and should focus on the cumulative impact to which the identified other projects contribute rather than the attributes of other projects which do not contribute to the cumulative impact. The cumulative analysis must include the following:

a. A list of past, present, and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the agency, or

b. A summary of projects contained in an adopted general plan or related planning document, or in a prior environmental document which has been adopted or certified, which described or evaluated regional or areawide conditions contributing to the cumulative impact. Any such planning document shall be referenced and made available to the public at a location specified by the lead agency.

8.2 DISCUSSION

The cumulative analysis of this EIR is based on a list of 2 projects that are located near the project area, and are in various stages of project planning or development. The list was compiled on the basis of the environmental resources that could potentially be affected by each project, the type of project, and the location of the impact relative to the proposed project. These projects are summarized below:

8.2.1 King South Ranch

The 470-acre King South Ranch is located along Price Canyon Road northeast of the Pismo Beach city limits. See Figure 8-1. The site is currently designated Agricultural by the County of San Luis Obsipo General Plan, which allows a total of 47 dwelling units on ten-acre parcels.

The King South Ranch site has been included within an areawide planning analysis *City of Pismo Beach, Price Canyon Constraints and Opportunities Study (2002).* This study is incorporated by reference into this document. As indicated therein, one alternative for the 470-acre King South Ranch includes: a) 103 acres of rural residential/visitor-serving uses that may include as many as 400 hotel or resort-type units, b) 22 acres of rural residential use containing a total of 29 low density residential dwelling units, c) 62 acres of agricultural/recreation uses involving a combination of vineyards, a visitor's center, public trails, and an extension of a golf course from an adjacent parcel. The King South Ranch is also identified on the Land Use Element of the City of Pismo Beach General Plan for the following uses: an 18 to 27 hole golf course, a clubhouse, restaurant and other recreational uses (tennis courts, sports facilities, trails, etc.).

On-site topography ranges from steep slopes and hillsides that generally run parallel to Price Canyon Road. These heavily-wooded north- and west-facing slopes contain dense oak woodland habitat. Lower elevations of the site contain stands of oaks, sycamores, cottonwoods, eucalyptus and other large tree species. Gently sloping to flat areas contain sage scrub, chaparral, and native grassland vegetation.

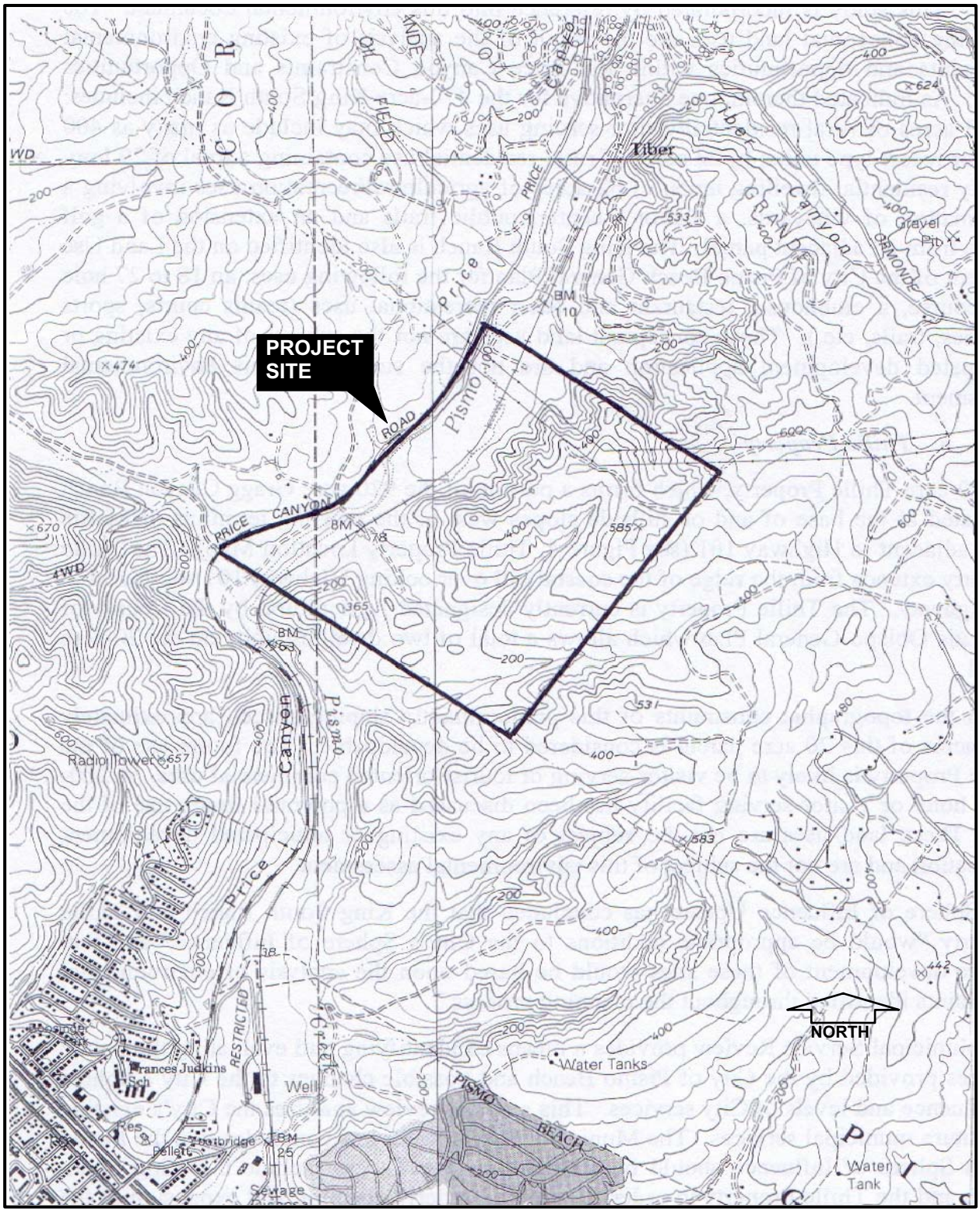
The April 2002 Sphere of Influence Update for the City of Pismo Beach concluded that the King South Ranch would be an appropriate addition to the City's Sphere of Influence to provide orderly planning and expansion of the community. No formal application has been submitted for the project.

8.2.2 Tentative Tract Map #2388

This project involves the subdivision of a 1,022-acre site into sixteen lots ranging in size from 20.0 acres to 28.7 acres, an agricultural lot of 470 acres and a remainder parcel of 204 acres, including construction of roads, and water storage tank. The property is located in the County of San Luis Obispo on the west side of Price Canyon Road, approximately ½ mile north of the City of Pismo Beach. See Figure 8-2. The project was approved by the SLOPC on April 19, 2002.

Potential impacts include impacts to visual resources, biological resources, cultural resources, and traffic.

Implementation of these projects would result in the development of a cumulative total of 1,492 acres. New development will affect a number of resources, most notably biological resources, air quality, noise, and visual resources. The cumulative effects of these projects are detailed in each resource chapter.



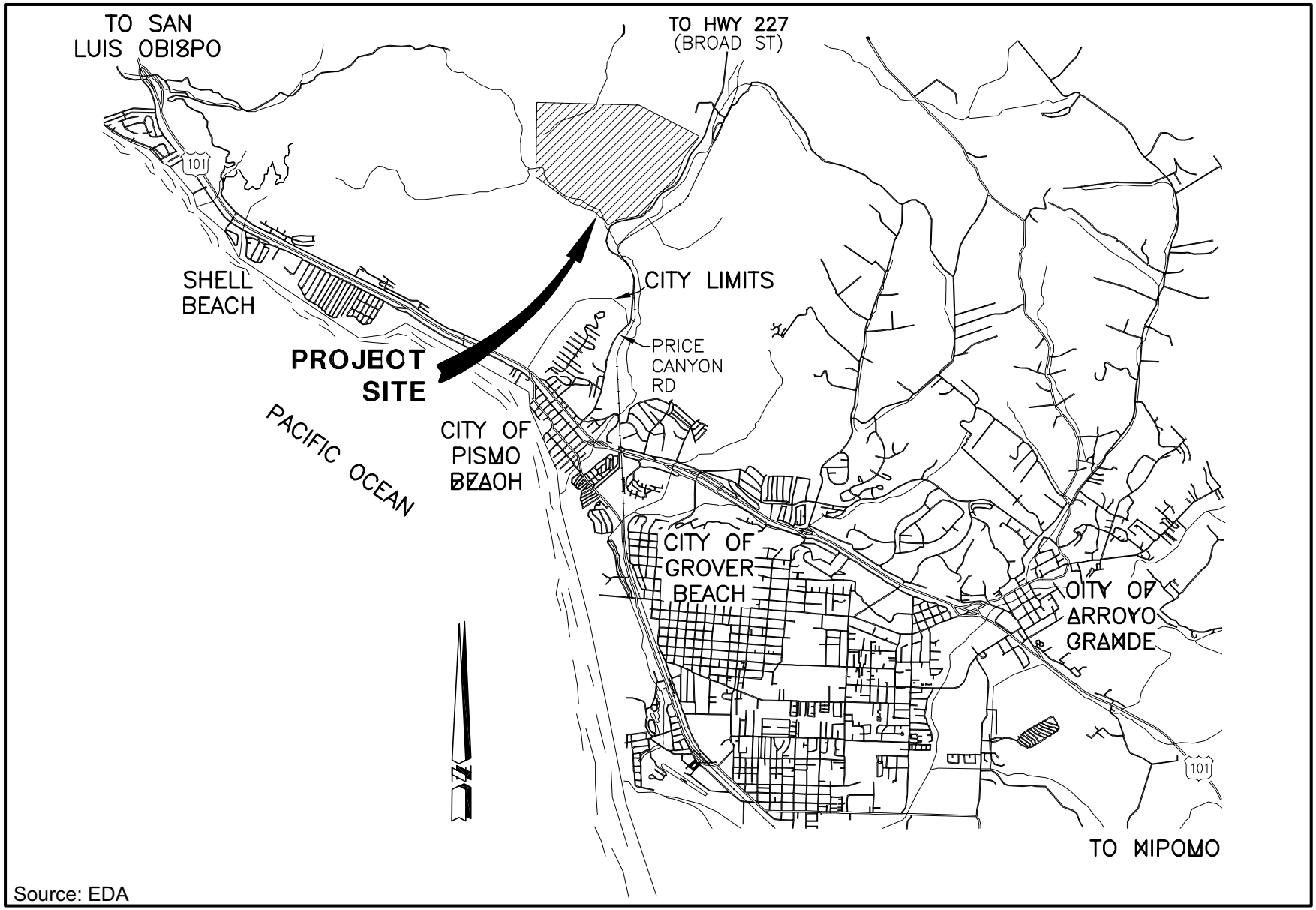
Source: Douglas Wood & Associates, Inc

padre associates, inc.
ENGINEERS, GEOLOGISTS & ENVIRONMENTAL SCIENTISTS

KING SOUTH RANCH

PXP Phase IV Development Plan EIR

FIGURE 8-1



Source: EDA

padre associates, inc.
ENGINEERS, GEOLOGISTS & ENVIRONMENTAL SCIENTISTS

TENTATIVE MAP TRACT No. 2388

FIGURE 8-2

CHAPTER 9.0
RESPONSE TO COMMENTS

Comments from the following individuals, organizations and governmental agencies listed below were received on the Draft EIR. Copies of the letters with individual numbered comments are included along with responses to these comments following each letter. Where indicated, changes in the text of the Final EIR have been made.

Individuals

1. Rudy Natoli
2. Mr. & Mrs. Carmen R. Porco

Private Organizations

3. Plains Exploration and Production (PXP)
4. King Ventures

Governmental Agencies

5. San Luis Obispo Air Pollution Control District
6. CDF/San Luis Obispo Fire Department
7. California Regional Water Quality Control Board
8. California Department of Conservation

RESPONSES TO COMMENTS FROM RUDY NATOLI

March 26, 2004

1. Comment noted. Although Price Canyon has scenic qualities, the oil field has been in operations since 1906. The project site currently looks like an oilfield and will continue to look like an oilfield. A visual analysis was performed and potential visual impacts were determined, along with appropriate mitigation. Photo simulations from Price Canyon Road and future residential land uses are not warranted. The three new steam generators will be placed adjacent to existing steam generators. If placed at location A, they will not be visible to motorists traveling along Price Canyon Road. If they are placed at Location B, they will be placed in front of two existing steam generators and will not result in significant visual impacts. The new wells will result in visual impacts; however, planting of native oaks and other vegetation will reduce visual impacts.

2. Comment noted. The proposed new well pad locations have been selected based on engineering studies of the oil field. For example, an alternative to the Maino 16NW well pad will not work due to the relatively shallow depth (i.e., 1500-foot depth of production in the field) and the limited vertical distance to directionally drill. Landscaping of new facilities has been proposed as mitigation to screen visual impacts. See mitigation measure AES-2 and AES-4.

3. Comment noted. As a condition of approval, no increased haul trips will occur during peak AM and PM periods (7:00 AM – 9:00 AM and 4:00 to 6:00 PM) Monday through Friday. Therefore, the additional 25 haul truck trips per day will not result in a significant impact. Refer to response to comment #13 from CDF/County of San Luis Obispo Fire Department.

4. Comment noted. As discussed in Section 5.4 Air Quality (page 5.4-15), PXP recently conducted a Health Risk Assessment (HRA) (see Appendix D) for the proposed project based on a previous HRA that was provided to APCD in December 2002 for a turbine generator project at the oil facility. The assessment demonstrated cancer risk values well below the cancer risk threshold (regulatory limit for cancer risk is 1.0E-06) by a factor of 10-20. In addition, all acute and chronic risk are well below the APCD Rule 219.E.3 and Rule 219.E.4 risk factor thresholds of 1.0 for sources with Toxics Best Available Control Technology (T-BACT). Therefore, the health risks associated with the proposed project will most likely not result in unacceptable human health risks. This will be further verified through permitting with the APCD and the subsequent HRA. If any risks are identified, which are unlikely, measures, such as those discussed in Section 5.4, will be implemented.

5. All potential risks have been mitigated to the extent feasible through CDF/County Fire training and exercises, adherence to State requirements, and limiting any increased truck traffic to non-peak periods. See response to comment #4 and refer to added mitigation measure HAZ-2A.

6. The Clean Air Plan is based on the effect of control measures on future emission projections. The emission projections are based on activity factors, primarily population growth. The proposed project would not induce population growth, and does not require a consistency analysis according to the CEQA Air Quality Handbook. In addition, the County was re-designated an ozone attainment area in January 2004, such that the Clean Air Plan

has achieved its primary goal and consistency with the Plan becomes less relevant. Therefore, a Clean Air Plan consistency analysis has not been included in the EIR.

7. See response to comment #4. A detailed risk assessment was not completed as part of the EIR because precise details regarding equipment specifications, operating scenarios, control devices, emissions offsets and BACT determination would be developed during the APCD permitting process and are not fully known at this time. Complex air dispersion modeling and exposure assessment conducted as part of the risk assessment relies on these details, and may yield false conclusions in the absence of such information.
8. Comment noted. Please refer to Sections 5.5.2 for a complete discussion of the natural habitats/plant communities existing within the oil field and associated special-status plant and wildlife species known to occur and/or with the potential to occur on-site based on the presence of suitable habitat. Additionally, please refer to Section 5.5.3 for a complete discussion of potential impacts to natural habitats and special-status species and mitigation measures that have been incorporated into the EIR.
9. Comment noted. Groundwater at the Arroyo Grande oilfield overlies naturally occurring oil. The oil regularly migrates naturally upward from lower elevations toward the surface, frequently coming into contact with the groundwater. A full chemical analysis was performed of the existing groundwater wells at the oilfield. See Section 5.7 Geology and Soils (page 5.7-6) and Appendix I. As part of PXP's efforts to protect water quality, annular seals and casing integrity of existing wells shall be verified and non-productive wells shall be properly abandoned. These requirements will be imposed upon PXP as conditions of approval.
10. Comment noted. The proposed project is an expansion of an existing oil field. The proposed project does not create a new petroleum facility as discussed in Policy 64, Guideline 64.2
11. Comment noted. Please refer to response to comments received from CDF/County Fire.
12. Comment noted. Please refer to added mitigation measures HAZ-1A, HAZ-1B, HAZ-2, and HAZ-3.
13. Comment noted. Please refer to response to comments received from CDF/County Fire.
14. Comment noted. A 100-foot buffer will be maintained from Pismo Creek for all proposed activities, except for Well Pads Morehouse 303 and Signal 151. At these two sites, a 50-foot buffer will be maintained and berms will be established to prevent migration of material. Please refer to added mitigation measures HAZ-1A, HAZ-1B, HAZ-2, and HAZ-3.
15. Comment noted. Please refer to response to comment #7 and mitigation measures HAZ-2, HAZ-3A, and HAZ-3B.
16. Comment noted. Please refer to added mitigation measures HAZ-1A, HAZ-1B, HAZ-2, HAZ-3A, HAZ-3B, and HAZ-3C.
17. Comment noted. Please refer to response to comments received from CDF/County Fire.
18. Comment noted. The EIR adequately analyzed the traffic safety hazards due to the increase of tanker truck traffic and the use of local streets for access to US 101, and also adequately analyzed the health risks associated with the project. Mitigation has been

developed to reduce impacts to less than significant levels. Please refer to response to comments received from CDF/County Fire.

RESPONSES TO COMMENTS FROM MR. & MRS. CARMEN R. PORCO

March 23, 2004

1. Comment noted. Hydrogen Sulfide is naturally occurring at the oilfield; however, "Fumes" may include fugitive hydrocarbons leaking from well heads and other equipment, and odors. Fugitive hydrocarbons are currently controlled by a quarterly monitoring program using hand-held instruments to detect odors and target maintenance actions to repair leaks. The proposed facilities would be included in this program as required by APCD Rule 417. The project area has a history of odor complaints, and the EIR has been revised to consider the proposed increase in oil production with respect to odors and public nuisance. The California Division of Oil, Gas and Geothermal Resources (DOGGR) inspects blow-out prevention equipment (BOPE) at each oil well prior to initial drilling or subsequent well modifications or maintenance activities. Such inspects ensure that the prevention equipment is operating properly to minimize the risk of a well blow-out. Furthermore, as shown in Figure 10-1, the oilfield is operated in a negative balance, whereby the total fluid injected is less than the total fluid produced, thereby reducing the internal reservoir pressure. As such, this will reduce the likelihood of natural emissions of natural gas (TOC and H_2S).
2. There is naturally occurring seepage of oil within the Price Canyon oilfield. Furthermore, there may be some ground contamination at existing wells. See response to comment #9 from Mr. Rudy Natoli. Also, California Code of Regulations, Title 27 for treatment, storage or disposal on land of waste materials applies to the project. For instance, waste piles or processing areas of petroleum contaminated soils, tank bottoms removed from tanks and abrasive grits placed on the land (including on paved surfaces) would be subject to Title 27 requirements. In addition, any hazardous wastes generated at the facility would be subject to the California Code of Regulations Titles 22 and 23, which regulate the storage and management of hazardous waste.
3. See response to comment #4 from Rudy Natoli.
4. Comment noted. The EIR identified two potential significant visual impacts. These include: (1) removal of mature coast live oaks and several Well's manzanita, which may reduce the visual quality of the project area, and (2) Wells drilled on new pads would increase the number of wells visible on the property. Mitigation measures to minimize these impacts have been identified and incorporated into the EIR. See Mitigation Measure AES-3.
5. Recommended mitigation for proposed steam generator emissions includes payment to an emissions reduction fund, completion of a health risk assessment and implementation of additional emissions controls to reduce health risk (if indicated by the health risk assessment). The purpose of the emissions reduction fund is to offset project-related emissions on a regional basis through diesel bus conversions to natural gas, agricultural engine replacement and similar programs.
6. Comment noted. Please refer to response to comments received from CDF/County Fire. (Refer to Air Quality Response to Comments)

7. The proposed project would result in an increase in air emissions from hydrocarbon leaks and steam generators. However, these emissions would be reduced to the extent feasible, and residual emissions would be offset on a regional basis through payment to the APCD's emissions reduction fund.

8. Odors or any other evidence of excessive emissions should be reported to the APCD, which is mandated by State law to investigate public nuisance complaints regarding dust, odors and other air emissions. Refer to response to comment #1.

9. Comment noted. The EIR adequately analyzed cumulative impacts associated with the project. The Los Robles 312 unit housing development planned for the area near Oak Park Blvd and Old Oak is of considerably distance and was not included as part of the cumulative analysis. Furthermore, projects within the City of Arroyo Grande city limits are of greater distance to not necessitate consideration.

10. Comment noted. The EIR adequately addressed impacts associated with the proposed expansion of the oilfield. The project site lies within the Energy Extractive Combining Designation and the proposed project is consistent with this. Any proposed residential development adjacent to this Combining Designation should consider its consistency with this. The proposed project will not encroach upon new land, but rather intensify existing operations within the oilfield boundary.

11. Comment noted. The project will generate considerable economic benefit to the County of San Luis Obispo. Upon completion of operations of the facility, a plan to restore the site for long-term productivity will be implemented.

12. The proposed project will require permits from the APCD, which will include a comprehensive evaluation of the emissions, compliance with rules and implementation of Best Available Control Technology. On-site monitoring currently occurs by APCD enforcement staff and would be continued as needed to determine compliance with APCD permits, APCD Rules and to investigate odor complaints.

13. Comment noted. Please refer to response to comments received from CDF/County Fire.

14. See response to comment #4 from Rudy Natoli. A detailed human health risk assessment would be completed by the APCD as part of permitting the proposed Phase IV expansion. Additional emissions controls or other restrictions would be required if the estimated health risk exceeds the APCD threshold. Emissions and odors may be reported to the APCD, a specific "hotline" is not necessary.

15. Comment noted. The EIR was released to the public for a 45-Day public comment period pursuant to the California Environmental Quality Act, which is of sufficient duration to allow time for citizens to offer their comments. There is no need to extend the comment period. The availability of the Draft EIR was noticed in a public newspaper and surrounding property owners will be notified of the public hearing.

RESPONSES TO COMMENTS FROM PLAINS EXPLORATION AND PRODUCTION, MR. KURT KOERNER

March 26, 2004

1. Comment noted. Section 2.1 has been modified to reflect this.

2. Comment noted. Section 2.1, paragraph 3 has been modified to include the additional language.
3. Comment noted. Section 2.1 has been modified to reflect comment #2, no other comparisons between the 1994 EIR and this EIR are necessary.
4. Comment noted.
5. Comment noted. Section 3.5.3 has been modified to reflect this.
6. Comment noted. Construction equipment estimates, including load factors and usage, utilized for the air quality analysis reflect careful review of the proposed project and discussions with the APCD and County of San Luis Obispo.
7. Comment noted. Project trip generation estimates were based on a worst-case scenario.
8. Comment noted. The requirement for 15-gallon replacement oak trees has been replaced with 1-gallon oak trees.
9. Comment noted. The measure has been modified to require planting to occur in the fall season upon completion of grading within a give area.
10. We have been unable to find application-specific load factors for engines used for oil well drilling; therefore, these values remain unchanged in the Final EIR. However, we recognize the cyclic load of the draw-works engine, such that the assumed load factor of 75 percent may be too high. In the absence of any other information, the EIR has been revised to reflect a load factor of 50 percent for the draw-works engine.

    Emission factors for construction and well drilling equipment are based on emissions testing with pre-1993 diesel fuel. The proposed project would utilize diesel fuel certified by the ARB, with lower sulfur content and lower aromatic hydrocarbon content. Therefore, these emissions have been re-calculated assuming use of ARB-certified diesel fuel, and would reduce NOx emissions by 6 percent and PM emissions by 20 percent. These values are taken from The Carl Moyer Memorial Air Quality Standards Attainment Program Guidelines, revised September 2003.

    The suggested mitigation measure to restrict simultaneous activities, such that well drilling cannot occur at the same time as well pad and pipeline construction has been added to the EIR.
11. The ARB does not manage a certification program for emission controls for portable engines, such as those used for well drilling. These engines are regulated through the Statewide Portable Equipment Registration Program. Mitigation Measure AQ-1 has been revised to include a number of alternative technologies to reduce emissions from construction and well drilling equipment, to allow greater flexibility in reducing emissions.
12. The EIR has been revised to delete scraper-related emissions. However, fugitive dust emissions caused by wind erosion of exposed soils has not been modified. The 3 acre estimate of well pad construction assumes this area is subject to wind erosion, and not necessarily under construction. Wind erosion continues following grading until the well pad is paved or vegetation becomes established.

13. The EIR has been revised to delete the estimate of post-mitigation emissions (0.65 tons NOx per well) since this value will be based on the ultimate emissions control implemented.

14. The EIR must include all feasible mitigation measures to reduce project emissions, and cannot rely on future unknown actions by the APCD. Please note that offsetting construction emissions (Mitigation Measure AQ-2.A of the Draft EIR) is required by the County under CEQA and not APCD Rules.

15. *California Implementation Guidelines for Estimating Mass Emissions of Fugitive Hydrocarbon Leaks at Petroleum Facilities* (CAPCOA & CARB, 1999) provides a correlation method to estimate fugitive hydrocarbon emissions based on leak monitoring data. However, sufficient information to calculate emissions (e.g., monitoring data, component counts, service type, etc.) has not been provided to date. Therefore, the EIR relies on the "per well" calculation methodology.

16. Comment noted. Mitigation Measure BIO-3 has been revised as recommended. Please refer to page 5.5-32.

17. Please refer to response to comments received from CDF/County Fire. Also, please refer to response to comments #8 and 9.

18. Comments noted. As suggested, Threshold of Significance 3 has been deleted from Mitigation Measure BIO-6 as it does not apply (see page 5.5-40). However, for clarification; Mitigation Measures BIO-3 and BIO-5 address short-term, direct impacts to special-status species and sensitive plant communities during the Phase IV implementation phase. Mitigation Measure BIO-6 is intended to address potential long-term loss and further degradation and/or fragmentation of sensitive plant communities supporting special-status species from ongoing operation of the facility through dedication of a protected open space easement for replacement planting and long-term preservation (see revision 10 page 5.5-38). Loss of non-native annual grassland and coyote brush scrub are not considered significant impacts (see revisions to pages 5.5-39 and 5.5-40).

19. Comment noted. See revisions to Mitigation Measure Bio-6, Provision A, page 5.5-40.

20. Comment noted. Mitigation Measure CUL-2 has been modified to allow PXP this flexibility.

21. Comment noted. Mitigation Measure PAL-1 has been modified to allow PXP this flexibility.

22. Comment noted. Such recognition has been noted in Section 5.9.2.2.

23. Comment noted. Mitigation Measure NOS-2 has been modified to reflect this.

RESPONSES TO COMMENTS FROM MS. RACHEL KOVESDI, KING VENTURES

March 26, 2004

1. Comment noted. An extensive visual analysis from both Price Canyon Road and surrounding residential land uses is not warranted. Furthermore, the characterization of "only an incremental expansion" does not need to be removed. This project represents Phase IV of a Master Plan Development for the Price Canyon oilfield. The project analyzed in the previous EIR of 1994 analyzed a total disturbance of approximately 10 acres for new well pad construction, whereas this EIR only analyzed 2 acres of disturbance due to new

well pad construction. This project will increase the intensity of production within the Phase III boundary, but is still only an incremental expansion of the existing oil field operation.

2. Comment noted. There is no need to require PXP to submit the plan for preserving the long-term productivity of the site as well as site restoration immediately. It is reasonable to require this plan to be submitted as a condition of approval. Such timing does not result in the County ceding the opportunity to review and modify the plan as an integral part of the expansion proposal. The County will be not issue the Conditional Use Permit for the project until all requirements have been met.
3. This project will result in an additional 25 tanker truck trips per day. The EIR includes mitigation requiring that trucks (delivery, hauling and transportation trucks) be scheduled outside the A.M. and P.M. peak period (7:00 to 9:00 A.M. and 4:00 to 6:00 P.M.) to the extent feasible to minimize safety issues. No further mitigation is required.
4. See response to comment #4 from Rudy Natoli. However, a detailed health risk assessment would be completed as part of permitting by the APCD, and would include specific measures to reduce emissions and health risk, such as additional control devices, facility siting or limitations on operation.
5. This project is not a new or major addition to a fossil fuel facility, but rather an incremental expansion to an existing field. Section 5.10 contains a review of the existing safety measures implemented at the project site. This Section along with the EIR were reviewed by the County of San Luis Obispo and CDF/San Luis Obispo County Fire Department. Refer to the responses to their comments.
6. See response to comment #9 from Rudy Natoli.
7. To the extent feasible, new well pads have been sited in swales, other natural depressions, or behind existing trees and shrubs. An alternative site to well pad Maino 16NW is not feasible is due to the relatively shallow (i.e., ~1,500-foot) depths of production in the field, which restricts the vertical distance to directionally drill within acceptable limits on “inclination“ and “dog leg severity” to place the bottom hole location where it is needed. The field is produced with wells configured in patterns of approximately 1 ¼-acre in size. To reach the bottom hole locations required for the patterns to be developed in this portion of the field, the Maino 16NW pad is the only location that will work. PXP originally planned to install up to three pads, thereby disturbing 2-3 acres, but after careful re-analysis of the well locations, and drilling/production facility layouts, reduced it to only one pad in this location to minimize impacts. The well pad will be constructed under the supervision of the compliance monitor and PXP will implement measures to conducting planting to screen the well pumper units at the site, including measures AES-3 and BIO-6.
8. See previous comment. The EIR contains measures requiring landscaping to effectively screen new components from Price Canyon Road.
9. Please refer to response to comments from CDF/San Luis Obispo County Fire Department.
10. Please refer to response to comments from CDF/San Luis Obispo County Fire Department.
11. See response to comment #4 from Mr. Rudy Natoli.

12. Comment noted. The EIR includes appropriate mitigation to minimize impacts associated with tanker truck traffic on Price Canyon Road and into Pismo Beach. As a condition of approval, no haul trips will occur during peak AM and PM periods (7:00 AM – 9:00 AM and 4:00 to 6:00 PM) Monday through Friday. Therefore, the additional 25 haul truck trips per day will not result in a significant impact. Furthermore, the City of Pismo Beach plans to modify Price Canyon Road so that it connects directly with Five Cities Drive, which would enable tanker trucks to bypass downtown Pismo Beach.

13. Comment noted. Please refer to response to comment #23. The proposed new facilities will either be hidden from view or sufficiently screened to minimize impacts. No further mitigation is required. See measure AES-3.

14. Alternative locations for the steam generators are not required under CEQA because significant impacts have been mitigated. Locations A and B both contain existing steam generators; the new generators would be installed next to these. Installing new steam generators at new locations would require construction of piping and associated equipment, which would result in greater impacts to visual resources.

15. Please refer to response to comment #7.

16. The Clean Air Plan is based on the effect of control measures on future emissions projections. The emission projections are based on activity factors, primarily population growth. The proposed project would not induce population growth, and does not require a consistency analysis according to the CEQA Air Quality Handbook. In addition, the County was re-designated an ozone attainment area in January 2004, such that the Clean Air Plan has achieved its primary goal and consistency with the Plan becomes less relevant. Therefore, Clean Air Plan consistency analysis has not been included in the EIR. Subsequent approvals will be required by the SLO APCD.

17. The EIR provides mitigation measures to reduce project emissions to the extent feasible, including numerous on-site measures. Post-mitigation NOx emissions would remain significant and require off-site mitigation in the form of a regional program. It is true that these excess NOx emissions would be mitigated on a regional basis and local ambient NOx concentrations may increase. However, NOx concentrations in the region are very low and the primary air quality concern is the photochemical formation of ozone, which generally involves NOx. Since ozone is a regional pollutant formed in the atmosphere at some distance from the NOx source, regional mitigation for excess NOx emissions is considered appropriate.

    The proposed facilities would require permits from the APCD, and may include emissions offsets to prevent a net increase in emissions.

    See response to comment #4 from Rudy Natoli. A detailed health risk assessment would be completed as part of permitting by the APCD, and would include specific measures to reduce emissions and health risk, such as additional control devices, facility siting or limitations on operation. A detailed risk assessment was not completed as part of the EIR because precise details regarding equipment specifications, operating scenarios, control devices, emissions offsets and BACT determination would be developed during the APCD permitting process and are not fully known at this time. Complex air dispersion modeling

and exposure assessment conducted as part of the risk assessment relies on these details, and may yield false conclusions in the absence of such information.

18. See the response to Comment #17.

19. Comments noted. Please refer to Impact BIO-3 and BIO-4 (pages 5.5-30 through 5.5-35) for an evaluation of potential impacts to these species. Please also note that the Calif. Dept. of Fish & Game was consulted during the development of impact discussions and mitigation requirements of the Draft EIR and received a copy of the draft EIR during the public review period.

    Of the species outlined in Comment #19, the Calif. red-legged frog (CRLF) is the only federally listed species protected under Section 9 of the Endangered Species Act. Well pads located within 250 feet of Pismo Creek (known CRLF habitat) include Signal 113 D and Signal 151. Mitigation Measure BIO-4 prohibits construction (e.g., clearing and grubbing of vegetation, rough grading, drilling, etc.) of any area within a buffer zone of 100 feet from both sides of Pismo Creek's banks (San Luis Obispo County Land Use Ordinance 22.07.166). Implementation of BIO-4 is intended to eliminate potential project impacts to the riparian corridor of Pismo Creek and associated special-status species. Additionally, Mitigation Measure BIO-3 (page 5.5-32 through 5.5-33), also requires a qualified biologist to conduct pre-activity surveys to determine the location and extent of all special-status species occurring within and adjacent to individual well pads prior to construction/development of well pads, including Signal 113 D and Signal 151. As such, "take" of federally listed species associated with the Pismo Creek riparian corridor is not expected with implementation of Mitigation Measures BIO-3 and BIO-4. Lastly, as a responsible agency, the U.S. Fish & Wildlife Service received a copy of the Draft EIR during the public review period.

20. Please refer pages 5.5-24 through 5.5-25 and 5.5-29 for a discussion of potential impacts to these species, in addition to response #19 above.

    Please also note that none of the bird species highlighted in Comment #20 are listed as either threatened or endangered under the federal Endangered Species Act. However, Mitigation Measure BIO-2 (page 5.5.-29) requires that construction and drilling operations be conducted prior to the initiation of nesting, or after the completion of nesting to avoid any potential impact to migratory birds. If deemed infeasible, then Mitigation Measure BIO-2 requires pre-construction surveys to be conducted between February 15 and August 15 to identify potential bird and raptor nesting sites for avoidance. As such, impacts to nesting birds are not expected with implementation of Mitigation Measure BIO-2. Lastly, as a responsible agency, the U.S. Fish & Wildlife Service received a copy of the Draft EIR during the public review period.

21. Please refer pages 5.5-30 through 5.5-33 for a discussion of potential impacts to these species, in addition to response #19 above.

    Of the plant species highlighted in Comment #21, impacts are expected to occur to Pismo clarkia and Well's manzanita due to project implementation. As such, Mitigation Measures BIO-3 (page 5.5-32) and BIO-6 (page 5.5-40) were developed to fully mitigate potential impacts to these species which includes dedication of a permanent open space easement. Exact specifications of the mitigation for special-status plant species, including the open

space easement were discussed in a meeting held with Deb Hillyard of the Calif. Department of Fish & Game on Nov. 25, 2003. Further, as a responsible agency, the U.S. Fish & Wildlife Service received a copy of the Draft EIR during the public review period.

22. Please refer to response 19 above.

23. Comments noted. It has been shown that 1-gallon trees have a higher survivability rate than 15-gallon trees and will afford better screening in the long-term. Both CDF and CDFG concur with this. Please refer to CDF/County Fire Dept. Response #2, Plains Exploration & Production Company Response #8 and #9, and Comment #19 listed above. Also, please note that Mitigation Measure BIO-5 was revised as suggested to reflect replanting of dead replacement oaks identified during the monitoring period (see page 5.5-38).

    As discussed above, a meeting was held with Deb Hillyard of the Calif. Department of Fish & Game on Nov. 25, 2003 to discuss the project and adequacy of proposed mitigation measures including those pertaining to oak tree impacts (i.e., replacement ratios, etc.).

    Please refer to King Ventures, Response #7 for an evaluation of alternative well pads for Maino 16NW, Signal 66C, and Signal 113D.

24. Comments noted. Please refer to Responses #19 through #23, above.

    Also please note that proposed new well pad locations and those proposed for modification/expansion were selected with the intent of maximizing productivity of the oil field while minimizing potential impacts to the environment per the provisions of the Specific Plan for facility operations. However, as recommended in Mitigation Measures BIO-3 and BIO-5, pads Signal 66C and 133A shall be realigned and further reduced in size to avoid and/or minimize potential impacts to Well's manzanita and coast live oak woodland (see pages 5.5-32 and 5.5-37) identified during the field surveys and biological resources impact analysis. Additionally, please refer to King Ventures, Response #7 for further evaluation of alternative well pads.

25. Comment noted.

26. Comment noted. The RWQCB has reviewed the EIR and provided comments. See Mitigation Measures GEO-2 and GEO-3. The RWQCB is designated as a responsible agency for this project and will ensure that appropriate permits under its jurisdiction have been obtained by PXP prior to initiation of project activities.

27. Comment noted. Mitigation Measure PAL-1 has been modified to reflect this comment.

28. Comment noted.

29. Comment noted. Please refer to response to comments from CDF/County Fire.

30. Comment noted. The HAZ-1 impact level of significant has been changed to a Class II impact and appropriate mitigation as suggested by CDF//County Fire has been added. Please refer to 5.10-6.

31. Comment noted. Additional mitigation measures have been included for impact HAZ-2 as suggested by CDF/County Fire. Please refer to 5.10-6.

32. Comment noted. The HAZ-3 impact level has been changed to a Class II impact and appropriate mitigation as suggested by CDF/County Fire has been added. Please refer to page 5.10-6.

33. Comment noted. Additional mitigation measures have been included in impact HAZ-2 as suggested by CDF/County Fire. Please refer to page 5.10-8.

34. Please refer to response to comments from CDF/County Fire.

35. Please refer to response to comments from CDF/County Fire.

36. Please refer to response to comments from CDF/County Fire. The primary concern with impacts to Public Services is the effect to emergency response. Such issue has been addressed in Section 5.10 and in the response to comments from CDF/County Fire.

RESPONSES TO COMMENTS FROM SAN LUIS OBISPO COUNTY AIR POLLUTION CONTROL DISTRICT

March 26, 2004

1. The requested text change has been completed.

2. The EIR has been revised to reflect the recent change in County attainment status.

3. The EIR has been revised to note the Air Quality Handbook has been updated.

4. The EIR has been revised to more clearly state the APCD's CEQA thresholds.

5. PM10 emissions from diesel fuel combustion is presented in Table 5.4-3 under equipment and motor vehicles. A discussion of diesel PM as a toxic air contaminant has been added to the EIR.

6. The project site is located within the Pismo Formation, a sedimentary geologic unit, which is not expected to include ultramafic or asbestos-containing materials. According to the County Geologist, the potential for encountering asbestos-containing materials is very low.

7. A brief discussion of the Statewide Portable Equipment Registration Program has been included in the EIR.

8. Construction-related motor vehicle emissions are quantified in Table 5.4-3 of the EIR.

9. The manufacturer (Cleaire Advanced Emission Controls: www.cleaire.com) states that the Longview system reduces NOx by 25 percent and ROG by 65 percent.

10. The requirement for truck washing/rumble pads has been added to the dust control measures of the EIR.

11. Mitigation Measure AQ-1 of the EIR has been modified to provide more flexibility in the emission controls that may be implemented to reduce construction emissions to the extent feasible. A monitoring and reporting plan has been added to facilitate verification by the County.

12. The EIR has been revised to delete the estimate of post-mitigation emissions (0.65 tons NOx per well) since this value will be based on the ultimate emissions control implemented.

13. The steam generator emissions were calculated based on compliance with APCD Rule 430, it is possible that post-BACT emissions would be lower, such that the EIR may be considered conservative.

14. Emissions from increased tanker truck trips have been estimated and added to the EIR.

15. Tanker truck loading emissions have been calculated using emission factors from Section 5.2 of Compilation of Air Pollutant Emission Factors (EPA, 1995), based on submerged loading and use of the existing vapor recovery system. Assuming heavy crude oil at 100oF, 95 percent vapor destruction efficiency, 70 percent vapor collection efficiency, and 130,200 gallons per day, emissions would be 0.04 pounds ROG per day. This value is considered negligible.

16. California Implementation Guidelines for Estimating Mass Emissions of Fugitive Hydrocarbon Leaks at Petroleum Facilities (CAPCOA & CARB, 1999) provides a correlation method to estimate fugitive hydrocarbon emissions based on leak monitoring data. This calculation method has been suggested by the applicant. However, sufficient information to calculate emissions (e.g., monitoring data, component counts, service type, etc.) has not been provided to date. Therefore, the EIR relies on the "per well" calculation methodology.

17. The EIR has been revised to include sulfur compounds in the human health risk assessment.

18. A discussion of the potential for the proposed project to violate Rule 402 has been added to the EIR, including mitigation in the form of the development and implementation of an Odor Monitoring and Complaint Response Plan.

19. Many of the mitigation measures listed are requirements of existing District rules and State law. Implementation of these measures would be mandatory, regardless of the alternative selected. The EIR has been revised to clarify this issue.

RESPONSES TO COMMENTS FROM CDF/SAN LUIS OBISPO COUNTY FIRE DEPARTMENT

March 26, 2004

1. Comment noted. CDF/San Luis Obispo County Fire Department has been added to the list of responsible agencies.

2. Comment Noted. Mitigation Measure BIO-5 has been revised to include the use of seedlings and 1-gallon stock for all oak tree replacement planting within the oil field. Please refer to page 5.5-39.

3. Comment noted. Mitigation Measure BIO-5 has been revised to include specific language recommending the use of local oak leaf/litter/mulch so that the newly planted seedlings and 1-gallon container stock are exposed to local mycorrhizal fungi to enhance survivability and growth. Please refer to page 5.5-39.

4. Comment Noted. The HAZ-1 impact level has been changed to a Class II impact and appropriate mitigation as suggested by CDF/County Fire has been added. Please refer to page 5.10-7.

5. Comment noted. Additional mitigation measures have been included in impact HAZ-2 as suggested by CDF/ County Fire. Please refer to page 5.10-8.
6. Comment noted. The HAZ-3 impact level has been changed to a Class II impact and appropriate mitigation as suggested by CDF/ County Fire has been added. Please refer to page 5.10-9.
7. Comment noted. The HAZ-5 impact level has been changed to a Class II impact and appropriate mitigation as suggested by CDF/ County Fire has been added. Please refer to page 5.10-10.
8. Comment noted. Policy 52 has been changed so that it says "3 miles from Pismo Beach."
9. Comment noted. The following has been added "Such expansion will include construction of new oil wells, steam generators and pipelines." The response time of the Airport Fire Station has been added, as well as the arrangement between the City and CDF. The following has also been added, "Although the facility is not within a 5-minute response time, the project does not involve construction of a new facility, but rather construction of new components of an existing facility." The project is consistent with Policy 58, which states that expansion of existing facilities shall take priority over opening up additional areas or the construction of new facilities. The proposed project will take place entirely within the Phase III Boundary and will not result in the opening up of additional areas.
10. Refer to comment 6 above.
11. Refer to comment 6 above.
12. Comment noted. The proposed project is an expansion of an existing oil field. The proposed project does not create a new petroleum facility as discussed in Policy 64, Guideline 64.2.
13. Comment noted. The existing Level of Service for the Price Street/Hinds Avenue intersection is rated at "B'", based on the traffic study for the Stimson Street Residential Project (ATE 2002). As a condition of approval, no increase in haul trips will occur during peak AM and PM periods (7:00 AM – 9:00 AM and 4:00 to 6:00 PM) Monday through Friday. Therefore, the additional 25 haul truck trips per day will not result in a significant impact. Furthermore, the City of Pismo Beach plans to modify Price Canyon Road so that it connects directly with Five Cities Drive, which would enable tanker trucks to bypass downtown Pismo Beach, thereby minimizing any impacts.
14. Comment noted. Reference has been changed in Section 10.
15. Comment noted. Please review to new mitigation measures HAZ-3A, HAZ-3B, and HAZ-3C.

RESPONSES TO COMMENTS FROM CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD – CENTRAL COAST REGION

March 26, 2004

1. Comment noted. PXP will comply with the requirements under a general stormwater construction permit, which may be required by the RWQCB for the project. Such requirements may include preparation of a Storm Water Pollution Prevention Plan (SWPPP).

The SWPPP would include provisions for the installation and maintenance of Best Management Practices to reduce the potential for erosion of disturbed soils at the Project site.

2. Comment noted. PXP will comply with all necessary requirements imposed by RWQCB pursuant to their authority and jurisdiction.
3. Comment noted. Figure 4-4 has been modified to show a 100-foot buffer for the riparian drainage similar to the one shown for Pismo Creek. However, Morehouse 303 and Signal 151 will be required to adhere to a 50-foot buffer, per requirements identified in Impact BIO-4 (see page 5.5-33).
4. Comment noted. Please refer to corrections of page 5.10-3.
5. Comment noted. Please refer to response to comments from CDF/County Fire.

RESPONSES TO COMMENTS FROM DENNIS J. O'BRYANT, CALIFORNIA DEPARTMENT OF CONSERVATION

March 17, 2004

1. Comment noted. The proposed project will take place entirely within the Phase III Boundary, which was previously analyzed in the 1994 EIR. This area is an active oilfield, and oil production operations are currently occurring within this boundary. No activities are proposed outside of this area; therefore, no impacts to agricultural resources will occur from operations. The prime soils (III non-irrigated, II irrigated) located near the oilfield lie to the south (downstream) of the Phase IV project area. They will not be impacted by this project.
2. Comment noted. According to review of County of San Luis Obispo parcel date, the project will not affect any land under a Williamson Act Contract.
3. Comment noted. According to review of County of San Luis Obispo parcel date, the project will not affect any land under a Williamson Act Contract.

RESPONSES TO COMMENTS FROM WILLIAM E. BRANNON, CALIFORNIA DEPARTMENT OF CONSERVATION, DIVISION OF OIL, GASS AND GEOTHERMAL RESOURCES

May 17, 2004 – First Letter

1. Comment noted. Please refer to corrections of page 5.10-1.
2. Comment noted. DOGGR will monitor mitigation measure HAZ-2A as part of their regulatory activities.
3. Comment noted. DOGGR will monitor potential risks from critical wells (wells located in close proximity to Price Canyon Road and the UPRR railroad) as part of their well application review process.

RESPONSES TO COMMENTS FROM WILLIAM E. BRANNON, CALIFORNIA DEPARTMENT OF CONSERVATION, DIVISION OF OIL, GASS AND GEOTHERMAL RESOURCES

May 17, 2004 – Second Letter

1. Comment noted. Please refer to additional language of page 5.10-4.
2. Comment noted.

3. Comment noted. Please refer to new mitigation measure HAZ-1C and revised measure HAZ-4
4. Comment noted. Please refer to new mitigation measure HAZ-1D

CHAPTER 10.0
REFERENCES

3.0 PROJECT DESCRIPTION

County of San Luis Obispo. 1981. *Final Environmental Impact Report. Arroyo Grande Thermal Project.* Prepared by Energy Resources Company, Incorporated. La Jolla, CA.

County of San Luis Obispo. 1994. *Final Supplemental Environmental Impact Report. Shell Western Development Plan*. Prepared by Science Applications International Corporation. Santa Barbara, CA.

Koerner, Kurt. Comments on Project Description. Central California Asset Manager. Plains Exploration and Production Company. San Luis Obispo, CA.

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