DRAFT
ENVIRONMENTAL IMPACT REPORT
ENVIRONMENTAL IMPACT STATEMENT

PROPOSED CELERON / ALL AMERICAN AND GETTY PIPELINE PROJECTS

CALIFORNIA STATE LANDS COMMISSION
AND
BUREAU OF LAND MANAGEMENT
DEPARTMENT OF THE INTERIOR

State Clearing House No. 83110902
Contract No. R-8353

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ENVIRONMENTAL RESEARCH & TECHNOLOGY, INC.
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AUGUST 1984

CALIFORNIA STATE LANDS COMMISSION AND
BUREAU OF LAND MANAGEMENT, DEPARTMENT OF THE INTERIOR

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ENVIRONMENTAL IMPACT REPORT/ENVIRONMENTAL IMPACT STATEMENT FOR THE CELERON/ALL AMERICAN AND GETTY PIPELINE PROJECTS

Prepared by

ENVIRONMENTAL RESEARCH & TECHNOLOGY, INC.

Prepared for

STATE LANDS COMMISSION AND BUREAU OF LAND MANAGEMENT

August 1984

Claire Dedrick, Executive Officer, State Lands Commission

Edward Hastey, California State Director, Bureau of Land Management

State Clearing House Number 83110902
Contract Number R 8353

STATE OF CALIFORNIA

GEORGE DEUKMEJIAN, *Governor*

STATE LANDS COMMISSION

KENNETH CORY, *Controller*
LEO T. McCARTHY, *Lieutenant Governor*
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EXECUTIVE OFFICE
1807 - 13th Street
Sacramento, California 95814

CLAIRE T. DEDRICK
Executive Officer

File: W 30031

July 17, 1984

NOTICE OF COMPLETION/PUBLIC HEARING
ON A DRAFT JOINT ENVIRONMENTAL IMPACT REPORT/
ENVIRONMENTAL IMPACT STATEMENT

Pursuant to Section 15085(d), Title 14, California Administrative Code, the National Environmental Policy Act and 40 CFR 1500, this is to advise that a Draft EIR/EIS has been prepared for the State Lands Commission, Bureau of Land Management, and Santa Barbara County Resource Management Department, for the proposed project described below:

Project Title: Celeron/All American and Getty Pipeline

Project Location: Santa Barbara County to Emidio, Kern County, and then continuing to Freeport, Texas.

Project Description: Celeron/All American Pipeline Companies propose to construct a 1200-mile, buried pipeline to transport heated crude oil from the Santa Barbara and Santa Maria Basins through Emidio Station, California, to McCamey, Texas, with a possible 460-mile extension to Freeport, Texas.

Getty Trading and Transportation Company proposes to construct a 113-mile, buried pipeline to transport heated crude oil from Gaviota, California, to Emidio Station, California.

Contact Person: Mary Griggs Telephone: (916) 322-0354

The document is identified as SLC EIR 369, State Clearinghouse Number 83110902. A copy of the document may be obtained from:

Mary Griggs
State Lands Commission
1807 - 13th Street
Sacramento, California 95814

Bill Haigh
Bureau of Land Management
1695 Spruce Street
Riverside, California 92507

Robert Almy
Santa Barbara County
Energy Division
1226 Anacapa Street, Suite 6
Santa Barbara, California 93101

Written comments should be received by Mary Griggs at the State Lands Commission office no later than November 1, 1984.

PUBLIC HEARINGS

Public hearings on the draft document will be held at the following times and locations:

Date	Location
Tuesday, September 18, 1984 7:00 to 9:00 p.m.	City Commission Chambers Las Cruces City Hall 200 North Church Las Cruces, New Mexico 88001
Wednesday, September 19, 1984 7:00 to 9:00 p.m.	Pima County Board of Supervisors Hearing Room 111 West Congress Tucson, Arizona 85701
Thursday, September 20, 1984 7:00 to 9:00 p.m.	Maricopa County Board of Supervisors Auditorium 205 West Jefferson Phoenix, Arizona 85003
Tuesday, September 25, 1984 10:00 a.m. to 12:00 p.m. and 1:00 p.m. to close of comment period	Santa Barbara County Planning Commission Room 123 East Anapamu Street Santa Barbara, California 93101

Date	Location
7:00 p.m. to close of comment period	Ethel Pope Auditorium Santa Maria High School 901 South Broadway Santa Maria, California 93454
Monday, October 1, 1984 7:00 to 9:00 p.m.	Beale Memorial Library 1315 Truxton Avenue Bakersfield, California 93301
Tuesday, October 2, 1984 7:00 to 9:00 p.m.	Holiday Inn Crown Room C 1200 University Avenue Riverside, California 92507

Anyone interested in this matter is invited to comment on the document by written response or by personal appearance at any of the hearings. Anyone interested in testifying at any of the hearings should call (916) 322-6877 so that time can be allotted for such an appearance.

CLAIRE T. DEDRICK
Executive Officer

COVER SHEET

CELERON/ALL AMERICAN AND GETTY PIPELINE PROJECT

(X) DRAFT () FINAL

Joint Review Panel	California State Lands Commission Sacramento, CA (CEQA Lead)
	U.S. Department of the Interior Bureau of Land Management (NEPA Lead) California Desert District, Riverside, CA
	Santa Barbara County Resource Management Department Santa Barbara, CA
Cooperating Agencies	U.S. Department of Agriculture Forest Service
	U.S. Department of the Interior Fish and Wildlife Service
	California Secretary of Environmental Affairs Sacramento, CA

EIS Contact
Comments on this EIR/EIS should be directed to:
Mary Griggs
State Lands Commission
1807 - 13th Street
Sacramento, California 95814
(916) 322-0354

Date by Which Comments Must be Received: November 1, 1984

ABSTRACT

The Celeron and All American Pipeline Companies propose to construct a 1,200-mile pipeline that would transport Outer Continental Shelf and other locally produced crude oils from the Santa Barbara and Santa Maria Basins through Emidio station, CA, to McCamey, TX. The 122-mile Celeron segment would extend from Las Flores, CA to Emidio, CA and the 1,084-mile All American segment would extend from Emidio, CA to McCamey, TX; both would transport heated crude oil. Getty Trading and Transportation Company (Getty) proposes to construct a 113-mile buried pipeline that would transport heated crude oil from Getty's existing marine terminal facility at Gaviota, CA, to Emidio station, CA. The Celeron/All American pipeline proposal and the Getty pipeline proposal are not dependent upon each other. Both projects could be approved or either project could be approved independently of the other.

The Celeron/All American and Getty Pipeline Projects Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) addresses both applications to construct pipelines from the Santa Barbara coast to Emidio in Kern County. The EIR/EIS also addresses Celeron/All American's application for a pipeline from Emidio to McCamey, Texas.

The EIR/EIS analyzes the environmental effects of the proposed pipelines; pump, heating, and delivery stations; and a tank farm through construction, operation, maintenance, and abandonment. This report analyzes the impacts of the Celeron/All American and Getty Proposals and four routing alternatives that have been identified. These are the Santa Maria Canyon, Desert Plan Utility Corridor, Brenda, and McCamey to Freeport Alternatives. The Santa Maria Canyon Alternative crosses a portion of the Los Padres National Forest in Santa Barbara County; the Desert Plan Alternative is in the Mojave Desert in eastern California; the Brenda Alternative is in western Arizona near the Kofa National Wildlife Refuge; and the McCamey to Freeport Alternative extends from West Texas to the Gulf Coast. These alternatives were identified to provide optional locations for the pipelines in sensitive areas. The No Project Alternative is also analyzed.

The EIR/EIS has been prepared according to the requirements of the National Environmental Policy Act of 1969 (NEPA), the Council of Environmental Quality's regulations for implementing NEPA, effective July 30, 1979, and the California Environmental Quality Act (CEQA) as amended. Based on the issues and concerns identified during the scoping process, the EIR/EIS focuses on the impacts to river crossings, access, hydrology, restoration, employment, and oil spills.

SUMMARY

Introduction

The Celeron/All American and Getty Pipeline Projects EIR/EIS is a joint document prepared for the California State Lands Commission (SLC); U.S. Department of the Interior, Bureau of Land Management (BLM); and Santa Barbara County, California, to fulfill the requirements of the California Environmental Quality Act and the National Environmental Policy Act (NEPA), respectively. These three agencies have formed a Joint Review Panel (JRP) to direct the completion of this joint state and Federal document. The JRP is administered by SLC. The Celeron/All American and Getty Pipeline projects are not dependent upon each other and either pipeline could be approved by the agencies independently of the other. The two pipeline projects would transport Outer Continental Shelf (OCS) and other locally produced crude oil from the Santa Barbara and Santa Maria Basins to other crude oil transportation networks that serve refiners in the San Joaquin Valley, San Francisco, Los Angeles, and Gulf Coast areas. The Celeron/All American Pipeline would transport up to 300,000 barrels per day (BPD). The 1,200-mile, 24 to 30-inch pipeline would travel from the area west of Santa Barbara, California, across the Sierra Madre Mountains to the Bakersfield, California area, then to Blythe, California, and across Arizona and New Mexico to the Midland, Texas area (Map 1-1). The Getty pipeline would transport up to 400,000 BPD in a 20 to 30-inch pipeline from the area west of Santa Barbara to the Bakersfield area (about 113 miles). The two proposals have similar proposed right-of-ways from the coast to a terminal facility at Emidio, southwest of Bakersfield.

Alternatives in pipeline routing were considered. The Santa Maria Canyon route is an alternative for crossing the Sierra Madre Mountains; the Desert Plan Utility Corridor is an alternative for crossing the California portion of the Mojave Desert; the Brenda route is an alternative around the Kofa National Wildlife Refuge (NWR); and the McCamey to Freeport route is an alternative from west Texas to the Gulf Coast. Single pipeline and no project alternatives were also evaluated. Alternatives considered but eliminated from detailed analysis included transportation alternatives of marine tanker, rail, truck, and other pipeline transportation developments and an alternate route across the Sierra Madre Mountains through Tunnel Canyon.

Celeron/All American has applied for right-of-way (ROW) permits from the BLM to cross Federal land managed by the BLM, Forest Service, Fish and Wildlife Service, Air Force, and Army, and from SLC for crossing land at the Colorado River. This application also requires rulings on the compatibility for the pipeline project to cross the Kofa NWR. The applicants will also require U.S. Army Corps of Engineers 404 Permits and various county and local permits.

Getty has applied for ROW permits from the Forest Service for crossing the Los Padres National Forest (LPNF) and for a Conditional Use Permit from Santa Barbara County.

Areas of Controversy

There are two major areas of controversy for the Celeron/All American and Getty proposals--project-specific impacts and other project alternatives. Controversial impacts include the crossings of Rare II areas within the LPNF, the California Desert Conservation Area, and the Kofa NWR; losses of individuals and habitat for sensitive, threatened, and endangered species; and potential oil spills into coastal waters and major river systems.

The transportation of OCS crude oil by marine tanker versus pipeline is a controversial alternative. The primary issues against tanker transport are oil spills that could affect recreation and sensitive marine resources along the coast and the cost of transportation. Controversy surrounds the cost estimates for crude oil transport from the Santa Barbara and Santa Maria Basins. The tanker alternative was studied in detail in the Oil Transportation Plan for Santa Barbara County (ADL 1984) and other studies. This EIR/EIS has reviewed and analyzed those studies that are pertinent to the question of marine tanker transportation. The conclusion at this time is that oil can be moved to viable markets by pipeline at costs equal to or less than tankers.

Major Impact Conclusions

The Celeron/All American and Getty proposals have potential significant construction and operation impacts. Construction impacts would result primarily from the clearing, trenching, and backfilling construction activities, and by the presence and needs of the labor force. Operation impacts would result primarily from potential oil spills and leaks. Significant impacts have been analyzed in detail in Chapter 4 of this EIR/EIS and mitigation measures to be required of the applicants have been developed. The following tables summarize the significant impacts that would result from the implementation of the Celeron/All American and Getty proposals and the routing alternatives. This summary includes the committed (required) mitigation measures presented in Chapter 4; indicated numbers refer to the mitigation measures developed for each discipline as presented in Section 4.10. These tables also indicate whether impacts would still be significant following the implementation of mitigation measures (i.e., unavoidable adverse impacts).

Agency Preferred Alternative

Federal agencies are required by the Council on Environmental Quality's NEPA regulations (40 CFR 1502.14) to identify their preferred alternative for a project in the Draft and Final EISs prepared for the project. The preferred alternative is not a final agency decision; it is rather an indication of the agency's preliminary preference. The preferences identified below are those of the Federal lead agency; in the case of the LPNF, the preference was identified by the Forest Service and concurred in by the BLM.

Construction of the proposed pipelines as mitigated in this document (rather than no action) is the Federal preferred alternative for both the Getty and Celeron/All American pipelines. The Federal agencies concur with the applicants' stated need for the project (see page 1-13). The West Coast crude oil glut will only increase as productivity in the Santa Barbara Channel rises over the next decade. Refining capacity on the West Coast is not sufficient to absorb both incoming Alaskan crude and crude produced on the outer continental shelf. Transportation of the crude by pipeline not only will be less expensive than by tanker but will provide a significantly more secure means of transporting excess crude to the Gulf Coast than presently available. Environmental impacts are likely to be less than those resulting from tankering or rail transport.

The preferred alternative across the LPNF is the Santa Maria Canyon Alternative. Both pipelines would be constructed in a single ROW in order to minimize impacts. This alternative would have no impacts on National Forest campgrounds. Because the alternative avoids further planning areas, there would be no impacts on wilderness potential. Disturbance to riparian vegetation would be lowest under this alternative, and degradation of stream channels would be avoided. The Santa Maria Canyon Alternative offers the greatest potential for concealing the pipeline from public view and would have significantly better future visual conditions and Visual Quality Objectives (VQO) achievement levels than the Celeron/All American or Getty proposals.

The preferred alternative across the central Mojave Desert is the applicant's proposed route rather than the Desert Plan Utility Corridor Alternative. A pipeline route through designated corridors would be nearly twice as long (191 miles rather than 114 miles), far more expensive to construct due to its length, and would result in more significant environmental impacts. For example, the alternative would cross desert tortoise crucial habitat and an unstable slope area. Although both routes cross wilderness study areas, the area crossed by the applicant's proposal (the Palen/McCoy WSA) could be avoided by a slight realignment of the route, while no realignment is practicable around the WSA crossed by the alternative (Coxcomb Mountains). The alternative would also affect more known cultural sites and more sites considered eligible for the National Register of Historic Places.

The preferred alternative in western Arizona would be through the Kofa NWR. This route is slightly shorter than the Brenda Alternative. Environmental impacts of the two routes would be approximately equal in degree. The proposed route would be located next to the existing El Paso natural gas pipeline ROW and Southern California Edison's existing Palo Verde to Devers transmission line ROW, unlike the eastern 20 miles of the Brenda Alternative which does not follow an existing ROW. It should be noted that this recommendation is only a preliminary one; a final-decision will not be made until a ROW grant is finally issued. This grant will be subject to a finding of compatability with the management goals of Kofa NWR by the Fish and Wildlife Service.

IMPACT SUMMARY TABLE FOR THE CELERON/ALL AMERICAN PROPOSAL

	Significant Impacts	Mitigation Measure (See Section 4.10)	Effectiveness	Impact Still Significant
Air Quality				
Construction	None	NA[1]	NA	NA
Operation	None	NA	NA	NA
Geology[2]				
Construction	None	NA	NA	NA
Operation	Potential hazards and risks to pipeline due to the possible surface rupture of the South Branch Santa Ynez, San Andreas, and Garlock faults.	1, 2, & 3	Minimize potential for serious damage leading oil spills by better understanding seismic and fault risks and implementing appropriate offset, design techniques.	No
	Potential hazards and risks due to slope failures in existing slide areas (Table 4-4).	1, 2, & 3	Same as above	No
	Potential hazards and risks to pump and heater/pump stations and valves due to subsidence from fluid withdrawal at several locations in Arizona and karstic collapse at one location in west Texas.	1	Identify risk areas so that appropriate design and monitoring measures can be implemented to minimize potential impacts.	No

IMPACT SUMMARY TABLE FOR THE CELERON/ALL AMERICAN PROPOSAL

	Significant Impacts	Mitigation Measure (See Section 4.10)	Effectiveness	Impact Still Significant
Soils				
Construction[3]	None	NA	NA	NA
Operation	Oil spill impacts on sensitive soils in agricultural lands in and around southwestern Kern County, Cuyama Valley, Barstow, Blythe, Rainbow Valley, and along the Gila and Rio Grande River valleys.	See Footnote[4]	NA	Yes
Surface Water				
Construction	None	NA	NA	NA
Operation	Channel degradation could result in exposure of the pipeline and increase the possibility of an oil spill.	5	NA	Yes[5]
	Major oil spills or leaks would degrade water quality below federal and state standards. Impacts would occur at and downstream from any stream crossing (Tables 3-10 and 3-11).	See Footnote[4]	NA	Yes[5]

IMPACT SUMMARY TABLE FOR THE CELERON/ALL AMERICAN PROPOSAL

	Significant Impacts	Mitigation Measure (See Section 4.10)	Effectiveness	Impact Still Significant
<u>Groundwater</u>				
Construction	None	NA	NA	NA
Operation	Degradation of groundwater quality resulting from an oil spill in a sensitive groundwater basin; estimated 28.7 spills over a 30-year project life.[6]	6 & 7	The application of mitigation measures and standard operating procedures is assumed to reduce the probability of a spill in a sensitive groundwater basin by 50 percent.	Yes
<u>Aquatic Biology</u>				
Construction	Potential reduction in diversity and abundance of important fish species in Refugio Creek, Gaviota Creek, Colorado River, Gila River, Hot Springs Canyon Creek, Bass Canyon Creek, Rio Grande River, and the Pecos River due to fuel or lubricant spills.	8	Substantially reduce the probability and frequency of spills greater than 40 gallons reaching streams.	No

IMPACT SUMMARY TABLE FOR THE CELERON/ALL AMERICAN PROPOSAL

	Significant Impacts	Mitigation Measure (See Section 4.10)	Effectiveness	Impact Still Significant
Operation	Potential reductions in diversity and abundance of important fish species in Refugio Creek, Gaviota Creek, Colorado River, Gila River, Hot Springs Canyon Creek, Bass Canyon Creek, Rio Grande River, and the Pecos River due to a major oil spill.	See Footnote[4]	NA	Yes[5]
	Potential reductions in abundance of intertidal invertebrates, surface-feeding fish, and shore-birds in nearshore marine areas due to a major oil spill into coastal streams between Las Flores Canyon and Gaviota.	See Footnote[4]	NA	Yes[5]
<u>Terrestrial Biology</u>				
Construction	Loss of riparian woodlands.	9	Reduces acreage affected by 50 percent.	Yes
	Loss of oak woodlands.	9	Same as above	Yes
	Loss of Joshua trees.	9	Same as above	No
	Loss of ironwood washes.	9	Same as above	No

IMPACT SUMMARY TABLE FOR THE CELERON/ALL AMERICAN PROPOSAL

	Significant Impacts	Mitigation Measure (See Section 4.10)	Effectiveness	Impact Still Significant
Terrestrial Biology (continued)				
Construction	Loss of dune communities.	9	Same as above	Yes
	Loss of commercial cactus.	NA	Arizona state law protects commercial species.	No
	Construction vehicle use off ROW affecting wildlife and sensitive plants or communities.	12	Eliminates impact	No
	Open trench limits wildlife access to water, especially bighorn sheep.	13 & 18	Minimizes impact	No
	Construction activity causes raptor nest abandonment.	14	Eliminates impact	No
	Loss of individual blunt-nosed leopard lizard and kit fox, and their habitats.	15	Minimizes number affected and reduces acreage disturbed by 50 percent.	Yes
	Loss of individual desert tortoise and their habitat.	11 & 16	Minimize numbers injured	Yes

IMPACT SUMMARY TABLE FOR THE CELERON/ALL AMERICAN PROPOSAL

	Significant Impacts	Mitigation Measure (See Section 4.10)	Effectiveness	Impact Still Significant
	Loss of creosote scrub-land and vegetation productivity for long term; loss of wildlife habitat in Mojave Desert.	10 & 21	Minimize acreage affected by 50 percent.	Yes
Construction	Disturbance to bighorn sheep lambing in the Dome Rock Mountains.	18	Minimizes impact	No
	Disturbance to bighorn sheep corridor movement in the Kofa National Wildlife Refuge (NWR).	19	Minimizes impact	No
	Disturbance causing raptor nest abandonment and loss of wildlife habitat in the Muleshoe Nature Preserve.	20	Minimizes impact	No
	Loss of Comanche layia and Barstow woolly sunflower (federal candidates for listing).	NA	NA	Insufficient data
Operation	Colorado River spill affecting wetlands and Yuma clapper rail (federally listed - endangered).	17	Minimizes risk of impact	Yes
	Spill in Hot Springs Creek, AZ.	8	Minimizes risk of impact	Yes

IMPACT SUMMARY TABLE FOR THE CELERON/ALL AMERICAN PROPOSAL

	Significant Impacts	Mitigation Measure (See Section 4.10)	Effectiveness	Impact Still Significant
<u>Socioeconomics</u>				
Construction	Adequate housing does not exist within a commuting distance of 170 miles round trip between Barstow and Blythe, CA, and El Paso and Pecos, TX.	22, 23, & 24	These measures will reduce competition for housing between tourists and construction workers, centralize impacts on housing in areas which have sufficient accommodations, and/or reduce commuting distances.	No
Operation	Increase in the local tax base of Hudspeth County, TX, will be greater than 10 percent.	NA	This is a positive impact.	NA
<u>Land Use and Recreation</u>				
Construction	Not consistent with Santa Barbara County Coastal Plan:			
	--Policy 6-14, crossing of Gaviota Creek ESHA	None feasible	NA	Yes
	--Policy 6-17, crossing of Gaviota State Park	None feasible	NA	Yes
	Alteration of La Brea Canyon and Kofa NWR recreation resources.	None feasible	NA	Yes

IMPACT SUMMARY TABLE FOR THE CELERON/ALL AMERICAN PROPOSAL

	Significant Impacts	Mitigation Measure (See Section 4.10)	Effectiveness	Impact Still Significant
Land Use and Recreation (continued)				
	100-ft wide ROW disturbance within portions of Gaviota State Park and La Brea Canyon.	28	Reduce disturbance by 50 percent.	Yes
	Crossing of 3 Further Planning Areas (for potential wilderness) in Los Padres National Forest (LPNF).	None feasible	NA	Yes
	Inconsistent with Riverside County General Plan utility corridors.	26	Brings ROW into compliance with plan.	No
	Inconsistent with BLM Desert Conservation Area Plan utility corridors.	26	Brings ROW into compliance with plan.	No
	ROW would provide access to sensitive areas previously inaccessible.	25	Limits proliferation of spur roads and enhances revegetation.	No
	Pipeline would cross Palen-McCoy WSA in California.	27	Avoids WSA	No
Operation	Major spills into Coastal streams would affect beaches and water-oriented recreational opportunities.	See Footnote[4]	NA	Yes

IMPACT SUMMARY TABLE FOR THE CELERON/ALL AMERICAN PROPOSAL

	Significant Impacts	Mitigation Measure (See Section 4.10)	Effectiveness	Impact Still Significant
Transportation				
Construction	None	NA	NA	NA
Operation	None	NA	NA	NA
Cultural Resources				
Construction	Potential disturbance to at least 8 sites eligible for listing on the National Register.	30	Minimize or avoid disturbance to cultural sites.	Yes[7]
Operation	None	NA	NA	NA
Visual Resources				
Construction and Operation	Significant visual changes at 6 pump station sites and along the pipeline ROW in LPNF.	31, 32, & 33	Four pump stations will will be effectively screened and ROW width will be reduced by 50 percent.	Yes[8]
Noise				
Construction	Construction noise would exceed 60 dBA at residences along the pipeline ROW.	None practical[9]	NA	Yes
Operation	Operation noise from the Gaviota pump station would exceed 60 dBA at the Vista del Mar Union School.	34	Project-related noise reduced below 60 dBA.	No[10]

IMPACT SUMMARY TABLE FOR THE CELERON/ALL AMERICAN PROPOSAL

	Significant Impacts	Mitigation Measure (See Section 4.10)	Effectiveness	Impact Still Significant
System Safety and Reliability				
Construction	None	NA	NA	NA
Operation	None	NA	NA	NA
Oil Spill Potential				
Construction	None	NA	NA	NA
Operation	Oil spill probabilities would vary based on the volume of oil lost and the age of the pipeline. There would be the probability of 1.08 spills/year of 50 barrels or greater (based on a 20-year old pipeline).	See Footnote[11]	NA	NA
	There would be the probability of 2.58 spills of 100 barrels or greater at the Cadiz tank farm during the life of the project (30 years).	See Footnote[11]	NA	NA

[1]Not Applicable

[2]Although no significant impacts were identified, certain hazards and risks would be associated with seismicity and faulting, slope stability, subsidence, and karstic collapse.

[3]Although certain construction activities would accelerate soil erosion and deposition, and decrease productivity in certain areas, no significant impacts would occur with the implementation of sound mechanical erosion control and revegetation techniques contained in the Construction and Use (CU) Plan.

[4]Use of automatic block valves and check valves and oil spill contingency plans, as part of the project description, would substantially reduce the oil spill risk.

FOOTNOTES (Continued)

[5]Level of significance would depend upon volume of the spill, time of year, and physical characteristics of stream, and sensitivity of organisms present.

[6]Probability is based upon 0.0022 occurrence/pipeline-mile/year for a greater than 2.4 bbl spill (OWI 1978). This probability is the most conservative of several sources listed in Table 4-24.

[7]Mitigation measures may not be completely effective in avoiding significant impacts to cultural resources (see Section 4.11).

[8]Impacts still significant at 2 pump station sites and in the LPNF.

[9]Because of short duration of impacts, limitation to daytime hours for construction, and low probability of accomplishing effective mitigation for the noise of mobile construction activity, mitigation beyond standard use of equipment mufflers and similar OSHA requirements is not considered to be warranted.

[10]Project-related noise not significant; ambient noise will remain above 60 dBA.

[11]Oil spills could cause significant impacts to various resources depending on the size and location of the spill. Specific mitigation measures for oil spill impacts to sensitive resources are contained under those resources.

IMPACT SUMMARY TABLE FOR THE GETTY PROPOSAL

	Significant Impacts	Mitigation Measure (See Section 4.10)	Effectiveness	Impact Still Significant
Air Quality				
Construction	None	NA[1]	NA	NA
Operation	None	NA	NA	NA
Geology[2]				
Construction	None	NA	NA	NA
Operation	Potential hazards and risks to pipeline due to possible surface rupture of the South Branch Santa Ynez and San Andreas faults.	1, 2, & 3	Minimize potential for serious damage leading to oil spills by better understanding seismic and fault risks and implementing appropriate offset, design techniques.	No
	Potential hazards and risks to pipeline due to slope failures in existing slide areas (Table 4-4).	1, 2, & 3	Same as above	No
Soils				
Construction[3]	None	NA	NA	NA
Operation	Oil spill impacts on sensitive soils in agricultural lands of southwestern Kern County and Cuyama Valley.	See Footnote[4]	NA	Yes

IMPACT SUMMARY TABLE FOR THE GETTY PROPOSAL

	Significant Impacts	Mitigation Measure (See Section 4.10)	Effectiveness	Impact Still Significant
Surface Water				
Construction	Alteration of channel geometry would cause degradation in La Brea Creek during and after construction.	4	Minimize sediment loads and degradation due to construction activities.	Yes[5]
Operation	Channel degradation could result in exposure of the pipeline and increase the possibility of an oil spill.	5	NA	Yes[6]
	Major oil spills or leaks would degrade water quality below federal and state standards. Impacts would occur at and downstream from any stream crossing (Tables 3-10 and 3-11).	See Footnote[4]	NA	Yes[6]
Groundwater				
Construction	None	NA	NA	NA
Operation	Degradation of groundwater quality resulting from an oil spill in a sensitive groundwater basin; estimated 2.1 spills over a 30-year project life.[7]	6 & 7	The application of mitigation measures and standard operating procedures is assumed to reduce the probability of of a spill in a sensitive groundwater basin by 50 percent.	Yes

IMPACT SUMMARY TABLE FOR THE GETTY PROPOSAL

	Significant Impacts	Mitigation Measure (See Section 4.10)	Effectiveness	Impact Still Significant
<u>Aquatic Biology</u>				
Construction	Potential reductions in diversity and abundance of important fish species in Gaviota Creek due to fuel or lubricant spills.	8	Substantially reduce the probability and frequency of spills greater than 40 gallons reaching streams.	No
Operation	Potential reductions in diversity and abundance of important fish species in Gaviota Creek due to a major oil spill.	See Footnote[4]	NA	Yes[6]
	Potential reductions in diversity and abundance of intertidal invertebrates, surface-feeding fish, and shorebirds in the nearshore marine areas due to a major oil spill into Gaviota Creek.	See Footnote[4]	NA	Yes[6]
<u>Terrestrial Biology</u>				
Construction	Loss of riparian woodlands and oak woodlands.	NA	NA	Yes
	Construction vehicle use off ROW affecting wildlife and sensitive plants or communities.	12	Eliminates impact	No

IMPACT SUMMARY TABLE FOR THE GETTY PROPOSAL

	Significant Impacts	Mitigation Measure (See Section 4.10)	Effectiveness	Impact Still Significant
Terrestrial Biology (continued)				
	Open trench limiting wild-life access to La Brea Creek.	13	Minimizes impact	No
	Construction activity causes raptor nest abandon-ment.	14	Eliminates impact	No
	Loss of individual blunt-nosed lizard and kit fox, and their habitats.	15	Minimizes numbers affected and reduces acreage disturbed by 50 percent.	Yes
	Loss of Hoffman's night-shade, Refugio manzanita, and Catalina mariposa.	NA	NA	Yes
Operation	Oil spill	NA	NA	Yes
Socioeconomics				
Construction	None	NA	NA	NA
Operation	None	NA	NA	NA

IMPACT SUMMARY TABLE FOR THE GETTY PROPOSAL

	Significant Impacts	Mitigation Measure (See Section 4.10)	Effectiveness	Impact Still Significant
<u>Land Use</u>				
Construction	Not consistent with Santa Barbara County Coastal Plan:			
	--Policy 6-14, crossing of Gaviota Creek ESHA	None feasible	NA	Yes
	--Policy 6-17, crossing of Gaviota State Park	None feasible	NA	Yes
	Alteration of La Brea Canyon recreation resources.	None feasible	NA	Yes
	50-ft wide ROW disturbance within portions of Gaviota State Park and La Brea Canyon.	None feasible	NA	Yes
	Crossing of 2 Further Planning Areas (for potential wilderness) in LPNF.	None feasible	NA	Yes
Operation	Major spills into coastal streams would affect beaches and water-oriented recreational opportunities.	See Footnote[4]	NA	Yes

IMPACT SUMMARY TABLE FOR THE GETTY PROPOSAL

	Significant Impacts	Mitigation Measure (See Section 4.10)	Effectiveness	Impact Still Significant
Transportation				
Construction	None	NA	NA	NA
Operation	None	NA	NA	NA
Cultural Resources				
Construction	Potential disturbance to at least 4 sites eligible for listing on the National Register.	30	Minimize or avoid disturbance to cultural sites.	Yes[8]
Operation	None	NA	NA	NA
Visual Resources				
Construction and Operation	Significant visual changes at 2 pump station sites and along the pipeline ROW in LPNF.	31, 32	Pump stations will be effectively screened and ROW width will be reduced by 50 percent on LPNF.	Yes[9]
Noise				
Construction	Construction noise would exceed 60 dBA at residences along the pipeline ROW.	None practical[10]	NA	Yes
Operation	Operation noise from the Gaviota pump station would exceed 60 dBA at the Vista del Mar Union School.	34	Project-related noise reduced below 60 dBA.	No[11]

IMPACT SUMMARY TABLE FOR THE GETTY PROPOSAL

	Significant Impacts	Mitigation Measure (See Section 4.10)	Effectiveness	Impact Still Significant
System Safety and Reliability				
Construction	None	NA	NA	NA
Operation	None	NA	NA	NA
Oil Spill Potential				
Construction	None	NA	NA	NA
Operation	Oil spill probabilities would vary based on the volume of oil lost and the age of the pipeline. There would be the probability of 0.11 spills/year of 50 barrels or greater (based on a 20-year-old pipeline).	See Footnote[12]	NA	Yes

[1]Not Applicable.

[2]Although no significant impacts were identified, certain hazards and risks would be associated with seismicity and faulting, and slope stability.

[3]Although construction activities would accelerate soil erosion and deposition and decrease productivity in certain areas, no significant impacts would occur with the implementation of sound mechanical erosion control and revegetation techniques contained in the CU Plan.

[4]Use of automatic block valves and check valves and oil spill contingency plans, as part of the project description, would substantially reduce the oil spill risk.

[5]Impact would be significant because of multiple crossings.

FOOTNOTES (Continued)

[6]Level of significance would depend upon volume of the spill, time of year, physical characteristics of stream, and sensitivity of organisms present.

[7]Probability is based upon .0022 occurrence/pipeline-mile/year for a greater than 2.4 bbl spill (OIW 1978). This probability is the most conservative of several sources listed in Table 4-24.

[8]Mitigation measures may not be completely effective in avoiding significant impacts to cultural resources (see Section 4.11).

[9]Impacts still significant in the LPNF.

[10]Because of short duration of impacts, limitation to daytime hours for construction, and low probability of accomplishing effective mitigation for the noise of mobile construction activity, mitigation beyond standard use of equipment mufflers and similar OSHA requirements is not considered to be warranted.

[11]Project-related noise not significant; ambient noise will remain above 60 dBA.

[12]Oil spills could cause significant impacts to various resources depending on the size and location of the spill. Specific mitigation measures for oil spill impacts to sensitive resources are contained under those resources.

IMPACT SUMMARY TABLE FOR THE SANTA MARIA CANYON ALTERNATIVE

	Significant Impacts	Mitigation Measure (See Section 4.10)	Effectiveness	Impact Still Significant
<u>Air Quality</u>				
Construction	None	NA[1]	NA	NA
Operation	None	NA	NA	NA
<u>Geology</u>[2]				
Construction	None	NA	NA	NA
Operation	Potential hazards and risks to pipeline due to possible surface rupture in vicinity of the Rinconada and south Cuyama faults.	1, 2, & 3	Minimize potential for serious damage leading to oil spills by better seismic and fault risks and implementing appropriate offset, design techniques.	No
	Potential hazards and risks to pipeline due to slope failure in existing or new slide areas (Table 4-4).	1, 2, & 3	Same as above	No
<u>Soils</u>				
Construction[3]	None	NA	NA	NA

IMPACT SUMMARY TABLE FOR THE SANTA MARIA CANYON ALTERNATIVE

	Significant Impacts	Mitigation Measure (See Section 4.10)	Effectiveness	Impact Still Significant
Operation	Major oil spills or leaks would contaminate soil affecting erosion rates, water uptake, and productivity. Small areas of agricultural lands, located primarily in the Sisquoc Valley, would be the most sensitive soils.	See Footnote[4]	NA	Yes
Surface Water				
Construction	None[4]	NA	NA	NA
Operation	Channel degradation could result in exposure of the pipeline and increase the possibility of an oil spill.	5	NA	Yes[5]
	Major oil spills or leaks would degrade water quality below federal and state standards in Tepusquet Creek.[4]	See Footnote[4]	NA	Yes[5]
Groundwater				
Construction	None	NA	NA	NA
Operation	Degradation of groundwater quality resulting from an oil spill in a sensitive groundwater basin; estimated 0.03 spills over a 30-year project life.[6]	6 & 7	The application of mitigation measures and standard operating procedures is assumed to reduce the probability of a spill in a sensitive groundwater basin by 50 percent.	No

IMPACT SUMMARY TABLE FOR THE SANTA MARIA CANYON ALTERNATIVE

	Significant Impacts	Mitigation Measure (See Section 4.10)	Effectiveness	Impact Still Significant
Aquatic Biology				
Construction	None	NA	NA	NA
Operation	None	NA	NA	NA
Terrestrial Biology				
Construction	Loss of riparian vegetation and oak woodlands.	9	Reduces acreage affected by 50 percent.	Yes
	Construction vehicle use off ROW affecting wild-life and sensitive plants or communities.	12	Eliminates impact	No
	Construction activity causes raptor nest abandonment.	14	Eliminates impact	No
Operation	None	NA	NA	NA
Socioeconomics				
Construction	None	NA	NA	NA
Operation	None	NA	NA	NA
Land Use and Recreation				
Construction	None	NA	NA	NA
Operation	None	NA	NA	NA

IMPACT SUMMARY TABLE FOR THE SANTA MARIA CANYON ALTERNATIVE

	Significant Impacts	Mitigation Measure (See Section 4.10)	Effectiveness	Impact Still Significant
Transportation				
Construction	None	NA	NA	NA
Operation	None	NA	NA	NA
Cultural Resources				
Construction	None	NA	NA	NA
Operation	None	NA	NA	NA
Visual Resources				
Construction	Significant visual changes along the pipeline ROW in LPNF.	32	ROW width will be reduced by 50 percent.	Yes
Operation	None	NA	NA	NA
Noise				
Construction	Construction noise would exceed 60 dBA at residences along the pipeline ROW.	None practical[7]	NA	Yes
Operation	None	NA	NA	NA
System Safety and Reliability				
Construction	None	NA	NA	NA

IMPACT SUMMARY TABLE FOR THE SANTA MARIA CANYON ALTERNATIVE

	Significant Impacts	Mitigation Measure (See Section 4.10)	Effectiveness	Impact Still Significant
System Safety and Reliability (continued)				
Operation	None	NA	NA	NA
Oil Spill Potential				
Construction	None	NA	NA	NA
Operation	Oil spill probabilities would vary based on the volume of oil lost and the age of the pipeline. There would be the probability of 0.04 spills/year of 50 barrels or greater (based on a 20-year-old pipeline).[9]	See Footnote[8]	NA	Yes[8]

[1]Not Applicable.

[2]Although no significant impacts were identified, certain hazards and risks would be associated with seismicity and faulting, and slope stability.

[3]Although construction activities would accelerate soil erosion and deposition, and decrease productivity in certain areas, no significant impacts would occur with the implementation of sound mechanical erosion control and revegetation techniques contained in the CU Plan.

[4]Use of automatic block valves and check valves and oil spill contingency plans, as part of the project description, would substantially reduce the oil spill risk.

[5]Level of significance would depend upon volume of spill, time of year, physical characteristics of stream, and sensitivity of organisms.

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FOOTNOTE (Continued)

[6]Probability is based upon .0022 occurrence/pipeline-mile/year for a greater than 2.4 bbl spill (OIW 1978). This probability is the most conservative of several sources listed in Table 4-24.

[7]Because of short duration of impacts, limitation to daytime hours for construction, and low probability of accomplishing effective mitigation for the noise of mobile construction activity, mitigation beyond standard use of equipment mufflers and similar OSHA requirements is not considered to be warranted.

[8]Oil spills could cause significant impacts to various resources depending on the size and location of the spill. Specific mitigation measures for oil spill impacts to sensitive resources are contained under those resources.

[9]Alternative segment only; 38.5 miles long.

IMPACT SUMMARY TABLE FOR THE DESERT PLAN UTILITY CORRIDOR ALTERNATIVE

	Significant Impacts	Mitigation Measure (See Section 4.10)	Effectiveness	Impact Still Significant
Air Quality				
Construction	None	NA[1]	NA	NA
Operation	None	NA	NA	NA
Geology[2]				
Construction	None	NA	NA	NA
Operation	Potential hazards and risks to pipeline due to slope failure in existing or new slide areas (Table 4-4).	1, 2, & 3	Minimize potential for serious damage leading to oil spills by better understanding slope stability and implementing appropriate offset, design techniques.	No
Soils				
Construction[3]	None	NA	NA	NA
Operation	Major oil spills or leaks would contaminate soil affecting erosion rates, water untake, and productivity. No agricultural lands occur along this route.	See Footnote[4]	NA	Yes
Surface Water				
Construction	None	NA	NA	NA

IMPACT SUMMARY TABLE FOR THE DESERT PLAN UTILITY CORRIDOR ALTERNATIVE

	Significant Impacts	Mitigation Measure (See Section 4.10)	Effectiveness	Impact Still Significant
Surface Water (continued)				
Operation	None	NA	NA	NA
Groundwater				
Construction	None	NA	NA	NA
Operation	None	NA	NA	NA
Aquatic Biology				
Construction	None	NA	NA	NA
Operation	None	NA	NA	NA
Terrestrial Biology				
Construction	Loss of ironwood washes.	9	Reduces acreage affected by 50 percent.	Yes
	Construction activity causes raptor nest abandonment.	14	Eliminates impact	No
	Loss of individual desert tortoise and their habitat.	11 & 16	Minimizes numbers injured.	Yes
	Loss of creosote scrub-land vegetation productivity for long term; loss of wildlife habitat in Mojave Desert.	10 & 21	Reduces acreage affected by 50 percent.	Yes

IMPACT SUMMARY TABLE FOR THE DESERT PLAN UTILITY CORRIDOR ALTERNATIVE

	Significant Impacts	Mitigation Measure (See Section 4.10)	Effectiveness	Impact Still Significant
Terrestrial Biology (continued)				
Operation	None	NA	NA	NA
Socioeconomics				
Construction	Adequate housing does not exist within commuting distance (170 miles round trip) between Barstow and Blythe, CA.	22, 23, & 24	These measures will reduce competition for for housing between tourists and construction workers, centralize impacts on housing in areas which have sufficient accommodations, and/or reduce commuting distances.	No
Operation	None	NA	NA	NA
Land Use and Recreation				
Construction	The Coxcomb WSA would be crossed by the proposed route and this would adversely affect wilderness values.	None feasible	NA	Yes
	ROW would provide access to a BLM Area of Critical Environmental Concern near Granite Pass.	29	Pipeline would avoid protected areas.	No

IMPACT SUMMARY TABLE FOR THE DESERT PLAN UTILITY CORRIDOR ALTERNATIVE

	Significant Impacts	Mitigation Measure (See Section 4.10)	Effectiveness	Impact Still Significant
Land Use and Recreation (continued)				
Operation	None	NA	NA	NA
Transportation				
Construction	None	NA	NA	NA
Operation	None	NA	NA	NA
Cultural Resources				
Construction	Potential disturbance to at least 3 sites eligible for listing on the National Register.	30	Minimize or avoid disturbance to cultural sites.	Yes[5]
Operation	None	NA	NA	NA
Visual Resources				
Construction and Operation	Significant visual change at Essex tank farm and heating/pumping station.	31	Tank farm will be effectively screened.	No
Noise				
Construction	None	NA	NA	NA
Operation	None	NA	NA	NA

IMPACT SUMMARY TABLE FOR THE DESERT PLAN UTILITY CORRIDOR ALTERNATIVE

	Significant Impacts	Mitigation Measure (See Section 4.10)	Effectiveness	Impact Still Significant
<u>System Safety and Reliability</u>				
Construction	None	NA	NA	NA
Operation	None	NA	NA	NA
<u>Oil Spill Potential</u>				
Construction	None	NA	NA	NA
Operation	Oil spill probabilities would vary based on the volume of oil lost and the age of the pipeline. There would be the probability of 0.17 spills/year of 50 barrels or greater (based on a 20-year-old pipeline).[7] There would be the probability of 2.58 spills of 100 barrels or greater at the Essex tank farm during the life of the project (30 years).	See Footnote[6]	NA	Yes[6]

[1]Not Applicable.

[2]Although no significant impacts were identified, certain hazards and risks would be associated with slope stability.

FOOTNOTE (Continued)

[3]Although construction activities would accelerate soil erosion and deposition, and decrease productivity in certain areas, no significant impacts would occur with the implementation of sound mechanical erosion control and revegetation techniques contained in the CU Plan.

[4]Use of automatic block valves and check valves and oil spill contingency plans, as part of the project description, would substantially reduce the oil spill risk.

[5]Mitigation measures may not be completely effective in avoiding significant impacts to cultural resources (see Section 4.11).

[6]Oil spills could cause significant impacts to various resources depending on the size and location of the spill. Specific mitigation measures for oil spill impacts to sensitive resources are contained under those resources.

[7]Alternative segment only; 191 miles long.

IMPACT SUMMARY TABLE FOR THE BRENDA ALTERNATIVE

	Significant Impacts	Mitigation Measure (See Section 4.10)	Effectiveness	Impact Still Significant
Air Quality				
Construction	None	NA[1]	NA	NA
Operation	None	NA	NA	NA
Geology				
Construction	None	NA	NA	NA
Operation	None	NA	NA	NA
Soils				
Construction[2]	None	NA	NA	NA
Operation	Major oil spills or leaks would contaminate soil affecting erosion rates, water uptake, and productivity. No agricultural lands occur along this route.	See Footnote[4]	NA	Yes
Surface Water				
Construction	None	NA	NA	NA
Operation	None	NA	NA	NA
Groundwater				
Construction	None	NA	NA	NA

IMPACT SUMMARY TABLE FOR THE BRENDA ALTERNATIVE

	Significant Impacts	Mitigation Measure (See Section 4.10)	Effectiveness	Impact Still Significant
Groundwater (continued)				
Operation	Degradation of groundwater quality resulting from an oil spill in a sensitive groundwater basin; estimated 0.13 spills over a 30-year project life.[3]	6 & 7	The application of mitigation measures and standard operating procedures is assumed to reduce the probability of a spill in a seneitive groundwater basin by 50 percent.	No
Aquatic Biology				
Construction	None	NA	NA	NA
Operation	None	NA	NA	NA
Terrestrial Biology				
Construction	Loss of ironwood washes.	9	Reduces acreage affected by 50 percent.	Yes
	Loss of commercial cactus.	NA	Arizona state laws protect commercial species.	No
	Construction activity causes raptor nest abandonment.	14	Eliminates impact	No
	Loss of individual desert tortoise and their habitat.	11 & 16	Minimizes numbers injured.	Yes

IMPACT SUMMARY TABLE FOR THE BRENDA ALTERNATIVE

	Significant Impacts	Mitigation Measure (See Section 4.10)	Effectiveness	Impact Still Significant
Terrestrial Biology (continued)				
Operation	None	NA	NA	NA
Socioeconomics				
Construction	None	NA	NA	NA
Operation	None	NA	NA	NA
Land Use and Recreation				
Construction	None	NA	NA	NA
Operation	None	NA	NA	NA
Transportation				
Construction	None	NA	NA	NA
Operation	None	NA	NA	NA
Cultural Resources				
Construction	None	NA	NA	NA
Operation	None	NA	NA	NA
Visual Resources				
Construction	None	NA	NA	NA
Operation	None	NA	NA	NA

IMPACT SUMMARY TABLE FOR THE BRENDA ALTERNATIVE

	Significant Impacts	Mitigation Measure (See Section 4.10)	Effectiveness	Impact Still Significant
Noise				
Construction	Construction noise would exceed 60 dBA at residences along the pipeline ROW.	None practical[5]	NA	Yes
Operation	None	NA	NA	NA
System Safety and Reliability				
Construction	None	NA	NA	NA
Operation	None	NA	NA	NA
Oil Spill Potential				
Construction	None	NA	NA	NA
Operation	Oil spill probabilities would vary based on the volume of oil lost and the age of the pipeline. There would be the probability of 0.06 spills/year of 50 barrels or greater (based on a 20-year-old pipeline).[7]	See Footnote[6]	NA	Yes[6]

[1]Not Applicable.

[2]Although construction activities would accelerate soil erosion and deposition, and decrease productivity in certain areas, no significant impacts would occur with the implementation of sound mechanical erosion control and revegetation techniques contained in the CU Plan.

FOOTNOTE (Continued)

[3]Probability is based upon .0022 occurrence/pipeline-mile/year for a greater than 2.4 bbl spill (OIW 1978). This probability is the most conservative of several sources listed in Table 4-24.

[4]Use of automatic block valves and check valves and oil spill contingency plans, as part of the project description, would substantially reduce the oil spill risk.

[5]Because of short duration of impacts, limitation to daytime hours for construction, and low probability of accomplishing effective mitigation for the noise of mobile construction activity, mitigation beyond standard use of equipment mufflers and similar OSHA requirements is not considered to be warranted.

[6]Oil spills could cause significant impacts to various resources depending on the size and location of the spill. Specific mitigation measures for oil spill impacts to sensitive resources are contained under these resources.

[7]Alternative segment only; 63 miles long.

IMPACT SUMMARY TABLE FOR THE McCAMEY TO FREEPORT ALTERNATIVE

Resource	Significant Impacts	Mitigation Measure (See Section 4.10)	Effectiveness	Impact Still Significant
<u>Air Quality</u>				
Construction	None	NA[1]	NA	NA
Operation	None	NA	NA	NA
<u>Geology</u>[2]				
Construction	None	NA	NA	NA
Operation	Potential hazards and risks of possible surface rupture and slope failures along the Balcones Fault Zone.	1	Minimize potential for serious damage leading to oil spills by better understanding seismic and fault risks and implementing appropriate offset, design techniques.	No
	Potential hazards and risks to pump and heat/pump stations and valves due to subsidence from fluid withdrawal along portions of the Gulf Coastal Plain and karstic collapse on the Edwards Plateau.	1	Identify risk areas so that appropriate design and monitoring measures can be implemented to minimize potential impacts.	No
<u>Soils</u>				
Construction[3]	None	NA	NA	NA

IMPACT SUMMARY TABLE FOR THE McCAMEY TO FREEPORT ALTERNATIVE

Resource	Significant Impacts	Mitigation Measure (See Section 4.10)	Effectiveness	Impact Still Significant
Operation	Potential oil spill impacts on sensitive soils in agricultural lands along the entire segment.	See Footnote[4]	NA	Yes
Surface Water				
Construction	None	NA	NA	NA
Operation	Major oil spills or leaks would degrade water quality below federal and state standards. Impacts would occur at and downstream from any stream crossing (Table 3-41).	See Footnote[4]	NA	Yes[7]
Groundwater				
Construction	None	NA	NA	NA
Operation	Degradation of groundwater quality resulting from an oil spill in a sensitive groundwater basin; estimated 18.5 spills over a 30-year project life.[5]	6 & 7	The application of mitigation measures and standard operating procedures is assumed to reduce the probability of a spill in a sensitive groundwater basin by 50 percent.	Yes

IMPACT SUMMARY TABLE FOR THE McCAMEY TO FREEPORT ALTERNATIVE

Resource	Significant Impacts	Mitigation Measure (See Section 4.10)	Effectiveness	Impact Still Significant
Aquatic Biology[6]				
Construction	Potential reduction in diversity and abundance of important fish species in perennial or large intermittent streams due to fuel and lubricant spills.	8	Substantially reduce the probability and frequency of spills greater than 40 gallons reaching streams.	No
Operation	Potential reductions in diversity and abundance of important fish species in perennial or large intermittent streams due to a major oil spill.	See Footnote[4]	NA	Yes[7]
	Potential reduction in abundance of intertidal invertebrates (especially shrimp, oysters, and blue crabs), surface-feeding fish, and shorebirds in nearshore marine areas due to a major oil spill into the Brazos, San Bernard, and Colorado Rivers.	See Footnote[4]	NA	Yes[7]
Terrestrial Biology[8]				
Construction	Loss of riparian woodlands.	9	Reduces acreage affected by 50 percent.	Yes
	Loss of oak woodlands	9	Sames as above	Yes

IMPACT SUMMARY TABLE FOR THE McCAMEY TO FREEPORT ALTERNATIVE

Resource	Significant Impacts	Mitigation Measure (See Section 4.10)	Effectiveness	Impact Still Significant
Terrestrial Biology (Continued)				
	Construction vehicle use off ROW affecting wildlife and sensitive plants or communities.	12	Eliminates impacts	No
	Construction activity causes raptor nest abandonment.	14	Eliminates impact	No
Operation	Potential reductions in abundance of vegetation, wintering waterfowl, and resident waterbirds in estuarine areas due to a major oil spill in the San Bernard, Brazos, and Colorado Rivers.	17	Minimizes risk of impact	Yes
Socioeconomics				
Construction	None	NA	NA	NA
Operation	See Aquatic Impacts, potential loss of commercial shrimp, oysters, and blue crab because of oil spills.	See Footnote[4]	NA	Yes[7]

IMPACT SUMMARY TABLE FOR THE McCAMEY TO FREEPORT ALTERNATIVE

Resource	Significant Impacts	Mitigation Measure (See Section 4.10)	Effectiveness	Significant
Land Use and Recreation				
Construction	None	NA	NA	NA
Operation	See Aquatic Impacts, potential loss of fin fish and shellfish because of oil spills.	See Footnote[4]	NA	Yes[7]
	Potential oil spills may reach beaches along the Gulf of Mexico.	See Footnote[4]	NA	Yes
Transportation				
Construction	None	NA	NA	NA
Operation	None	NA	NA	NA
Cultural Resources[9]				
Construction	Potential disturbance to sites eligible for listing on the National Register.	30	Minimize or avoid disturbance to cultural sites.	Yes[10]
Operation	None	NA	NA	NA
Visual Resources[9]				
Construction	None	NA	NA	NA
Operation	Potential significant visual changes at pump station sites along the pipeline ROW	NA[11]	NA	NA

IMPACT SUMMARY TABLE FOR THE McCAMEY TO FREEPORT ALTERNATIVE

	Significant Impacts	Mitigation Measure (See Section 4.10)	Effectiveness	Impact Still Significant
Noise				
Construction	Construction noise would exceed 60 dBA at residences along the pipeline ROW.	None practical	NA	Yes
Operation	None	NA	NA	NA
System Safety and Reliability				
Construction	None	NA	NA	NA
Operation	None	NA	NA	NA
Oil Spill Potential				
Construction	None	NA	NA	NA
Operation	Oil spill probabilities would vary based on the volume of oil lost and the age of the pipeline. There would be the probability of 0.41 spills/year of 50 barrels or greater (based on a 20-year-old pipeline).	See Footnotes[4] & [12]	NA	Yes[7]

[1]Not Applicable.

[2]Although no significant impacts were identified, certain hazards and risks would be associated with seismicity and faulting, slope stability, subsidence, and karstic collapse.

FOOTNOTE (Continued)

[3]Although certain construction activities would accelerate soil erosion and deposition, and decrease productivity in certain areas, no significant impacts would occur with the implementation of sound mechanical erosion control and revegetation techniques contained in the CU Plan.

[4]Use of automatic block valves and check valves and oil spill contingency plans, as part of the project description, would substantially reduce the oil spill risk.

[5]Probability is based upon 0.0022 occurrence/pipeline-mile/year for a greater than 2.4 bbl spill (OIW 1978). This probability is the most conservative of several sources listed in Table 4-24.

[6]Since the distribution of important fish species has not been determined for individual streams at this time, the location of potential significant impacts cannot be made.

[7]Level of signifiance would depend upon volume of the spill, time of year, physical characteristics of stream, and sensitivity of organisms present.

[8]Sufficient information is not available at this time to completely evaluate all impacts. In particular, the distribution of threatened or endangered species in relation to the pipeline route needs to be described.

[9]Sufficient information is not available at this time to identify location of significant impacts.

[10]Mitigation measures may not be completely effective in avoiding significant impacts to cultural resources (see Section 4.11).

[11]Specific mitigation measures will be developed after determining the location of pump stations. Techniques would be similar to those described in measures 1 and 2.

[12]Oil spills could cause significant impacts to various resources depending on the size and location of the spill. Specific mitigation measures for oil spill impacts to sensitive resources are contained under those resources.

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1.0 INTRODUCTION

1.0 INTRODUCTION

1.1 Background of the Projects

The State of California and the Bureau of Land Management (BLM) are preparing a joint state and Federal environmental impact document for the Celeron/All American and Getty Pipeline Projects. Applications have been filed for each project with the State, BLM and/or Forest Service. These applications require review under the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). A Joint Review Panel (JRP) was selected to direct the preparation of an Environmental Impact Report (EIR)/Environmental Impact Statement (EIS) to fulfill both CEQA and NEPA requirements. The California State Lands Commission (SLC) is the JRP administrator. Other panel members include the BLM California Desert District and the Energy Division of the Resource Management Department, Santa Barbara County. The U.S. Forest Service (Los Padres and Coronado National Forests), U.S. Fish and Wildlife Service (FWS), and California Office of Offshore Development (Secretary of Environmental Affairs) are cooperating agencies.

The All American Pipeline Company has proposed to build a pipeline from Emidio, California, to McCamey, Texas. This proposal was later amended to include a pipeline to be constructed by the Celeron Pipeline Company of California from Las Flores, California, to Emidio, California, and the entire project became the Celeron/All American Pipeline project. Both companies are subsidiaries of Celeron Corporation, which in turn is a subsidiary of the Goodyear Tire and Rubber Company. The Celeron/All American Pipeline would transport up to 300,000 barrels per day (BPD) of heated outer continental shelf (OCS) and other locally produced crude oils from the Santa Barbara and Santa Maria Basins to McCamey, Texas. The pipeline could also receive San Joaquin Valley crude oil at Emidio and Alaskan crude oil via the Four-Corners Pipeline at Cadiz. In western Texas the pipeline would tie into the existing pipeline network. Pipeline construction would start January 1, 1985, and operation would begin about January 1, 1987. The application for the All American Pipeline segment was submitted to BLM on May 19, 1983, and accepted on June 2, 1983. It was submitted to California SLC on May 23, 1983. The amended application for the Celeron segment was submitted to BLM and SLC on October 11, 1983. SLC deemed the amended application complete on November 4, 1983.

Getty Trading and Transportation Company of Denver, Colorado, has proposed to build the Getty Gaviota Consolidated Coastal Facility, which consists of expansion of their existing marine terminal near Gaviota, California, and construction of a pipeline from the proposed terminal to the southern San Joaquin Valley of California. Getty wishes to ship 100,000 to 400,000 BPD of heated OCS crude from the Santa Barbara and Santa Maria Basins through their proposed pipeline to the San Joaquin Valley transportation and refinery network. Up to 20,000 BPD could be shipped to San Francisco area refineries, up to 100,000 BPD to Los Angeles area refineries, and up to 280,000 BPD to Gulf Coast refineries, depending on market conditions and the construction of proposed pipelines. The sizing, construction, and operation of the project is tied to market availability and demand for OCS crude oil.

The earliest construction start date would be January 1, 1985, and the earliest operation date would be July 1985. Getty submitted an application to Santa Barbara County to construct the Getty Gaviota Consolidated Coastal Facility in May 1983. The application was amended and found complete by Santa Barbara County Energy Division on November 30, 1983. Getty applied to the Los Padres National Forest (LPNF) for a pipeline right-of-way (ROW) on July 11, 1983.

Between Las Flores and Emidio, the pipeline ROWs requested by Celeron and Getty would be adjacent to (although independent of) each other for about 70 miles. Because Celeron/All American and Getty have essentially the same proposed pipeline route to Emidio, with similar projected characteristics and effects, the pipeline component of the Getty Gaviota Consolidated Coastal Facility is being assessed in conjunction with the Celeron/All American pipeline project. The combined EIR/EIS for both applications should result in a more effective process. The proposed Getty marine terminal expansion is being considered in a separate environmental document currently being prepared for Santa Barbara County. This EIR became available for public review in July 1984.

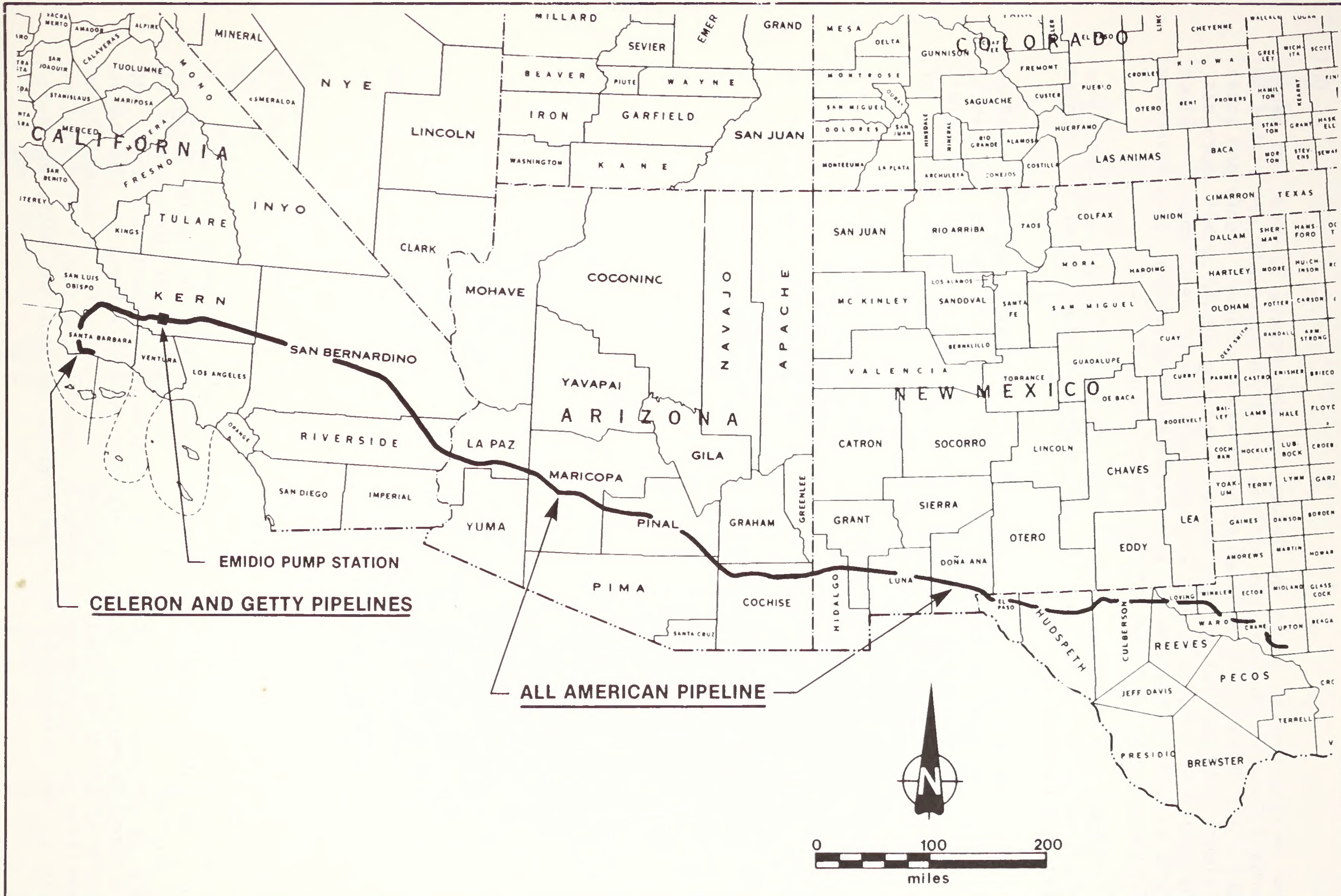
1.2 General Location of the Projects

The proposed Celeron/All American Pipeline Project would extend from the Las Flores Canyon area in western Santa Barbara County, California, where marine terminal developments have been proposed by Exxon, Arco, and Las Flores Terminal Group (a consortium), across southern California, Arizona, New Mexico, and into western Texas terminating at McCamey in Upton County. The pipeline would also connect the existing Gaviota Marine Terminal west of Las Flores and the existing Emidio pump station south of Bakersfield, California. The counties crossed by the project are shown on Map 1-1 and a more detailed location of the pipeline is shown on Map 1-2 at the end of this document. The pipeline would cross lands administered by the BLM, FWS, Forest Service, Department of Defense (DOD), and various state agencies as well as privately owned land.

The proposed Getty Pipeline Project would extend from Getty's existing Gaviota Marine Terminal in western Santa Barbara County where expansion of the terminal has been proposed by Getty, across Santa Barbara County to the north and east, across a segment of southern San Luis Obispo County, and terminate at the Emidio pump station. The Getty pipeline would follow essentially the same route as the Celeron/All American pipeline with deviations indicated on Map 1-2. The Getty pipeline would cross only private land and land managed by the LPNF and California State Parks.

1.3 Authorizing Actions

Subsequent to the requirements covered by this EIR/EIS but prior to the implementation of the Celeron/All American and Getty proposals, various Federal, state, county, and local permits must be acquired by the applicants. The Department of the Interior would issue ROW grants only for the Celeron/All American pipeline; ROW grants and approvals for



MAP 1·1 REGIONAL SETTING

the Getty pipeline would be issued by the Forest Service and Santa Barbara County. Authorizing actions for both proposals are listed in Tables 1-1 through 1-3 (Federal actions, state actions, county and local actions). As part of the process of receiving agency permit approvals, the applicants must comply with various permit requirements. Since these standard procedures or requirements are mandatory, they have been considered to be in place for the impact analysis.

After certification of the final EIR/EIS, the SLC will act on a permit to cross lands under its jurisdiction. These lands are located along the Colorado River.

In addition, each responsible state and local agency must consider the lead agency's environmental document when evaluating the permit application. A responsible agency must make its decision on a permit within 180 days of the lead agency's decision or within 180 days of accepting a complete permit application, whichever is later.

Construction of a 30-inch crude oil pipeline along All American's proposed route across the Mojave Desert in San Bernardino and Riverside Counties would not be in conformance with the BLM's California Desert Plan (1980). The Plan designated several utility corridors across the Desert to accommodate several different types of utility facilities, including all pipelines with diameters greater than 12 inches. Utility needs not conforming with designated corridors may be allowed only through the Bureau's plan amendment process. Due to the lack of conformance, the Plan must be amended to allow approval of the Celeron/All American project.

The plan will be amended through this EIR/EIS and subsequent Record of Decision. The amendment will not establish a new utility corridor. The Desert Plan (p. 115) states, "utility needs which do not conform to the adopted corridor system will be processed by means of a plan amendment." The plan does not require designation of a new utility corridor. The BLM believes that a buried pipeline does not warrant the study and designation of a major new utility corridor since a corridor carries with it the implication that any number of new utilities will be allowed along the same route in the future. Although such a study could be conducted in the future if several other utilities express a desire to use this route, the Celeron/All American pipeline will be considered, for the present, an exception to the existing corridor network.

The amendment process requires a number of steps, including publication of a Notice of Intent and Notice of Availability of Planning Criteria in the Federal Register, preparation of an EIS or an Environmental Assessment, public review (90 days for EISs), and preparation of a Record of Decision formally amending the plan. A Notice of Intent to amend the plan was published in the Federal Register on November 14, 1983. A Notice of Availability of the results of scoping meetings (serving as the pre-planning criteria document) was published February 10, 1984. Ninety days will be allowed for the public review of the Draft EIR/EIS. A Record of Decision will be issued at the same time as the ROW grant formally amending the Plan. This applies only to the Celeron/All American proposal and not the Getty proposal.

TABLE 1-1

KEY FEDERAL AUTHORIZING ACTIONS

Agency	Nature of Action	Project Feature	Applicant[1] C/A	Applicant[1] G
Department of Agriculture				
Forest Service	Issue special use permit for construction	Construction of access roads, pipeline, power transmission lines	X	X
	Issue antiquities permits and permits to excavate and remove archaeological resources on National Forest Lands	All project features	X	X
	Issue fuelwood permits	Removal of commercial wood products on National Forest lands	X	X
Department of the Interior				
Bureau of Land Management	Issue Federal ROW grant	Pipeline, access roads, power transmission lines, pump stations	X	
	Issue temporary use permits	Temporary construction activities; staging areas	X	
	Issue non-competitive mineral materials sales contract	Aggregate for pump station construction, access road construction	X	
Bureau of Reclamation	Issue special land use license or easement	Pipeline and access roads crossing Central AZ Project irrigation canals	X	
	Issue special land use permit	Pipeline, access roads, etc.	X	
National Park Service Office of the Departmental Consulting Archaeologist	Issue antiquities permits and permit to excavate or remove archaeological resources on public lands	All project features	X	X
Fish and Wildlife Service	Issue Biological Opinion on threatened or endangered species of fish, wildlife, or plants as part of Section 7 of Endangered Species Act, for all Federal actions.	All project features	X	X
National Marine Fisheries Service	Issue Biological Opinion on threatened or endangered marine mammals as part of Section 7 of Endangered Species Act, for all Federal actions.	Pipeline	X	X

TABLE 1-1 (CONTINUED)

Agency	Nature of Action	Project Feature	Applicant[1] C/A	G
Department of Defense				
Army Corps of Engineers	Issue nationwide and individual permit(s) (Section 404) for placement of dredged or fill material in waters of the U.S. or their adjacent wetlands	River or stream crossing for pipeline access roads	X	
	Issue permit(s) (Section 10) for structures or work in or affecting navigable waters of the U.S.	Water diversion facilities, and construction resulting in alterations to water courses	X	
U.S. Air Force, and Army	Issue easement to cross Department lands, individual base commanders have final approval	Pipeline across Edwards AFB, and Ft. Bliss Military Installation	X	
Federal Communications Commission	License to operate industrial radio service	Communications	X	X
Department of Transportation				
Federal Highway Administration	Issue permit(s) to cross Federal-aid highways	Pipeline, access roads	X	X
Environmental Protection Agency	Issue permit(s) to construct and operate surge tanks, storage tanks, transfer piping, and pumping equipment	Air emission permits and oil pollution control requirements for pump stations and tank storage facilities	X	X
	Issue NPDES permit(s) for wastewater discharges (CA and TX have primacy)	Any discharge of hydrostatic test water and discharges from tank storage facilities	X	X
International Water and Boundary Committee	Issue license to cross international water boundary	Pipeline construction across Rio Grande River in N.M.	X	
Federal Energy Regulatory Commission	Operations and Tariffs	Pipeline operations	X	X

Source: ERT

[1]Applicants - C/A = Celeron/All American
G = Getty

TABLE 1-2

KEY STATE AUTHORIZING ACTIONS

Agency	Nature of Action	Project Feature	Applicant[1] C/A	G
California				
State Lands Commission	Issue leases to cross state land	Pipeline crossing on state lands	X	
Department of Transportation	Issue permit(s) to cross state highways	Pipeline, access roads, transmission lines	X	X
Department of Fish and Game	Issue stream alteration agreement	Possible alterations of stream course	X	X
	Issue Biological Opinion on state rare and endangered species pursuant to BLM and California Fish and Game Memorandum of Understanding	Pipeline, access roads	X	X
Water Resources Control Board	Issue permit to discharge hydrostatic test water	Pipeline		X
	Issue permit for wastewater discharge	Any discharges from pump stations, including wastewater from runoff retention ponds	X	X
Southern California Air Pollution Control Districts	Issue permit for operating pump stations and storage tanks	Air emissions from oil heaters and storage tanks	X	X
State Historic Preservation Office	Issue cultural resource clearance	Pipeline, access roads; clearance required prior to construction	X	X
Arizona				
State Lands Commission	Issue easements to cross state lands	Pipeline, access roads	X	
Department of Transportation	Issue permit(s) to cross state highways	Pipeline, access roads	X	
Department of Horticulture	Issue permit to remove commercially valuable cactus	Pipeline, access roads; where cactus commercial value exceeds $1,000, cactus will be auctioned	X	
Department of Health Services	Issue permit to operate pump station	Air emissions from gas turbine pump stations	X	
State Historic Preservation Office	Issue cultural resource clearance	Pipeline, access roads; clearance required prior to construction	X	

TABLE 1-2 (CONTINUED)

Agency	Nature of Action	Project Feature	Applicant[1] C/A	G
New Mexico				
State Lands Office	Issue easements to cross state lands	Pipeline, access roads	X	
State Highway Department	Issue permit to cross state or interstate highway	Pipeline, access roads	X	
State Historic Preservation Office	Issue cultural resource clearance	Pipeline, access roads; clearance required prior to construction	X	
Cultural Properties Review Committee	Issue permit to cross state lands of historical, archaeological, architectural, or scientific value	Pipeline, access roads	X	
Environmental Improvement Agency, Air Quality Division	Issue permit for open burning of debris	Pipeline construction	X	
	Issue permit for constructing pump stations	Pump stations	X	
	Issue permit for operating pump station	Air emissions from heaters at pump stations	X	
Texas				
General Land Office	Issue easements to cross state lands	Pipeline, access roads, power lines	X	
Highway Department (Districts 24 and 6)	Issue permit to cross state highways	Pipeline, access roads, power lines	X	
Water Quality Board	Issue permit to discharge wastes to state waters	Discharge of hydrostatic test water	X	
Air Control Board	Issue permit for construction and operation of pump stations	Air emissions from heaters at pump stations	X	
Parks and Wildlife Department	Issue permit for streambed construction	Pipeline stream crossings	X	
Railroad Commission	Permit to operate a pipeline	Pipeline	X	
State Historic Preservation Office	Issue cultural resource clearance	Pipeline, access roads	X	

Source: ERT

[1]Applicant - C/A = Celeron/All American
G = Getty

TABLE 1-3

KEY COUNTY AND LOCAL AUTHORIZING ACTIONS

Agency	Nature of Action	Project Feature	Applicant[1] C/A	Applicant[1] G
California				
Santa Barbara Co. Board of Supervisors	Issue conditional use permit (permit includes removal of live oak trees)	Pipeline, access roads	X	X
	Issue APCD permit to construct	Pipeline and associated facilities	X	X
	Issue permit for crossing county roads	Pipeline, access roads	X	X
	Issue easement for crossing county drains	Pipeline, access roads		
	Issue permit to operate	Pipeline system	X	X
San Luis Obispo Co. Board of Supervisors	Issue permit for crossing county roads and easement for crossing county drains	Pipeline, access roads	X	X
San Luis Obispo Planning Commission and Board of Supervisors	Issue approval of Development Plan	Pipeline, access roads in County	X	X
Kern Co. Board of Supervisors	Issue permit for crossing county roads	Pipeline, access roads	X	X
	Issue permit for removing Joshua trees	Pipeline, access roads	X	
San Bernardino Co. Flood Control District, Board of Commissions	Issue easement for crossing county drains	Pipeline, access roads	X	
San Bernardino Co. Road Department	Issue excavation permit for crossing county roads	Pipeline, access roads	X	
San Bernardino Co. Board of Supervisors	Issue franchise and excavation permit for encroachment of county roads	Pipeline, access roads	X	
Riverside Co. Planning Commission and Board of Supervisors	Issue public use permit for pipeline construction	Pipeline	X	
Riverside Co. Road Department	Issue franchise and excavation permit to cross county roads	Pipeline, access roads	X	
Riverside Co. Flood Control District, Board of Commissioners	Issue easement to cross county drains	Pipeline, access roads	X	

TABLE 1-3 (CONTINUED)

Agency	Nature of Action	Project Feature	Applicant[1] C/A	Applicant[1] G
Arizona				
Maricopa, Pinal, Pima, La Paz, and Cochise Co. Board of Commissioners	Issue response to letter of intent for pipeline construction across county lands	Pipeline, access roads, power lines	X	
	Issue permit to cross county roads	Pipeline, access roads	X	
	Issue permit to construct and operate pump stations	Pump stations at or near Blythe, the Gila River, Coolidge, Oracle Junction, and Hot Springs, AZ	X	
Cochise Co. Floodplain Board	Issue permit to divert, obstruct, or retard flow of watercourses	Pipeline stream crossings	X	
New Mexico				
Hildalgo, Grant, Luna, and Doña Ana Co. Board of Commissioners,	Issue permit and ROW to cross county roads	Pipeline, access roads	X	
Doña Ana Co. Planning Commission	Special use permit for pipeline construction	Pipeline, access roads	X	
Texas				
El Paso, Hudspeth, Culberson, Loving, Winkler, Ward, Crane, and Upton Co., County Commissioners Court	Issue permits to cross county roads	Pipeline, access roads	X	
	Issue permit to construct and operate pump stations	Pump stations at Salt Flats, Wink, Crane, and McCamey, TX	X	

Source: ERT

[1]Applicant - C/A = Celeron/All American
G = Getty

The BLM Record of Decision and the Federal ROW grant for the Celeron/All American project can not be issued until at least 30 days have elapsed from the date the final EIR/EIS is published. That 30-day period would serve as both a public comment period on the final EIR/EIS and an opportunity to file protests on the Desert Plan amendment. At about the same time, a copy of the EIR/EIS will be provided to the Governor of California for 60 days to determine whether the amendment is consistent with state and local plans, policies, and programs. The ROW grant will not be issued until this determination has been made. Following the review period, a decision on the amendment and a ROW grant would be issued (pending resolution of protests).

The grant would contain general mitigation measures, as well as a requirement that no construction occur until a detailed Construction and Use (CU) plan has been submitted to a designated Federal authorized officer and a Notice to Proceed has been issued. The CU plan would be developed for Federal lands in accordance with Federal regulations [43 CFR Part 2882.2-4(c), Management of Oil and Natural Gas Pipelines and Related Facilities]. At a minimum, the plans would include:

- Schedules for construction of the pipeline and all related facilities and estimated construction costs;
- Plans for the protection of the environment during construction, operation, maintenance, and abandonment of the pipeline;
- Plans for emergency repair of any rupture during operation, containment of effluent, and restoration of damage.

For Forest Service-administered lands, the applicant would include in the CU plan a fire plan, a landscape plan, and a maintenance plan. These plans would include:

- The alignment of the pipeline, contract specifications, access roads, clearing of vegetation for ditching, type of ditch by area, cuts and fills, and any other activities related to construction of the project;
- A description of channels of responsibility for fire prevention and suppression, attack procedures, tools, equipment, and manpower.
- A description of the clearing and maintenance procedures that would be used to reduce the "slot" effect that may be created by the ROW.

The Forest Service also has a special concern that the route selected would have potential to accommodate additional pipelines or other utilities which might be proposed in the future. Any future proposal would require a separate environmental document.

The BLM would conduct an environmental and engineering review of the CU plan. Site-specific mitigation measures would be developed during this review and would be included in the Notice to Proceed. Where environmental impacts cannot be mitigated, the grant holder may be required to realign the pipeline. The Notice to Proceed would also contain mitigation developed as a result of a Class III (100 percent) archaeological survey of the pipeline centerline and adjacent land. The Class III survey would be required on all Federal lands. Results of the survey would be submitted to the State Historic Preservation Officer (SHPO) in each affected state and to the Advisory Council on Historic Preservation. Any mitigation measures developed as a result of consultation with the SHPOs and the Advisory Council would be included in the Notice to Proceed. This would ensure compliance with Section 106 of the National Historic Preservation Act, in accordance with the procedures set forth in 36 CFR 800 and in various memoranda of agreement.

The Federal authorized officer would inspect and monitor construction to assure compliance with the Notice to Proceed and all stipulations.

1.4 Environmental Review Process

The first step in the EIS (Federal) process is to publish a Notice of Intent (NOI) for the preparation of an EIS in the Federal Register. The NOI for the Celeron/All American Pipeline Project was published on November 14, 1983. An amended NOI incorporating the Getty Pipeline Project into this EIS was published on November 30, 1983. The first step in the EIR (California) process is the publication of a Notice of Preparation (NOP). SLC circulated an NOP to all affected state and local agencies along the proposed pipeline route. These agencies identified for SLC those areas of concern that should be considered as part of the project review and included in the EIR as necessary.

The second step in the NEPA/CEQA process is termed "scoping". The purpose of scoping is to determine the significant issues and concerns related to a proposed action which should be included in the EIR/EIS. Public meetings were used to identify major issues and concerns. During November and December 1983, seven scoping meetings were held in cities in the general vicinity of the proposed pipeline routes. They were located (sequentially) at San Bernardino, California; Phoenix and Tucson, Arizona; Las Cruces, New Mexico; and Bakersfield, Santa Barbara, and Santa Maria, California. A total of about 150 people attended the meetings.

A BLM representative opened each meeting by explaining the meeting's purpose and the roles of the Federal, state, and local governments and of the project proponents. The proponents then described the projects using slides and maps. A question and answer period followed, during which major concerns and issues were identified. Issues were written down on a flip-chart, numbered, and posted for all to see. Each member of the audience was asked to rate the issues on a ranking form in order of their importance to that individual.

After each meeting, the issue ranking forms were scored. Each issue was given a score depending on its ranking on the form. For example, if 12 issues were identified, the top-rated issue was assigned 12 points, the second 11 points, and so forth. After all forms had been scored, the total number of points earned by an issue on all forms was determined by adding scores together. In this way, a total score for each issue was obtained. The issues tended to be clustered into three categories; hence, the designation high concern, medium concern, and low concern (see Table 1-4). A detailed summary was published by BLM in February 1984 and is available at the California Desert District office in Riverside and the Forest Service Santa Lucia Ranger District office in Santa Maria, CA.

The issues of high and medium concern are discussed in this EIR/EIS. Additional concerns of the cooperating agencies were added to this list for discussion, and some of the issues were combined with other closely related issues for discussion purposes. Low interest items are not discussed in the EIR/EIS unless they are related to a significant impact or were requested by one of the cooperating agencies.

1.5 Purpose of and Need for the Projects

The applicants have proposed their respective pipeline projects to transport heavy crude oil from Santa Barbara County to refineries that have the capability and capacity to refine this oil. Celeron/All American proposes to transport 300,000 BPD of oil to an existing terminal at McCamey, Texas, while Getty proposes to transport 100,000 to 400,000 BPD of oil to an existing terminal near Bakersfield, California. Heavy crude oil transported by Celeron/All American would go to refineries near Houston and along the Gulf Coast, while light crude oil could go to many refineries in the eastern United States. Heavy crude oil transported by Getty could go to refineries in the San Francisco, Bakersfield, and Los Angeles areas. Another expressed purpose of the projects is to reduce both local and regional surplus of crude oil on the West Coast. The higher volumes proposed by Getty would be expected if a west-to-east pipeline is constructed. The following paragraphs present the need for the projects as determined by the applicants. Additional detail on purpose and need can be found in the applications filed by Celeron, All American, and Getty with Santa Barbara County, SLC, BLM, and the Forest Service.

1.5.1 Celeron/All American

Recent oil discoveries off the coast of California and onshore exploration have yielded significant new reserves of heavy, high sulfur crude oil. As a result of these discoveries, it is anticipated that there will be a major surplus of heavy, high sulfur crude oil on the West Coast reaching as much as 1.2 million BPD by 1990 (California Independent Producers Association 1983). The refineries in California will be unable to process this anticipated surplus. One means of solving the surplus problem would be to transport the excess production to refineries east of the Rocky Mountains.

The crude oil supply position of West Coast refiners has changed substantially over the last 20 years. Previously, West Coast refiners supplemented local production with substantial volumes of imported crude oil. In the early 1960s, however, crude oil from Alaska began moving into California. After North Slope crude oil came on stream in 1977, total production from Alaska increased to its current level of 1.7 million BPD. In recent years, crude oil has also come from the Elk Hills Naval Petroleum Reserve.

TABLE 1-4

SUMMARY OF ISSUES AND CONCERNS
RAISED DURING SCOPING

Issue	Rating
River Crossings	High
Impairment of Access	High
Hydrology	High
Restoration of ROW	High
Local Employment Opportunities	High
Oil Spills	High
Native Americans	Medium
Relationship to Other Pipelines	Medium
Source of Natural Gas	Medium
Alternative Routes	Medium
Native Plants	Medium
Agriculture	Medium
Pump Stations, Terminals	Medium
Wilderness	Medium
California Desert Plan	Medium
Alignment of ROW	Medium
Ecological Impacts (oak trees)	Medium
Mitigation of Dust Emissions	Medium
Cultural Resources	Low
Future Pipeline Expansion	Low
Condemnation	Low
Construction (time of year)	Low
Construction Effects	Low
Control of Access	Low
Noise	Low
Line Explosion	Low
Role of Federal ROW to Future Landowners	Low
Road Traffic	Low
No Project	Low
Endangered Species	Low
Geological Hazard	Low
Consistency with County General Plans	Low
Taxes	Low

Source: BLM

Oil discoveries offshore of Santa Barbara County will add up to 500,000 BPD to the West Coast supplies by 1986. However, the offshore Santa Barbara crude oil will be of relatively poor quality (i.e., low specific gravity and high sulfur content). Only a limited amount of this oil can be processed by the California refineries which are designed to process crudes with higher specific gravity and lower sulfur content.

Celeron/All American believes that the best way to resolve the problem of a large surplus of crude oil on the West Coast which cannot be processed locally is to transport the oil to markets that need and can utilize it. The only crude oil pipeline now connecting California with pipeline systems east of the Rocky Mountains is the Four Corners Pipeline which can transport only 60,000 BPD out of Long Beach. The only alternative ways to transport surplus crude production to other regions of the country are either to construct a new pipeline or construct new marine terminals and ships. Analysis conducted by Celeron/All American indicates that existing marine terminals are inadequate to handle this volume of oil and that the existing American tanker fleet (U.S. flag ships are required) is too small and antiquated to handle additional shipments. Pipelines have historically been more cost effective than ships in moving commodities between areas which pipelines can physically serve. The main reasons are that the operating costs of ships escalate more rapidly than do the operating costs of pipelines; ships usually have one leg of the voyage in which they run empty; ships have a shorter useful life than pipelines; and ships are more prone to shutdowns and delays. Pipelines also tend to have fewer air pollution problems and pose a smaller risk of marine oil spills.

For the reasons mentioned above, Celeron/All American believes that a new crude oil pipeline from western Santa Barbara County to the existing pipeline system in west Texas for subsequent transportation to refineries in eastern Texas, the Gulf Coast, and the eastern U.S. is the most practical and economical way to reduce the growing surplus of crude oil available to West Coast refineries.

1.5.2 Getty

The Getty Gaviota to San Joaquin Valley pipeline is an integral part of Getty's proposed Gaviota Consolidated Coastal Facility. The background for this entire project is discussed in Section 3.1, Volume I, of Getty's Application (Getty 1983a) and environmental impacts associated with the consolidated facility are discussed in the Getty Gaviota Consolidated Coastal Facility EIR scheduled to be released in July 1984. According to Getty "the pipeline design provides for maximum flexibility". The system must be designed to quickly respond to changing supply and demand conditions. The uncertainty of world events requires optimizing logistical capabilities. Use of the pipeline would add to the flexibility of the expanded marine terminal by providing access to inland markets for 100,000 to 400,000 BPD of offshore crude.

Construction and operation of the pipeline would be dependent on crude oil production and market conditions. Since the range and timing of OCS production is uncertain, it is difficult to predict the optimum timing and size of the Getty pipeline.

Shippers will ultimately determine the need for an inland pipeline for disposition of oil from OCS production. In anticipation of this need, Getty proposes to construct a pipeline from Gaviota to the San Joaquin Valley transportation and refinery network for subsequent transportation to refineries in the San Francisco, Bakersfield, and Los Angeles areas. Current forecasts of production indicate that the need for a pipeline will occur in the late 1980s.

1.6 Economic Supply and Demand of West Coast Crude Oil

An analysis of existing economic supply and demand studies was conducted by Robert Brown Associates to demonstrate the general viability and need for the Celeron/All American and Getty proposals. A summary of this analysis is presented here and is included in its entirety in Appendix G.

1.6.1 Crude Oil Supply

The United States is divided into five Petroleum Administration for Defense Districts (PADDs). The states of Washington, Oregon, Nevada, California, Arizona, Hawaii, and Alaska comprise PADD V and the Gulf States comprise PADD III. Crude oil production in PADD V is expected to increase from about 2.8 million BPD in 1982 to about 3.2 million BPD in 1990. Alaska production is projected to contribute about 1.8 million BPD during this period. The OCS California crude oil production is projected to increase from 76,000 to 500,000 to 600,000 million BPD (Table 1-5).

TABLE 1-5

WEST COAST CRUDE OIL SUPPLY AND DEMAND

(Thousands of BPD)

	1982	1985		1990		1995		2000	
		P&G[1]	ADL[2]	P&G	ADL	P&G	ADL	P&G	ADL
SUPPLY									
California									
OCS[3]	76	121	160	421	594	556	411	439	221
Other	899	886	876	821	865	728	839	634	809
Alaska	1,698	1,800	1,790	1,860	1,730	1,600	1,290	1,600	1,130
Imports	92	50	100	50	50	50	100	50	100
Total Supply	2,765	2,857	2,926	3,152	3,239	2,934	2,640	2,723	2,260
DEMAND									
PADD V Crude Oil	2,020	2,070	1,985	2,090	1,935	2,170	1,955	2,250	1,975
Surplus	745	787	941	1,062	1,304	764	685	473	285

[1]Purvin and Gertz, Inc. 1983

[2]Arthur D. Little, Inc. 1984

[3]Includes Carpenteria, Dos Cuadras, Santa Clara, Beta, Hueneme, and Santa Ynez

1.6.2 Crude Oil Demand

The primary refineries within the PADD V region are in the Puget Sound, San Francisco Bay, and Los Angeles areas. California OCS crude oil is low in gravity and high in sulfur, metals, and vicosity (Table 1-6). These characteristics make the oil more difficult and costly to refine. Most of the refineries in PADD V are designed to refine lighter oils and are incapable of refining OCS crude without costly retrofitting. The demand for crude oil in PADD V is expected to remain at about 2.0 million BPD from 1982 through 2000 (Table 1-5). The crude oil surplus is expected to increase from 745,000 BPD in 1982 to about 1.1 to 1.3 million BPD in 1990 and to decrease to less than 500,000 BPD in the year 2000.

TABLE 1-6

COMPARISON OF PADD V CRUDE OIL QUALITIES

PROPERTY	California OCS (Hondo)	Alaskan North Slope	Indonesian Minas	Average California Crude Slate
Gravity, °API	17.4	26.3	35.3	25.2
Sulfur, Wt%	4.9	1.0	0.1	1.0
Metals, ppm (1,000°F+ fraction)	718	103	57	NA[1]
Viscosity (Centistokes @ 100°F)	446	16	19	NA

Source: Arthur D. Little, Inc. 1984, Purvin and Gertz, Inc. 1983, and Robert Brown Associates

[1]Not Available

West Coast refineries can accommodate limited quantities of OCS crude before refinery retrofits are required. An analysis of the potential ability of West Coast refiners to refine OCS crude is presented in Table 1-7. With no retrofits about 80,000 to 115,000 BPD would be refined and with retrofits 250,000 to 280,000 BPD would be refined. Moreover, the cost to retrofit these refineries to handle 280,000 BPD of lower gravity OCS crude oil would exceed $900 million, with an annual operating cost increase of about $300 million (1983 dollars) (ADL 1984). Additional costs would be incurred for the offsets for sulfur dioxide and oxides of nitrogen after the application of LAER and BACT technologies.

PADD III, the U.S. Gulf Coast, is the largest potential refining area outside of PADD V. Refiners have a large capacity and an intricate transportation network to markets throughout PADDs I through IV. Some PADD III refineries have recently been restructured to refine high sulfur, heavy crude oils. The increased availability of lower quality and lower priced crudes has resulted in $5 billion of capital

TABLE 1-7

ESTIMATE FOR 1991 OCS CRUDE OIL PRODUCTION
TO BE REFINED IN PADD III
(Thousands of BPD)

	Low Estimate	High Estimate
High estimate of OCS crude oil production	NA[1]	600
Low estimate of OCS crude oil production	500	NA
High estimate of OCS crude oil refined in PADD V	(300)	NA
Low estimate of OCS crude oil refined in PADD V	NA	(100)
Quantity of oil to be refined in PADD III	200	500

Source: Robert Brown Associates

[1]Not Applicable

investments to allow some refineries in PADD III to be able to refine these crudes. An additional $1 billion of capital has been announced for future PADD III refinery investments. The demand for crude oil in PADD III is estimated to be 5.1 million BPD between 1985 and 2000 (ADL 1984). By 1991 200,000 to 500,000 BPD of OCS crude oil is projected to be refined in PADD III (Table 1-7). Adequate processing capability probably will exist to accommodate 500,000 BPD of the lower quality OCS crude oil.

1.6.3 Crude Oil Transportation

The current transportation system within PADD V is reasonably complete, however, there is no direct high volume connection to PADD III other than shipping by tankers. By the peak year (1992), the Santa Barbara Channel and Santa Maria Basins are projected to produce about 500,000 BPD of crude oil that will require transport to refineries. Based on the preceding discussion, about 80,000 to 280,000 BPD would be refined at PADD V and the remainder (200,000 to 500,000 BPD) transported to PADD III.

If both the Celeron and Getty pipelines are constructed as proposed, up to 700,000 BPD of crude oil could move to the Bakersfield area. From the Bakersfield area some of the oil could be shipped by existing lines to Bakersfield, San Francisco Bay, and Los Angeles refiners. The available capacity of the existing pipelines to the California refining centers is estimated to be about 80-90,000 BPD. The proposed All American pipeline would enable the transport of oil to PADD III refineries. The two applicants, Celeron/All American and Getty, would size their throughputs relative to crude oil supply and refinery demand and crude oil transportation network capacity. Thus, the market place would determine the actual volumes transported.

The All American pipeline would transport crude oil from the termination of the Getty and Celeron pipelines in the Bakersfield area to West Texas. In addition Alaskan North Slope crude oil will be able to enter the system at Cadiz, California where the existing Four Corners Pipeline Company's Line 90 crosses the planned alignment of the All American line. The Four Corners Pipeline Company's Line 90 runs from the existing marine terminals in the Long Beach/Los Angeles Harbor to the Four Corners area of Utah.

From All American's planned termination point in McCamey, the Alaskan North Slope and light California crudes can be easily transferred to most refining centers in PADDs I-IV. However, the heavy San Joaquin Valley crudes and new OCS crudes are expected to require heated pipelines. These have too high a viscosity to be pumped at ambient temperatures. No heated pipelines exist in West Texas. All-American has asked the owners of an existing West Texas-to-Houston pipeline, the Rancho Pipeline, to investigate converting the pipeline to heated service. Historically it has been difficult to obtain approval of all owners of a pipeline to agree to pipeline modifications. Therefore it cannot be assured that the Rancho Pipeline or other pipelines will be available to transport the heavy crude. The refining centers in west Texas have limited ability to refine the heavy high metal content crude expected from the California OCS and San Joaquin Valley.

An alternative to pipeline transport of oil to PADD V and PADD III refiners is marine tankers. In evaluating the economics of the two transportation modes, numerous assumptions must be made including cost of capital, project financing structure, availability of U.S. flag tankers (the Jones Act of 1920 requires that all vessels moving cargo between U.S. ports be U.S. flag), cost estimates for new ships and pipelines, operating costs, future escalation factors in operating costs, and numerous political and business responses relative to the perceived market place and perceived supply and demand.

Recent cost estimates were prepared for tanker transport by Arthur D. Little, Inc. (ADL 1984) and Purvin and Gertz, Inc. (1983), and estimates were prepared for pipeline transport by ADL and All American Pipeline Company in support of their application (Table 1-8). There is large variation among these estimates. All American has estimated the per barrel cost of transport at $2.89 for transport to the Houston area via Rancho Pipeline and $3.84 via the McCamey to Freeport new pipeline

TABLE 1-8

CALIFORNIA OCS CRUDE TRANSPORTATION COST ANALYSIS

($/Barrel)

	Gaviota Coast/Houston Vessel (MDWT)[1]				Pipeline (300,000 BPD)			
	60(new)	60(old)	200/50(new)	200/50(old)	Las Flores/ Bakersfield	Bakers- field/ Midland	Midland/ Houston	Las Flores/ Houston
SOURCE								
Arthur D. Little, Inc.	8.69	4.65	7.71	4.11	0.59	4.16	2.26	7.00
Purvin and Gertz, Inc.	8.82	NA[2]	7.26[3]	NA	NA	NA	NA	NA
All-American[4,5] Pipeline Co.	NA	NA	NA	NA	0.31	2.05	0.53	2.89
Getty	NA	NA	NA	NA	0.45 to 0.55	NA	NA	NA

Sources: ADL 1984, Purvin and Gertz, Inc. 1983, and Robert Brown Associates

[1]MDWT: Thousands of deadweight tons.

[2]Not Available

[3]Purvin and Gertz's 200/50 MDWT transportation cost analysis was based on 180 MDWT ships and 50 MDWT.

[4]Getty did not provide information for economic analysis.

[5]The Midland to Houston link includes the tariff for the existing Rancho Pipeline and a surcharge to pay for heating the line. Arthur D. Little, Inc. assumed a new pipeline.

alternative. ADL estimates translate to $7.00 per barrel on an equivalent cost of capital basis. The ADL estimate includes a much higher pipeline construction cost and assumes a new line from Midland to Houston, Texas. The estimates for tankering range from $4.11 to over $7.00 per barrel assuming new tankers would be required. There is a possibility that many new ships would be required because of the high volume of oil to be shipped and the high number of old ships that would not meet future environmental requirements and thus, would be retired. All American has stated that they have bids to substantiate the pipeline construction costs. The pipeline operating costs have fewer variables than ship transport operating costs, and thus costs are more predictable through time.

In conclusion, it appears that the proposed pipelines would be capable of transporting the crude oil out of the Santa Barbara Channel and Santa Maria Basin to PADD V and PADD III refiners and could do so at a competitive transportation cost.

2.0 CELERON/ALL AMERICAN AND GETTY PROPOSALS AND ALTERNATIVES

2.0 CELERON/ALL AMERICAN AND GETTY PROPOSALS AND ALTERNATIVES

2.1 Introduction

This chapter describes the pipeline projects that have been proposed by Celeron/All American and Getty for the transportation of heated crude oil from the Santa Barbara coast to the existing oil transportation networks in central California and western Texas. Celeron/All American proposes to construct a 24 to 30-inch pipeline to transport 300,000 barrels per day (BPD) of crude oil to McCamey, Texas, while Getty proposes to construct a 20 to 30-inch pipeline to transport 100,000 to 400,000 BPD to the existing Emidio pump station in western Kern County, California, south of Bakersfield. Table 2-1 summarizes the components and facilities of the proposed pipeline projects. Additional details on Celeron/All American's and Getty's proposals can be found in the right-of-way (ROW) applications that have been filed with the California State Lands Commission (SLC), Bureau of Land Management (BLM), U.S. Forest Service, and Santa Barbara County (SBC). These documents are available for public review at the SLC in Sacramento, BLM California Desert District in Riverside, Los Padres National Forest Supervisor's Office in Goleta, CA, and the SBC Energy Division in Santa Barbara.

In addition to the Celeron/All American and Getty proposals, three routing alternatives have been identified. These are the Santa Maria Canyon, Desert Plan Utility Corridor, and Brenda Alternatives, and their components and facilities are also summarized in Table 2-1. The Santa Maria Canyon Alternative crosses a portion of the Los Padres National Forest (LPNF) in Santa Barbara County; the Desert Plan Alternative is in the Mojave Desert in eastern California; and the Brenda Alternative is in western Arizona near the Kofa National Wildlife Refuge (NWR). These alternative routes were identified to provide optional locations for the pipelines in sensitive areas.

A summary of the ownership of lands affected by the pipeline ROWs, pumping/heating stations, and tank farm is presented on Table 2-2 for the Celeron/All American and Getty proposals and on Table 2-3 for the routing alternatives. The following sections discuss in detail the components of the Celeron/All American and Getty proposals and the alternatives as well as construction, operation, maintenance, and abandonment procedures.

2.2 Celeron/All American and Getty Proposals

2.2.1 Project Components

2.2.1.1 Celeron/All American. Celeron Pipeline Company of California (Celeron) proposes to construct a 122-mile, 24 to 30-inch diameter, buried pipeline designed to transport 300,000 BPD of heated Outer Continental Shelf (OCS) and other locally produced crude oils. Oil would be delivered to the pipeline at 160 °F. The pipeline would begin at a point near Las Flores Canyon, parallel the north side of US 101 to the Gaviota Pass area, turn north and parallel the west side of US 101 past Buellton, cross the Sisquoc River and enter the LPNF at

TABLE 2-1

PROJECT COMPONENTS AND FACILITIES

	Proposals			Alternatives		
	Getty	Celeron Segment	All American Segment	Santa Maria Canyon	Desert Plan	Brenda
Facilities						
Total length (miles)	113	121.5	1,084	38.5	191	63
No. Pipeline Stations[1]	3	3	15	1	part of tank farm	0
No. Block & Check Valves	13	11	59	9	~3[2]	~2[2]
No. Tank Farms	0[3]	0	1	0	1	0
No. Insulating Yards	0	2	19	0	0	0
Land Requirements						
Construction ROW[4] (acres) (Temporary disturbance)	770	1,473	13,139	467	2,315	764
Operation ROW[5] (acres) (Permanent disturbance)	see note					
Pipeline Stations[1] (acres)	6	8.5	77	0	part of tank farm	0
Tank Farm (acres)	0	0	20	0	20	0

Sources: Celeron/All American, Getty, and ERT.

[1]Includes pumping stations, heating stations, and delivery stations (see Table 2-5). Emidio was included only as part of the All American segment to avoid double counting.

[2]Detailed engineering has not been conducted.

[3]A tank farm is being proposed as part of the Getty Gaviota Consolidated Coastal Facility.

[4]Assumes 100-ft construction ROW for Celeron/All American, and for Getty 99 miles of the ROW at 50 ft and 14 miles of the ROW at 100 ft.

[5]Getty would have a a 20-ft operation ROW, while Celeron/All American would have a 50-ft ROW. Since the ROW would be returned to its preconstruction land use or vegetation type, permanent or ongoing disturbance is not ancitipated.

TABLE 2-2

OWNERSHIP OF LANDS AFFECTED BY THE CELERON/ALL AMERICAN AND GETTY PROPOSALS

	Federal													
	BLM		FWS		FS		DOD		State		Private		Total	
	Miles[1]	Acres	Miles[1]	Acres	Miles[1]	Acres	Miles[1]	Acres	Miles[1]	Acres	Miles[1]	Acres	Miles[1]	Acres
GETTY														
Pipeline	0	0	0	0	15.5	94	0	0	3	18	94.5	658	113	770
Stations	0	0	0	0	0	0	0	0	0	0	0	6	0	6
TOTAL	0	0	0	0	15.5	94	0	0	3	18	94.5	664	113	776
CELERON SEGMENT														
Pipeline	0	0	0	0	16	194	0	0	4	49	101.5	1,230	121.5	1,473
Stations	0	0	0	0	0	0	0	0	0	0	0	8.5	0	8.5
TOTAL	0	0	0	0	16	194	0	0	4	49	101.5	1,238.5	121.5	1,481.5
ALL AMERICAN SEGMENT														
Pipeline														
California	157	1,903	0	0	0	0	18	218	0.5	6	118.5	1,437	294	3,564
Arizona	105.5	1,279	26	315	0.7	8	0	0	102.8	1,246	113.5	1,376	348.5	4,224
New Mexico	59.5	721	0	0	0	0	0	0	41	497	56	679	156.5	1,897
Texas	0	0	0	0	0	0	5	60	7	85	273	3,309	285	3,454
TOTAL	322	3,903	26	315	0.7	8	23	278	151.3	1,834	561	6,801	1,084	13,139
Stations														
California	0	5.5	0	0	0	0	0	0	0	0	0	11	0	16.5
Arizona	0	11	0	0	0	0	0	0	0	16.5	0	0	0	27.5
New Mexico	0	5.5	0	0	0	0	0	0	0	0	0	5.5	0	11
Texas	0	0	0	0	0	0	0	0	0	0	0	22	0	22
TOTAL	0	22.0	0	0	0	0	0	0	0	16.5	0	38.5	0	77
Tank Farm														
California (Cadiz)	0	20	0	0	0	0	0	0	0	0	0	0	0	20

Sources: Celeron/All American, and Getty

[1]Linear miles crossed.

La Brea Canyon. After descending the Sierra Madre Mountains, the route would turn east and follow the north side of California State Highway 166 through the Cuyama Valley and on to All American's proposed Emidio pump station in the southern San Joaquin Valley (see Map 1-2, sheets 2 and 3 at the end of this document).

TABLE 2-3

OWNERSHIP OF LANDS AFFECTED BY ALTERNATIVES CONSIDERED IN THIS EIR/EIS

	Federal									
	BLM		FS		State		Private		Total	
	Miles[1]	Acres	Miles[1]	Acres	Miles[1]	Acres	Miles[1]	Acres	Miles[1]	Acres
Santa Maria Canyon	0.5	6	4.5	54	0	0	33.5	407	38.5	467
Desert Plan	136	1,649	0	0	3	36	52	630	191	2,315
Brenda	54	655	0	0	3	36	6	73	63	764
McCamey to Freeport	0	0	0	0	0	0	460	5,575	460	5,575

Sources: Celeron/All American, Getty, and ERT.

[1]Linear miles crossed.

The All American Pipeline Company proposes to construct an 1,084-mile, 24 to 30-inch pipeline to transport 300,000 BPD of heated crude oil from the Emidio station through Arizona and New Mexico, and into west Texas (see Map 1-2, sheets 4 through 12). The pipeline route would cross the Tehachapi Mountains and the Mojave Desert passing near Mojave and Barstow, cross the Colorado River into Arizona at Blythe, cross southern Arizona passing south of Phoenix and north of Tucson, cross southern New Mexico passing near Lordsburg and Deming, cross the Rio Grande into Texas between Las Cruces and El Paso, and continue on across west Texas to Wink, Crane, and McCamey. Celeron's pipeline construction cost is estimated at $92 million and annual operating cost at 7.6 million; All American's construction cost is estimated to be $605 million and annual operating cost at $59 million.

The Celeron pipeline system would consist of the following major components:

- 122 miles of 24 to 30-inch insulated pipeline,
- 15 block and check valves,
- 3 pump stations,
- 1 delivery station (Emidio).

Construction of new access roads is not anticipated for operation of the pipeline system. Existing roads or the ROW itself would be used for surface travel.

All American's pipeline system would consist of the following components:

- 1,084 miles of 24 to 30-inch pipeline,
- 63 block and check valves,

- 2 pumping stations,
- 1 heating station,
- 10 pumping and heating stations,
- 20-acre tank farm at Cadiz,
- 2 delivery stations.

No new access roads longer than 2,600 feet (ft) would be required to reach the pumping stations. Utility requirements (electricity and natural gas) for the Celeron/All American pipeline are shown in Table 2-4.

The Celeron/All American pipeline used for analysis in this EIR/EIS would have the following specifications: 30-inch outside diameter; 0.344 to 0.562-inch wall thicknesses, with corresponding maximum operating pressures of 991 to 1,618 psig, respectively. The entire Celeron pipeline segment and a minimum of 20 miles of pipe downstream from each heating station on the All American pipeline segment would be insulated. Inlet temperature of the crude oil would average 160°F. The pipelines would be insulated with 1.5 inches of polyurethane with a vinyl outer jacket to minimize heat loss from the line. The pipe coating, where not insulated, would be a double wrap of plastic tape; in selected areas, such as river crossings, the pipe would have a coal tar coating overlaid with a concrete jacket.

The entire pipeline would be protected from corrosion with cathodic protection systems consisting of groundbeds and rectifiers. The number and location of these systems would be based on tests of pipe-to-soil potential after construction. Corrosion protection test stations would be installed at least every 10 miles to test the performance of the cathodic protection system. These stations, which are about the size of a parking meter, would be within the ROW.

Pipeline block and check valves would be located at strategic locations along the route (see Map 1-2). Block valves at the pump stations and on the upstream (of oil flow) side of major stream crossings (Refugio Creek, Gaviota Creek, Santa Ynez River, Sisquoc River, La Brea Creek, Cuyama River, Mojave River, Colorado River, Gila River, Wild Cat Canyon Creek, Rio Grande, and Pecos River) would be remotely operated. Check valves would be installed on the downstream (of oil flow) side of all major river and stream crossings, and block valves would be installed on both sides of all pump stations. Each block valve setting would require a 10-ft by 20-ft area. Figure 2-1 shows a typical block valve installation.

Remote control block valves installed at the sensitive areas identified above would be operated in two basic ways. The more traditional way would be to use an electric motor to open and close the valve. This system requires both power and communications. The second method would use a pneumatic or hydraulic actuator and requires only communications. Energy would be supplied by bottled nitrogen gas or solar panels operating a small hydraulic pump. The second method would be used at block valve sites which are too remote to be supplied with line power.

TABLE 2-4

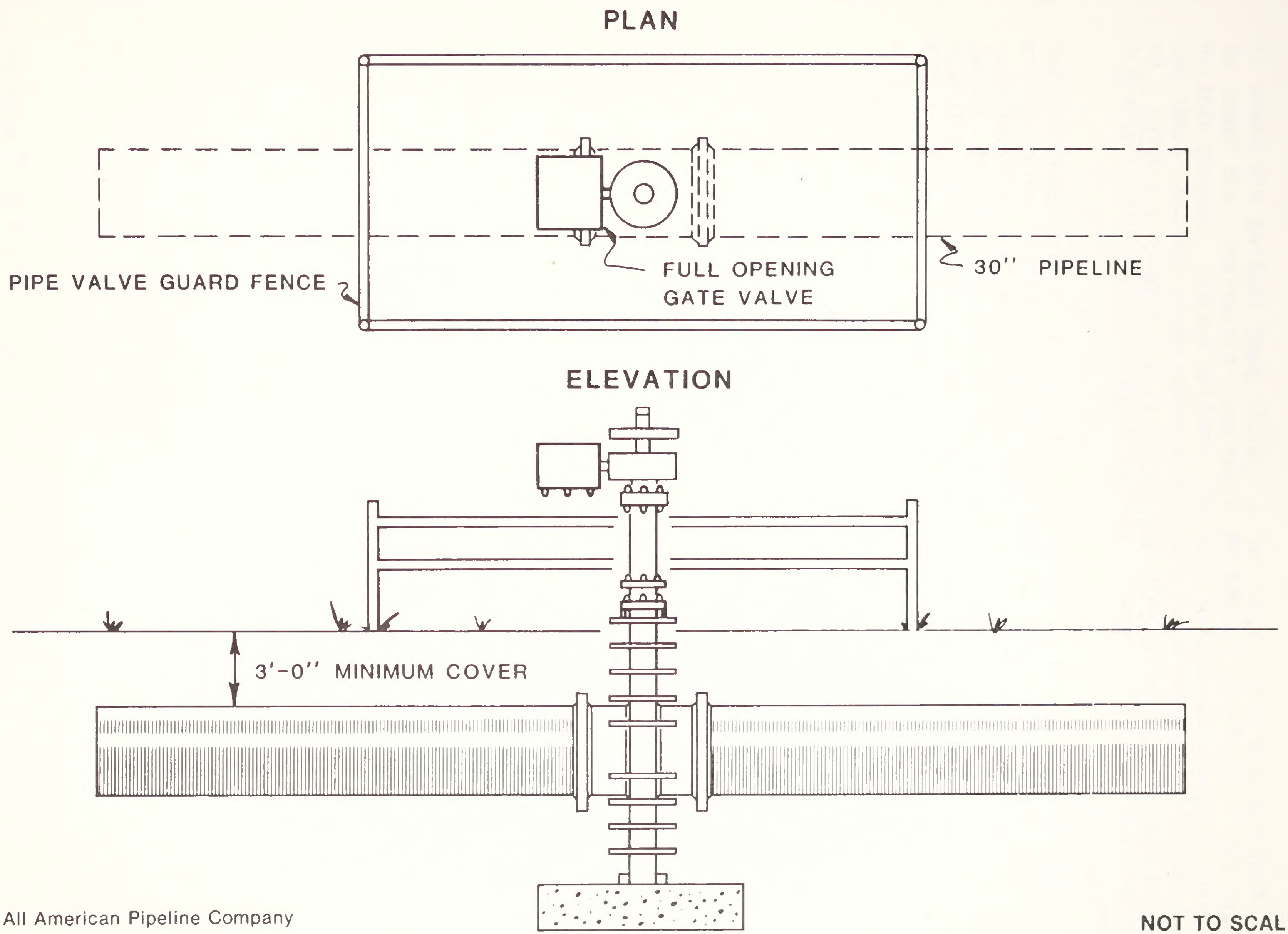
UTILITY REQUIREMENTS FOR THE CELERON/ALL AMERICAN AND GETTY PIPELINES

Pipeline Station	Electricity		Natural Gas	
	Source	Length of Tap	Source	Length of Tap
Getty				
Gaviota	existing	NA[1]	existing	NA
Sisquoc	PG&E	13.5 miles	not needed	NA
Cuyama	PG&E	0.9 mile	PG&E	~3 miles
Emidio	existing	NA	not needed	NA
Celeron				
Las Flores	existing	NA	not needed	NA
Gaviota	existing	NA	not needed	NA
Sisquoc	PG&E	12 miles	not needed	NA
All American				
Emidio	PG&E	0.5 mile	SCG	1 mile
Tejon	PG&E	20 miles	not needed	NA
Twelve-Gauge	SCE	0.3 mile	PG&E	200 feet
Cadiz	SCE	37 miles	PG&E	7 miles
LaPaz	onsite gas turbines	NA	El Paso	200 feet
Gila	onsite gas turbines	NA	El Paso	200 feet
Coolidge	onsite gas turbines	NA	El Paso	200 feet
Tom Mix	onsite gas turbines	NA	El Paso	200 feet
Hot Springs	onsite gas turbines	NA	El Paso	200 feet
Lordsburg	Texas-New mexico	8 miles	El Paso	200 feet
Anthony	El Paso Elect.	1.4 miles	El Paso	200 feet
Salts Flats	Rio Grande	0.1 mile	El Paso	200 feet
Wink	Texas-New Mexico	0.4 mile	El Paso	1 mile
Crane	existing	NA	not needed	NA
McCamey	existing	NA	not needed	NA

Source: Getty and Celeron/All American

[1]Not Applicable

Key:
- El Paso - El Paso Natural Gas Company
- El Paso Elect. - El Paso Electric Company
- PG&E - Pacific Gas & Electric
- Rio Grande - Rio Grande Electric Cooperative
- SCE - Southern California Edison
- SCG - Southern California Gas Company
- Texas-New Mexico - Texas-New Mexico Power Company



Source: All American Pipeline Company

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FIGURE 2-1 TYPICAL BLOCK VALVE INSTALLATION

Profiles and plot plans for a typical pump station are shown in Figure 2-2. Table 2-5 shows the locations, elevations, and types of pipeline stations associated with the pipeline system. Sisquoc station would be 400 ft by 600 ft and occupy 5.5 acres, while the Las Flores and Gaviota stations would be only 200 by 300 ft and require 1.5 acres. On All American's pipeline segment, each pipeline station would require 5.5 acres.

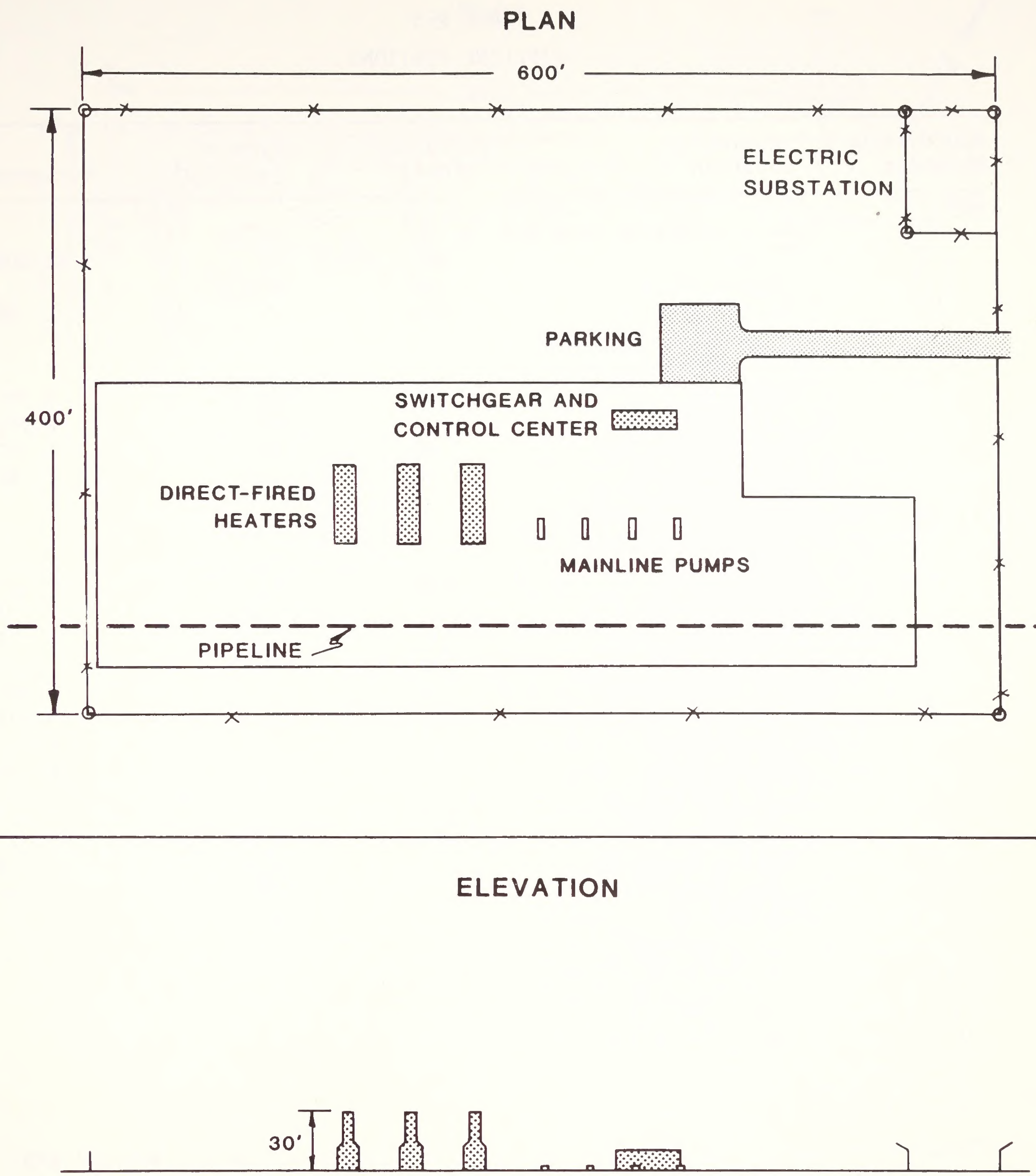
Each station would be designed in a booster station configuration utilizing centrifugal pumps in series. Normal operation would require three 2,500-horsepower (hp) high efficiency electric motor-driven pump units. One additional 2,500-hp unit would be installed at each station to provide standby pumping capacity. Three 30-million BTU/hour direct-fired heaters would be installed in parallel at each of All American's electric pump/heater stations and at the one heater station; two would be used in normal operation with the third serving as standby. Heaters would be designed to heat the oil to a maximum of 160°F. Electricity and natural gas would be purchased from local utilities along the pipeline route (see Table 2-4).

At locations where adequate electrical power is not available or is uneconomical, three 3,500-hp gas turbine-driven pump units would be installed. Two turbine units would be required in normal operation, while the third would serve as a standby unit. At stations where the pumps would be turbine-driven, the exhaust gases from each turbine would be used in conjunction with companion heat exchangers to maximize overall energy efficiency. This heat utilization would not eliminate the direct-fired heater function, but would reduce their required size and number. Two 30-million BTU/hour direct-fired heaters would be installed in parallel ahead of the turbine driven pumps; one to be used in normal operation, and the second to serve as a standby.

A leased, above-ground relief tank would be provided at the Emidio station due to elevation differences. The pipeline has been designed to handle surge at all other locations by thicker wall pipe and proper control.

The pumping units would be equipped with monitoring systems (e.g., bearing temperature and pump vibration) to provide advance warning of impending equipment failures. All locations would be served by electrical power or generators at turbine stations. The control panel and switchgear would be housed in a prefabricated, prewired building which would also house the communications equipment, supervisory control system equipment, and fire-fighting and emergency equipment. The control building would be approximately 26 ft by 12 ft. The site would be fenced and lighted, and have a security system. Lighting would only be turned on when personnel were present. No communication towers would be required.

A 20-acre tank farm is proposed at All American's tie-in with the existing Four Corners Pipeline at Cadiz (Figure 2-3). This facility would contain both delivery and injection stations and would be designed to increase the flexibility of the operation of the crude oil transportation system in southern California by allowing the



NOTE: NOT ALL PUMP STATIONS WOULD CONTAIN DIRECT-FIRED HEATERS.

Source: All American Pipeline Company

FIGURE 2-2 PLOT PLAN AND PROFILE FOR TYPICAL CELERON/ALL AMERICAN PUMP STATION

TABLE 2-5

PIPELINE STATIONS

Approximate Milepost	Station/ Location	Elevation (Feet)	Type of Facility[1]	Horsepower
Getty				
0	Gaviota Marine Terminal	50	EP/IS	
32	Sisquoc	800	EP	31,000[2]
76	Cuyama Valley	2,100	EP/HS[3]	
113	Emidio	430	DS	NA
Celeron				
0	Las Flores	50	EP/IS	6,702
10	Gaviota	50	EP/IS	6,702
37	Sisquoc	700	EP	6,702
122	Emidio	430	DS	NA
All American				
0	Emidio	430	EP/HS/IS	5,442
22	Tejon	1,850	EP	6,396
104	Twelve-Gauge Lake	2,280	HS	NA
213	Cadiz	800	EP/HS/DS/IS	6,731
303	La Paz	900	TP/HS	5,510
410	Gila	860	TP/HS	5,865
490	Coolidge	1,600	TP/HS	5,931
515	Tom Mix	3,350	TP	6,212
573	Hot Springs	4,400	TP/HS	6,100
672	Lordsburg	4,340	EP/HS	5,380
793	Anthony	4,000	EP/HS	5,931
882	Salt Flats	3,900	EP/HS	3,224
1,003	Wink	2,810	EP/HS/DS	2,601
1,061	Crane	2,530	DS	NA
1,084	McCamey	2,460	DS	NA

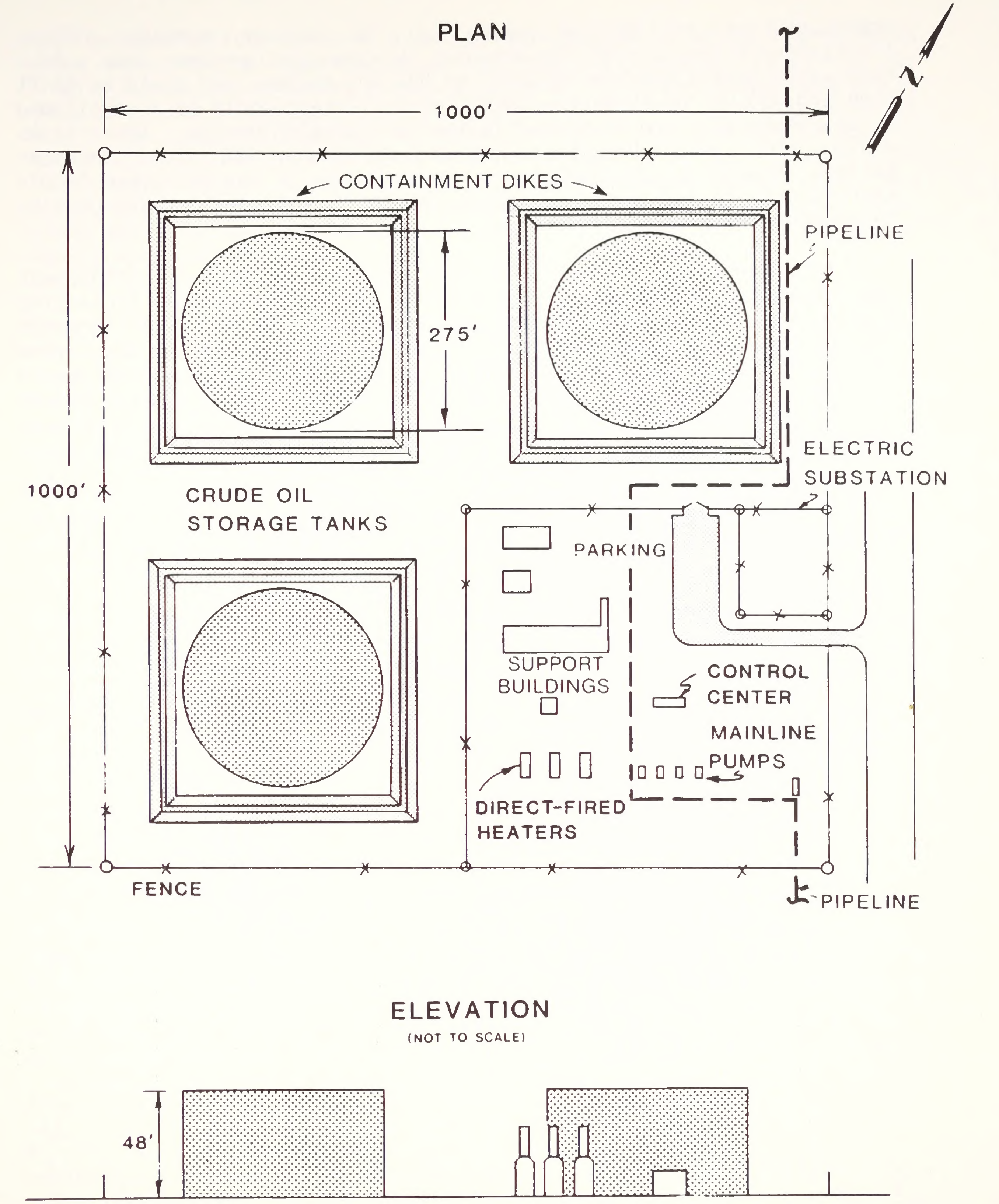
Source: Celeron and All American ROW Applications

[1]EP = Electric Pumping Station
TP = Turbine Pumping Station
HS = Heating Station
DS = Delivery Station
IS = Injection Station

[2]Total horsepower assuming a 30-inch, non-insulated pipeline and 400,000 BPD throughput. Getty would require greater horsepower due to greater oil throughput.

[3]Heaters needed only for a 30-inch pipeline with 300,000 BPD throughput.

NA = Not Applicable



Source: All American Pipeline Company

FIGURE 2-3 PLOT PLAN AND PROFILE FOR CADIZ TANK FARM

transportation of Alaskan crude oil to eastern markets. Three floating-roof tanks would be erected on compacted earthen pads. Each tank would have a working capacity of 500,000 barrels and would be 48 ft high and 275 ft in diameter. Overflow protection would be accomplished by an automatic alarm installed in the tank gauging device. These tanks would comply with Department of Transportation (DOT) and American National Standards Institute performance standards for petroleum liquid storage vessels and the requirements of the San Bernardino Air Quality Management District.

The tank farm would be designed to meet secondary containment requirements established by the DOT and the National Fire Protection Association. A containment dike approximately 6 ft high would provide 125 percent containment of each tank, and access ramps would be provided for service vehicles. The surface enclosed by the earthen dikes would be graded to direct the flow of storm water into a catch basin at one end. Collection sumps and pumps would be installed for areas around pumps, scraper traps, and meters where contamination with oil could occur. A Spill Prevention Control and Countermeasure (SPCC) Plan would be prepared for the storage area using guidelines set forth by the EPA (40 CFR 112.7) (see Appendix H). Portable fire extinguishing systems would be used at the tank farm area, and a fire-fighting plan would also be prepared for the tank farm (see Appendix I).

Electric power for the Las Flores and Gaviota pump stations would come from transmission lines adjacent to the sites. Southern California Edison plans to upgrade or add additional transmission lines to its existing system to service the power requirements of Getty, Celeron, and other planned future developments. Electric power for the Sisquoc pump station would come from one of three possible sources currently being evaluated. The shortest route would involve a new 4-mile 115-kV transmission line to an existing line in the Solomon Hills. Another option would be a 9-mile route connecting with the existing Zaca substation. The Zaca substation would have to be upgraded to service this new load. Finally, a new 12-mile transmission line along the Santa Maria Canyon Alternative pipeline route and up the Cuyama River could tie into an existing 115-kV line servicing Santa Maria. If this third option were determined to be the most feasible, the new powerline would be constructed within the pipeline ROW for about 5 miles. The Emidio pump station would receive electric power from an existing transmission line one-half mile east of the pump station. A 70-kV line would be constructed to connect the pump station to the existing line. The Tejon pump station would obtain electric power from one of two existing transmission lines. The shortest route would involve constructing a substation to convert power from an existing 330-kV line that runs north and south across the Tejon Hills adjacent to the pump station. The other option would be to construct 20 miles of new 70-kV or 115- kV transmission line from the Emidio pump station. The new transmission line would lie within the proposed pipeline ROW for its entire length. The Twelve-Gauge Lake pump station would receive power from an existing 33-kV line which parallels Highway 58. A short tap (less than 1 mile) would tie into the pump station. The Cadiz tank farm would receive electric power from the Camino substation near Fenner, California. A new 37-mile 66-kV powerline would be constructed from the pump station following the Four-Corners pipeline ROW and an existing transmission line ROW. Natural gas needed at the pump station would require a new 7-mile tap to an existing pipeline north of the pump station (Map 1-2). Pump stations in Arizona would be powered by natural gas turbines, gas would be supplied by the El Paso Natural Gas Pipeline which is paralleled by the proposed All American pipeline across Arizona. The Lordsburg, Anthony, Salt Flats, and Wink pump stations would require new construction of 8, 1.4, 0.1, and 0.4 miles of 115-kV transmission lines from existing systems. Power for the Crane and McCamey pump stations would come from existing distribution lines at the sites.

2.2.1.2 Getty. The Getty Trading and Transportation Company (Getty) proposes to construct a buried pipeline that would transport 100,000 to 400,000 BPD of crude oil. The pipeline would begin at Getty's existing marine terminal facility at Gaviota, parallel the north side of US 101 west to the Gaviota Pass area where it would turn north and parallel the west side of US 101, passing on the east side of Buellton (see Map 1-2, sheets 2 and 3 at the end of this document). The pipeline would cross the Sisquoc River, enter LPNF at La Brea Canyon, and descend the north side of the Sierra Madre Mountains into the Cuyama Valley. The corridor would then turn east and generally parallel the north side of California State Highway 166 into Kern County and terminate at the existing Emidio pump station (operated by Mobil and Texaco) in the southern San Joaquin Valley. Construction costs of Getty's pipeline would range from $56,900,000 to $93,500,000 depending on the size of the pipeline while annual operating costs would range from $10,900,000 to $15,000,000. The proposed pipeline system would consist of the following components:

- 113 miles of 20 to 30-inch pipeline with cathodic protection systems,
- 17 block and check valves,
- 2 to 3 pump stations.
- 1 delivery station (Emidio).

No new access roads would be required for the pump stations. Existing dirt roads would be upgraded for all-weather use. Utility requirements for the Getty pipeline are shown in Table 2-4.

Pipeline size would be dependent upon the predicted crude oil production volume from the pipeline service area and is as yet undetermined. Sizes under consideration are 20, 24, and 30-inch diameter pipe. The maximum pipe thickness would be 0.5 inch, and the maximum expected operating pressure would be 2,160 pounds per square inch gauge (psig) at the discharge of the Sisquoc pump station located near the mouth of La Brea Canyon. The oil at the inlet of the pipeline would be heated to approximately 160°F. The temperature would decrease as the oil moves through the pipeline to Emidio station. For a 20-inch pipeline transporting 100,000 BPD, rigid foam-filled insulating coating would be used on the pipeline. Two inches or more of polyurethane foam insulation would be injected under an extruded polyethylene outer jacket to form the coating system. Coating would be completed before transporting the pipe to the construction site. For a 30-inch pipeline transporting 400,000 BPD, the pipe would not be insulated. Where the pipe is not insulated, it would be coated with a double wrap of plastic tape. Concrete coating would be used at river crossings as necessary.

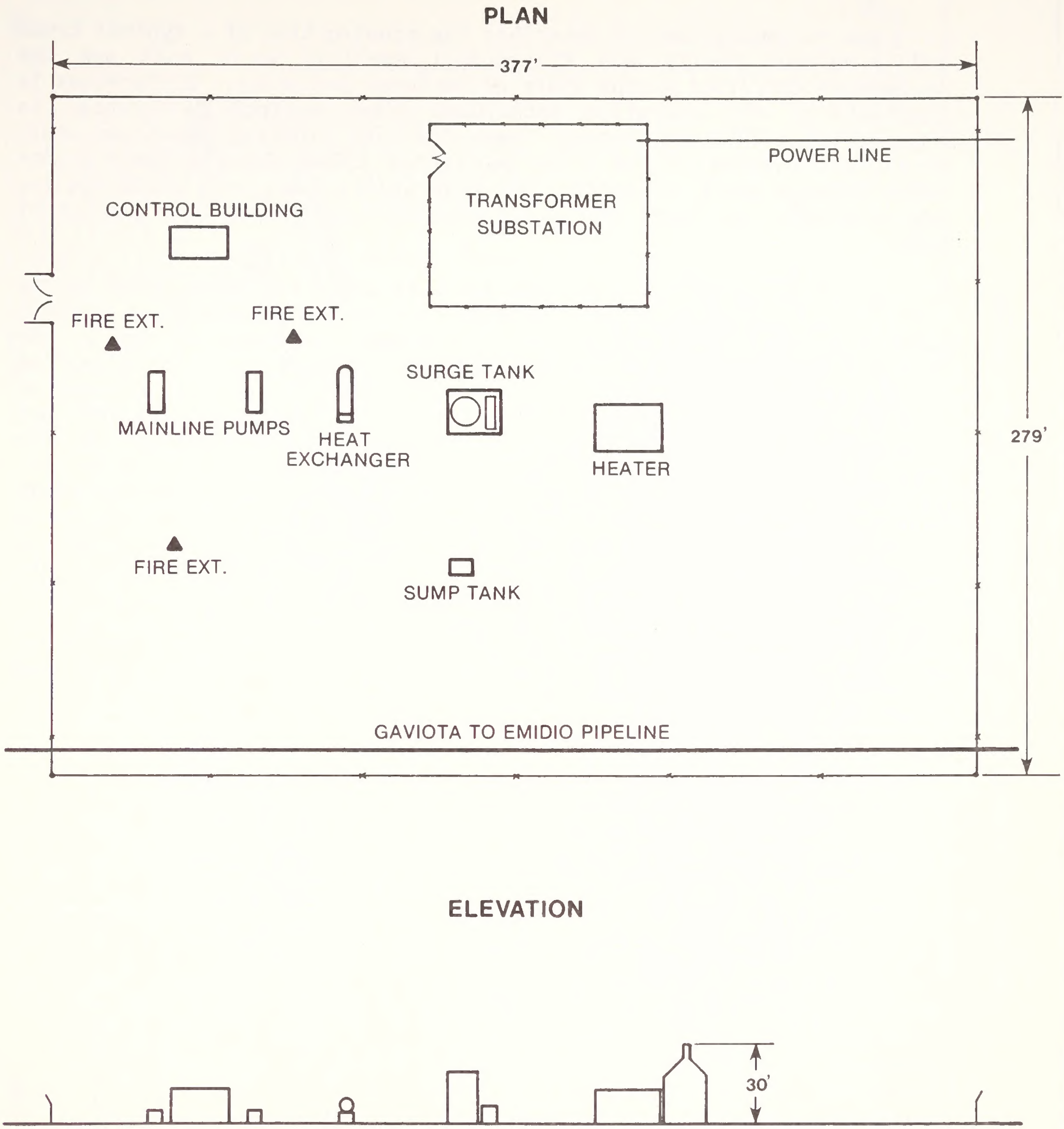
The entire pipeline would be protected from corrosion with a cathodic protection system consisting of groundbeds and rectifiers. The number and location of these systems would be based on tests of pipe-to-soil potential after construction. Corrosion protection test stations would be installed at least every 10 miles to test the performance of the cathodic protection system. These stations are about the size of a parking meter and would be within the ROW.

Pipeline block and check values would be located at strategic locations along the route (see Map 1-2). All of Getty's block valves would be remotely operated. Check valves would be installed on the downstream side of all major stream crossings, and block valves would be installed on both sides of all pump stations. Each block valve would require an area approximately 10 ft by 20 ft. A typical installation is shown in Figure 2-1.

A minimum of two and a maximum of three pump stations would be required (see Table 2-5). It is anticipated that each would employ electrically driven pumps to power the oil flow. The size of the pump stations would vary from one 1,000 hp to three 5,000-hp units depending on the design flow rate. Each station would require approximately two acres of land and a short access road (see Figure 2-4). The pump stations would be equipped with sensors to monitor operating parameters such as pressure, temperature, and vibration. All pump stations would contain fire-fighting and other emergency equipment. The stations would be fenced (6-ft high) and lighted for security and safety. Pump stations could include a microwave communication tower. Proposed pump station locations are shown on Map 1-2.

For a 30-inch pipeline with a throughput of 300,000 BPD, additional heating of the oil between Gaviota and Emidio would be required. Under this scenario, a single, 60-million BTU/hour, gas-fired heater would be included at the Cuyama pump station in San Luis Obispo County. This heater would raise the temperature of the oil for efficient transportation to the Emidio station.

Electric power for Getty's Sisquoc pump station would come from the same sources as described for Celeron/All American but would require about 1.5 miles of additional transmission line, a total of 13.5 miles for the longest option. Electric power for Getty's Cuyama pump station would require construction of about 1 mile of new transmission line from the pump station east to an existing transmission line. The transmission line would follow the pipeline ROW to the pump station. Natural gas for the Cuyama pump station would come from PG&E's existing network and require a tap about 3 miles long; an exact tie-in location has not been identified.



Source: Getty Trading and Transportation Company

FIGURE 2-4 PLOT PLAN AND PROFILE FOR TYPICAL GETTY PUMP STATION

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2.2.2 Pipeline Construction

The following section describes the construction of a typical crude oil pipeline. Getty and Celeron/All American would both use the techniques described except where differences are noted. Differences in construction and operation techniques often reflect differences in engineering philosophy between companies. The proposed pipelines would be built beginning in the first quarter of 1985. Getty's construction would require about six months, and Celeron/All American's would require approximately two years and would be completed in the last quarter of 1986.

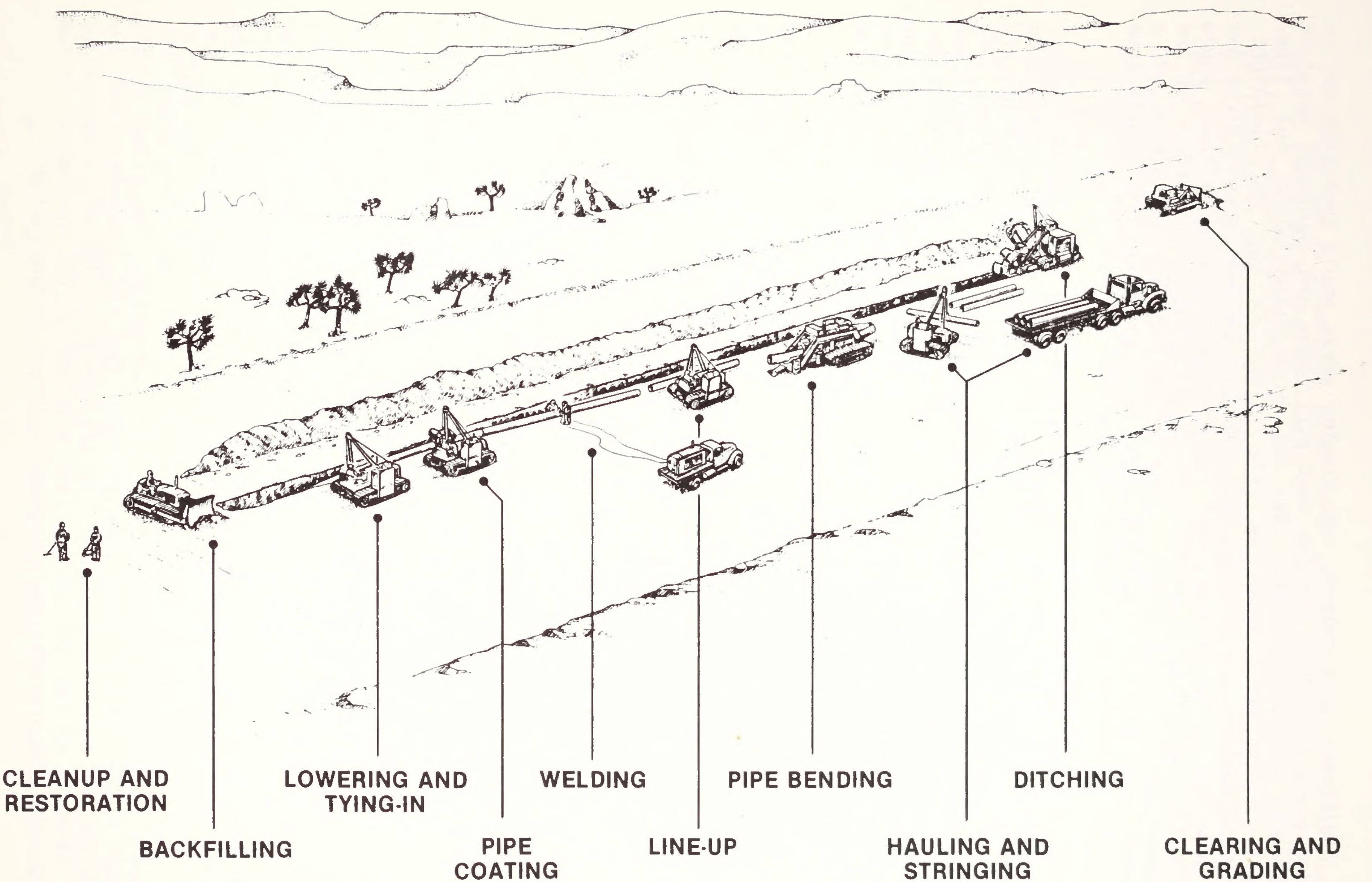
Construction of the proposed projects would be accomplished by the use of several construction spreads working concurrently on various portions of the pipeline system. The spread team would be responsible for all aspects of construction along their segment, with the exception of specialized highway and river crossings. The number of spreads utilized per applicant would be three for Getty, one for Celeron, and five for All American. Figure 2-5 typifies a cross-county pipeline spread. The construction ROW width for the applicants would be 100 ft. Where feasible as determined by the Authorized Officer, a smaller width would actually be used. The permanent (operation) ROW width would be 20 ft for Getty and 50 ft for Celeron/All American. Table 2-6 shows the manpower requirements for a typical cross-country pipeline spread, and fuel and lubricant requirements are presented in Section 2.13. Construction would progress at an average of 1.5 to 2 miles per day per spread. In rugged terrain, construction would progress at about 0.5 mile per day. Construction would take place between 7 a.m. and 5 p.m. six days per week.

TABLE 2-6

PERSONNEL REQUIRED FOR TYPICAL CONSTRUCTION SPREAD

Classification	Number Required		
	Getty	Celeron	All American
Superintendents	1	1	1
Spread Manager	1	1	1
Foreman	2	12	15
Operators - Mechanics	10	112	125
Teamsters	7	27	35
Welders	9	27	35
Workers Helpers	10	35	45
Laborers	15	60	74
Office-Warehouse	1	4	4
TOTAL	56	279	335

Sources: Getty 1983a, Celeron Pipeline Company of California 1983, and All American Pipeline Company 1983.



Source: ERT

FIGURE 2-5 TYPICAL PIPELINE CONSTRUCTION SPREAD

Additional pipe storage and staging areas would typically not be needed along the ROW. For the most part, pipe and equipment would be delivered directly to the ROW and distributed along the line. Contractor equipment would be left parked in the ROW overnight. Equipment would not be shuttled back and forth between staging areas and the pipeline. The minimal need for storage and staging areas would likely be supplied by a contractor's existing facilities and/or by the proposed pump station sites. Pipe would probably be stored at a proposed pump station site that would be cleared but not constructed until its usefulness as a staging area is over (Getty).

Each pipeline construction spread would be made up of several units, each having a separate function. The units would be organized to proceed with the work in the following general order: clearing and grading the ROW; ditching; hauling and stringing the line pipe; pipe bending, line-up, and welding; applying protective coating; lowering and tying in; backfilling; testing; and ROW cleanup and restoration. Special construction crews would consist of fence building, road and railroad boring for casing pipe, water crossings, block valve installation, and station construction. The various pipeline construction activities can be generally described as follows:

2.2.2.1 Preconstruction Activity. The major field operations prior to construction would be ROW acquisition and surveying. The right to construct, operate, and maintain the pipelines would be obtained primarily by purchase or permit from landowners and responsible agencies. In most cases, ROW agreements provide that the pipeline company may survey; clear by cutting timber, brush, and crops to a specified width; construct the pipeline; restore the surface so that the owner's usual use of the land may be continued; and have access to the pipeline for future operation and maintenance. Sometimes the land may be purchased by the pipeline company. Most often the location of the pipeline is described by a surveyed center-line description of its route across each piece of property. Permits would be obtained as required for crossing railroads, highways, roads, streets, rivers, canals, irrigation or drainage ditches, and various other facilities. Ground survey crews would plot all topographic features which could affect the laying of the pipeline.

The Celeron/All American pipeline would be a common carrier for crude oil. The Getty pipeline would be a private carrier and, thus, would not have the same rights as a common carrier. Common carriers have the right of eminent domain. Under eminent domain, a common carrier may file a request for condemnation to obtain ROW from a private land owner that is unwilling to provide an easement. Before filing, the common carrier must exhaust all means of private negotiations. If the landowner turns down the carrier's "best and final" offer, the carrier may start condemnation proceedings by filing with the County Clerk. An appraiser appointed by the court then determines the value of the required ROW. These costs are escrowed for the landowner, and the pipeline may then be constructed by the carrier. The court determines the fairness of the carrier's offer, provides a just settlement to the landowner, and provides the permanent easement to the carrier.

After ROW is obtained, landowners, permittees, and regular users of public lands along the ROW would be notified in advance of construction activities that could affect their business or operations. Notification to landowners would be by mail. Local permittees and tenants would be notified in person a few days ahead of construction. Other notification would be made by various means, including placing signs at road crossings in advance of construction. Ranchers would be advised of any fence openings, disturbances to range improvements, or other range-use related structures in advance of construction.

2.2.2.2 Clearing and Grading the ROW. The construction crew would install temporary gates in all fences that cross the ROW. Adequate bracing would be installed at each edge of the ROW prior to cutting the wires and installing temporary gates. If a natural barrier used for livestock control is damaged during construction, the applicant would adequately fence the area to prevent the escape of livestock. The opening would be controlled as necessary during construction to prevent the escape of livestock; upon completion of construction, the applicant would reconstruct the fence to its original condition. No gates or cattleguards on established roads over public land would be locked, blocked, or closed by the applicant. Any cattleguard damaged by the applicant would be repaired to its original condition or replaced.

Clearing would include removal of above-ground obstacles to construction such as trees, brush, crops, and boulders. Clearing would also include removal of tree stumps and roots in the ditch line that would interfere with operation of the ditching machine. Large trees would be sawed into manageable or marketable lengths and stacked or removed from the ROW, as directed by the land owner or land managing agency.

Grading would include leveling the ground surfaces as required to permit transit and operation of vehicles and equipment and to permit placement of the pipeline at the desired elevation. In general, the pipeline would follow the terrain and deep cuts would not be necessary. Grading and cut-and-fill excavation would be performed in such a manner as to minimize effects on natural drainage and slope stability. On agricultural lands, the area would be restored upon completion of construction to resemble the original grade. Excavation and grading may be performed to increase the stability and decrease the gradient of unstable slopes. Construction of roads and bridges, temporary diversion of streams, stabilization of soil to support heavy equipment, and various other kinds of work would also be needed.

There are several disposal procedure possibilities for vegetation and rocky soil cleared during pipeline installation. Potential disposal procedures would include:

- Bury vegetation and rocky soil at earth fill locations, if available, along the pipeline ROW or offsite area(s) as long as it would not result in soil erosion.

- Dispose of vegetation and rocky soil at a landfill or private source.

- Burn vegetation in a designated area approved by the appropriate governing agency and under the proper atmospheric conditions.

- Chip brush, branches, and trees (less than 4 inches in diameter) and spread on or adjacent to the pipeline ROW.

- Trees larger than 4 inches in diameter would be cut to manageable length and stacked along the ROW for the landowner.

2.2.2.3 Ditching. Once the ROW has been prepared, normal ditching operations would begin. A standard dimension ditch, from a minimum of about 5 ft to a maximum of about 8 ft wide, would be centered on a line about 33 ft away from one edge of the ROW thus providing about 67 ft of working space and 33 ft of area in which to place ditch spoil (Figure 2-6). Where soil depth exceeds 6 ft, the ditch would be excavated mechanically with ditching machines. In areas where loose or unconsolidated rock is encountered, the ditch would be excavated using backhoes and clam shell buckets. An exception to the mechanical excavation would be hand-digging to locate buried utilities, such as other pipelines and cables.

Some selective, directionally controlled blasting of rock in the ditch line could be done; however, none is anticipated at this time. If blasting is necessary, the following safety precautions would be adhered to:

- Directional low-grade charges would be used such that shock effects would not propagate any further than the immediate ROW.

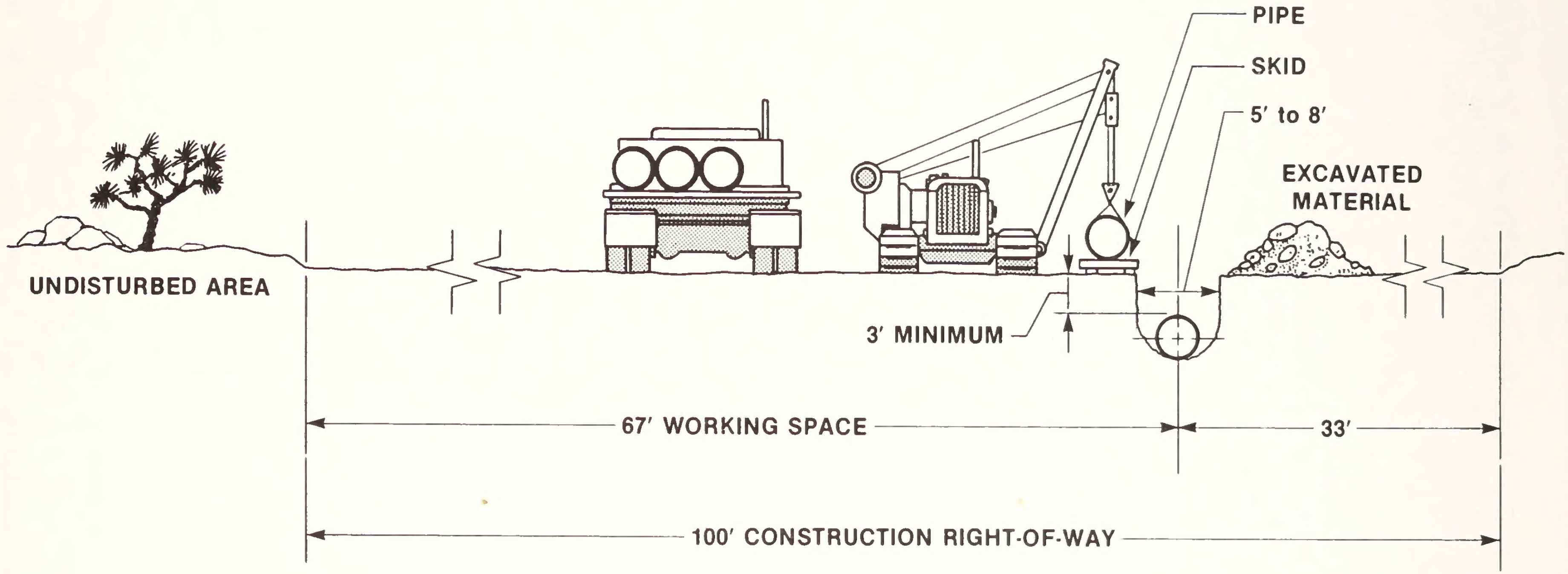
- In areas of human use, shots would be blanketed (matted).

- Landowners or tenants in proximity to the shot would be notified in advance so that livestock and other property could be adequately protected.

- Before detonation, a clearance would be made to ensure that construction personnel and equipment and local residents are in no danger.

- Fire protection measures would be implemented.

The depth of the ditch would vary with the conditions encountered. Depths would be in conformance with DOT standards (49 CFR 195, Transportation of Liquids by Pipeline). The cover from the top of the pipe to the ground level would be a minimum of 3 ft thick. When the pipeline traverses areas for which there are definite plans to level the land for irrigation or other purposes, the pipe would be buried at a depth that would permit the land to be leveled. When crossing canals, borrow ditches, or irrigation ditches that are dredged to maintain depth, the pipeline ditch would be excavated to a depth that would permit safe dredging operations. At railroad and road crossings, the depth of the ditch would conform to appropriate regulations. At these



Source: ERT

NOT TO SCALE

FIGURE 2-6 CROSS-SECTION OF PIPELINE CONSTRUCTION RIGHT-OF-WAY crossings, the applicants' specifications require a minimum of 4 ft of cover over the pipe at the bottom of the roadside ditches. (Special construction descriptions for crossings are covered under item 11.)

2.2.2.4 Hauling and Stringing. Pipe-stringing trucks would be used to transport the pipe in 40 to 80-ft lengths from shipment point or storage yards to the pipeline ROW. As the trucks carry the line pipe along the ROW, sideboom tractors would unload the joints of pipe from the stringing trucks and lay them end to end beside the ditch line for future lineup and welding. Turnaround areas for the stringing trucks would be provided along the construction ROW.

2.2.2.5 Pipe Bending, Laying, and Welding. The pipe would be bent by a bending machine to conform to the terrain and fit the contour of the ditch both vertically and horizontally. ROW conditions sometimes require pipe bends of such short radius that field bending is not practical. In these cases manufactured or shop-made bends would be used.

Laying the pipe would include internal lineup and holding in position until the first welding pass is complete. It would then be lowered onto skids or blocks. Internal lineup clamps would be used to align the pipe joints whenever possible with external clamps being used only on tie-ins of long pipe sections.

Following the line-up crew, the welding crew would apply the remaining weld passes to bring the thickness of the weld to more than the thickness of the pipe by approximately 1/16-inch. Pipeline welds would be subjected to nondestructive tests including radiography (x-ray), magnetic particle inspection, and dye penetrant or ultrasonic tests. All girth welds to be placed beneath railroads, highways, and rivers would be radiographically inspected before installation. As a minimum, 10 percent of the welds made by each welder each day would be radiographically inspected.

2.2.2.6 Insulation and Protective Coating. After removal of all dirt, rust, and mill scale, a protective coating of overlapping layers of 20-mil vinyl tape would be applied. Areas to be insulated would receive 1.5 inches of insulation with a vinyl outer wrap. This would be applied at several field coating yards listed below (Celeron/All American). Getty's pipe would be insulated at the factory.

Oxnard, CA	Bouse, AZ	Gage, NM
Bakersfield, CA	Buckeye, AZ	Carne, NM
Mojave, CA	Casa Grande, AZ	Anthony, TX
Barstow, CA	San Manuel, AZ	Alfalfa, TX
Amboy, CA	Wilcox, AZ	Eagle Flat, TX
Rice, CA	Bowie, AZ	Pecos, TX
Blythe, CA	Lordsburg, NM	McCamey, TX

Company-approved methods of transportation and handling pipe would be rigidly followed to protect the insulation during stringing and construction activities. All weld-joint areas and any repairs would have field-applied insulation and outer wrap prior to lowering in and backfill operations.

Inspection of all phases of the coating operations would ensure that the applications conform to company and manufacturers' specifications. Any irregularities in the coating that would permit moisture to reach the pipe would be located by use of a "holiday" detector; all pipe would be tested prior to backfilling.

2.2.2.7 Lowering and Tying-in. The pipe would be lifted and lowered into the ditch by two or more side-boom tractors spaced so that the weight of unsupported pipe would not cause buckling or other damage. Cradles with rubber rollers or padded slings would be used so the tractors can lower-in the pipe without damage as they travel along the ditch line. Tie-ins would be required whenever there is a break in the continuous operation of the main-line pipe crews. This would occur at road crossings, water crossings, block valves, and other special locations. Tie-in welds are usually made in the ditch at the final elevation, and each weld requires pipe handling for line-up, cutting to exact length, pipe cleaning and coating, and backfilling, in addition to normal welding and weld inspection.

2.2.2.8 Backfilling. A variety of backfilling procedures would be used to perform the work effectively and economically and to comply with specifications regarding protection of pipe and coatings. Motor graders, angle dozers, and modern backfill machines would be used to move dirt from the spoil bank to the ditch. Where necessary, the backfilled earth would be compacted to avoid later settling. In certain areas where damage might occur to the pipe coating, protection would be provided by padding the ditch with clean sand or earth backfill. Any required padding material would be obtained from local commercial sources or private landowners.

2.2.2.9 Hydrostatic Testing. In addition to standard mill testing of all pipe and fittings, hydrostatic testing would be performed after construction and before the line is placed in service. The hydrostatic test would be conducted in accordance with requirements of DOT, Office of Pipeline Safety. The hydrostatic test involves filling the line with fresh water, increasing the pressure by means of a special pump, and pressurizing the test sections until a predetermined internal pressure is achieved. This pressure would be at least 1.25 times the pipeline operating design pressure. Such tests are designed to prove that the pipe, fittings, and weld sections would maintain mechanical integrity without failure or leakage under pressure. Water for hydrostatic testing would be purchased from private water owners and would be obtained from the California Aqueduct (Celeron/All American) and the canal system at Bakersfield (Getty). The estimated amount of water required for testing the pipeline would be 92 acre-feet for Celeron/All American and 9.6 acre-feet for Getty. This water would be reused as separate sections of the pipeline system are tested.

The test water would be disposed of near McCamey, Texas (Celeron/All American) and Bakersfield, California (Getty) in accordance with Federal, state, and local agency requirements. Prior to the disposal of hydrostatic test water, it would be sampled and analyzed to determine the level of contaminants. Water not in compliance with Federal or state water quality standards would be impounded in holding basins approved by the appropriate governing agency. The water would be held and treated as required in the area where discharge would take place.

Permanent records would be kept on each hydrostatic test. This record would indicate the exact location of the test segment, elevation profile, description of facility, and continuous pressure and temperature of line throughout the test. Deadweight testers would be used to verify accuracy of pressure-recording devices and charts during the test.

2.2.2.10 Cleanup and Restoration. ROW cleanup and restoration would conform to all applicable laws and guidelines of Federal, state, and local agencies having jurisdiction and to agreements with private property owners. The ROW would be cleaned up by removal and disposal of construction debris and surplus materials. Solid waste would be generated at a rate of 100 to 200 pounds per day per spread and would be disposed of at a state-approved landfill. Considerable restoration of the ROW surface would be accomplished during backfilling operations. A disc and other equipment would be used to break up clods and smooth the land surface where required. Tillable land would be restored so that normal cultivation can be resumed.

Temporary openings in fences would be removed, necessary gates installed, and fences restored to their original condition. Markers showing exact locations of pipelines would be installed at road and fence crossings. Markers would also identify owners of the pipeline and would contain other pertinent information required by the DOT. This includes type of material transported, owner of line, and telephone number of owner in case of emergency.

The following considerations would be applied in determining the restoration procedures:

- Disturbed areas would be restored as closely as practical to their original conditions before construction.
- Land use plans may allow for, or require, the restored areas to exhibit characteristics different from the preconstruction conditions.
- In cases of public land, all appropriate regulations and guidelines would be followed. Restoration of privately owned lands would be based on requirements of the landowner.
- The technique used in clearing and installation would often determine the techniques and extent of restoration required.
- The program of maintenance would determine the techniques and extent of restoration.

The most common available approaches to surface restoration include the following:

Removal of debris,
Surface contouring,
Water control structures,
Surface cultivation,
Mulching,
Application of soil amendments, and
Replanting.

In all land use types, restoration would follow pipeline construction specifications, beginning with the disposal of debris and the restoration of normal contour and surface soils. Surface contouring and terracing and water control structures would be used as diversions to concentrate and/or channel surface water flow and prevent soil erosion. Where appropriate, topsoil would be returned to cover the trench backfill material. Some areas would require that the soil not be turned over and that the topsoil be preserved separately and added to the very top of the ditch. Where necessary, mulching would be used to prepare seedbeds and control erosion. Fertilizers would be applied where appropriate. Revegetation programs would be based on agency guidelines.

Agricultural lands are usually privately owned. Therefore, restoration would be based on preconstruction agreements with the landowner. Restoration beyond normal cleanup procedures often is accomplished by the landowner during his normal agricultural operation.

Restoration of the ROW where it crosses a stream would emphasize stream-bank stabilization. This stabilization could involve mulches, seeding, seedlings, runoff diversion structures, and/or riprap.

Temporary access roads, staging and assembly areas, and other temporary installation support areas would be restored based on normal techniques of abandonment. Upon abandonment, such areas would be stabilized without undue delay, and the ROW would be returned to the owner or land manager.

Restoration of the pipeline ROW would be modified when coincident with or crossing other ROWs. Where existing pipeline or electric transmission line ROWs would be encountered, restoration programs would conform to those for the land use type on which the encounter occurs, to those of the pre-existing ROW, or to a program devised with the operator of the pre-existing ROW. The crossing of certain minor roads would be accomplished by an open cut. In such cases, restoration of the road margins would follow the above guidelines, and restoration of the roadway itself would conform to the laws, regulations, and guidelines of the government agency having jurisdiction, or to the needs of the land owner. Detailed restoration methods would be developed on a case by case basis.

2.2.2.11 Special Construction. Highway, Railroad and Pipeline Crossings. In most cases, roadbeds supporting roadways (including interstate highways) or railroads would be crossed by boring a hole horizontally from one side of the highway or railroad ROW to the other. The pipe would be installed immediately behind the cutting head as it advances. Steel casing would be used to encase road crossings where required by Federal, state, local, or railroad authorities. Figure 2-7 shows typical uncased and cased road crossings. An area 100 ft x 250 ft would be needed on the boring side of the road or railroad for the operation of boring and pipe-pushing equipment.

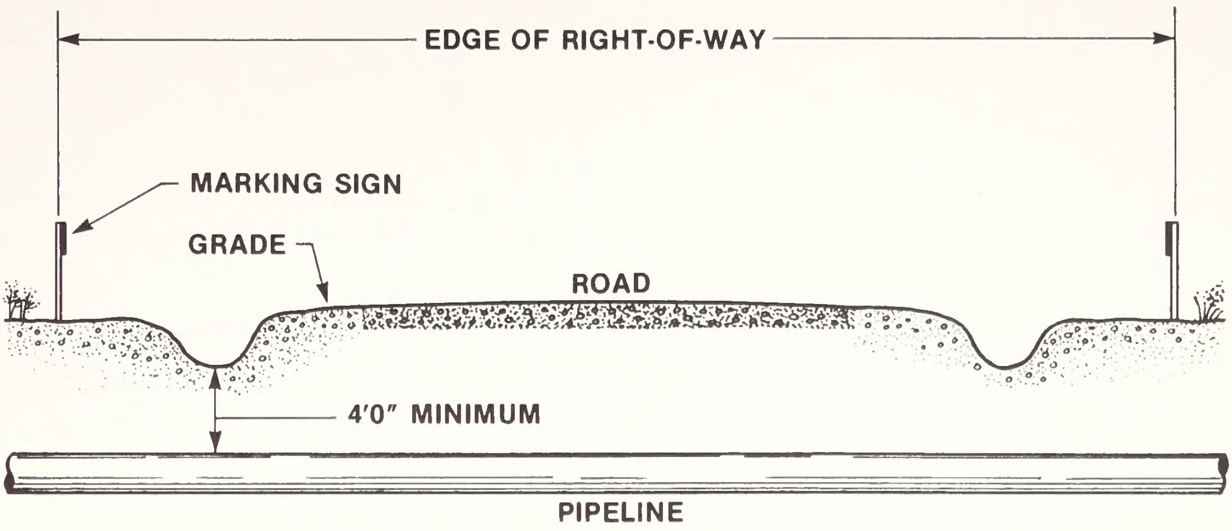
Minor unpaved roads would be crossed by ditching rather than by boring. Crossing of minor county, BLM, or Forest Service roads may require control of a minimal amount of traffic by short detours bypassing the construction area, proper signing, barriers, or flagmen. No roads would be closed for construction, and any disruption of traffic flow would be over in 1 or 2 days. Passage for emergency vehicles would be maintained at all times.

The Celeron/All American and Getty pipelines would be placed beneath all existing pipelines. Excavation and pipe placement would be by machine and hand depending on the pipeline to be crossed. These crossings would have a minimum of 12 inches of vertical clearance from the existing pipe and would not be cased.

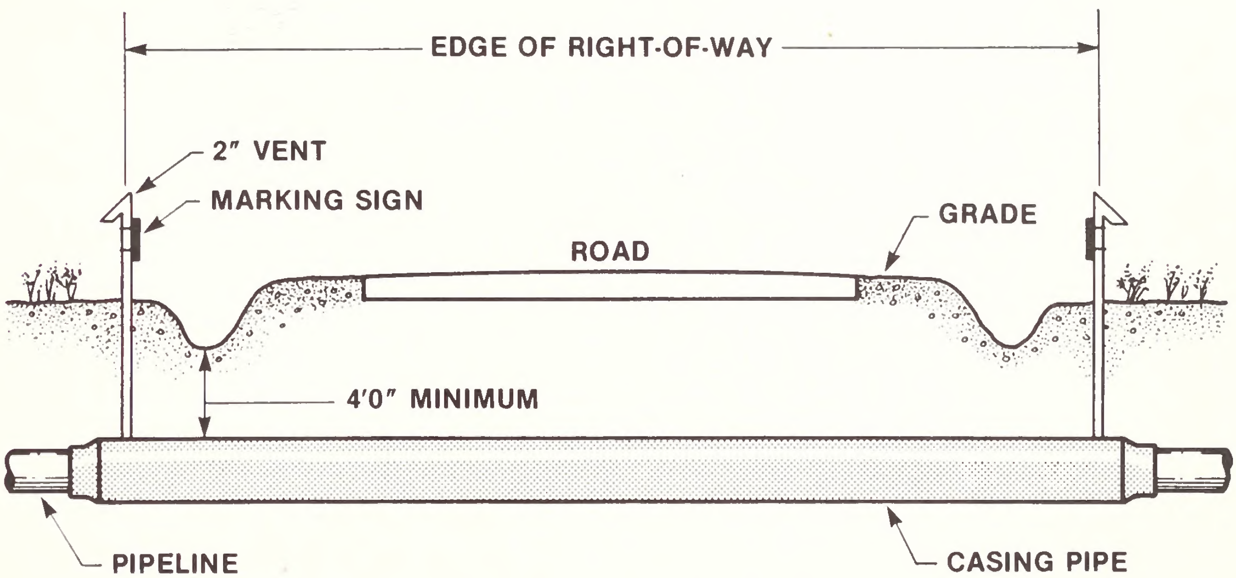
Water Crossings. The Getty and Celeron/All American pipelines would be buried at all water crossings, including named intermittent streams, except the California Aqueduct system near Emidio. Figure 2-8 shows the type of aerial crossing proposed for the Aqueduct.

The crossing would utilize a prefabricated pipe bridge. The pipe bridge would be hauled by truck to the crossing site in either one or two pieces depending on the width at the crossing and highway hauling regulations. The use of solid steel plate for the vertical members versus open webbing allows greater rigidity plus protection of the pipe itself from vandalism. In addition, the pipe would be inside casing such as used for "cased" road crossings. Special temporary land requirements for pipeline construction would be required for crossing rivers. For the major rivers, the depth of line and extra work equipment would require additional working space. Where required, these installations would double the width of the minimal working area for a total working area of 250 ft x 450 ft. This additional space would be required for about one month during the construction period.

For submerged crossings, the pipe would be buried in the stream or riverbed at a depth of 4 ft below the probable scour depth of a 100-year flood, per DOT regulations (see Figure 2-9). This would require specialized equipment to prepare the ditch, such as dredges, backhoes, and draglines. If the river bottom contained solid rock, drilling and blasting would be required to obtain the necessary ditch depth; the pipe would be buried 18 inches below the surface of the rock per DOT regulations. Blasting for water crossings, as on land, would be handled by expert personnel utilizing multi-holed, low-intensity charges sufficient to fracture only the rock without scattering debris over large areas.



UNCASED ROAD CROSSING

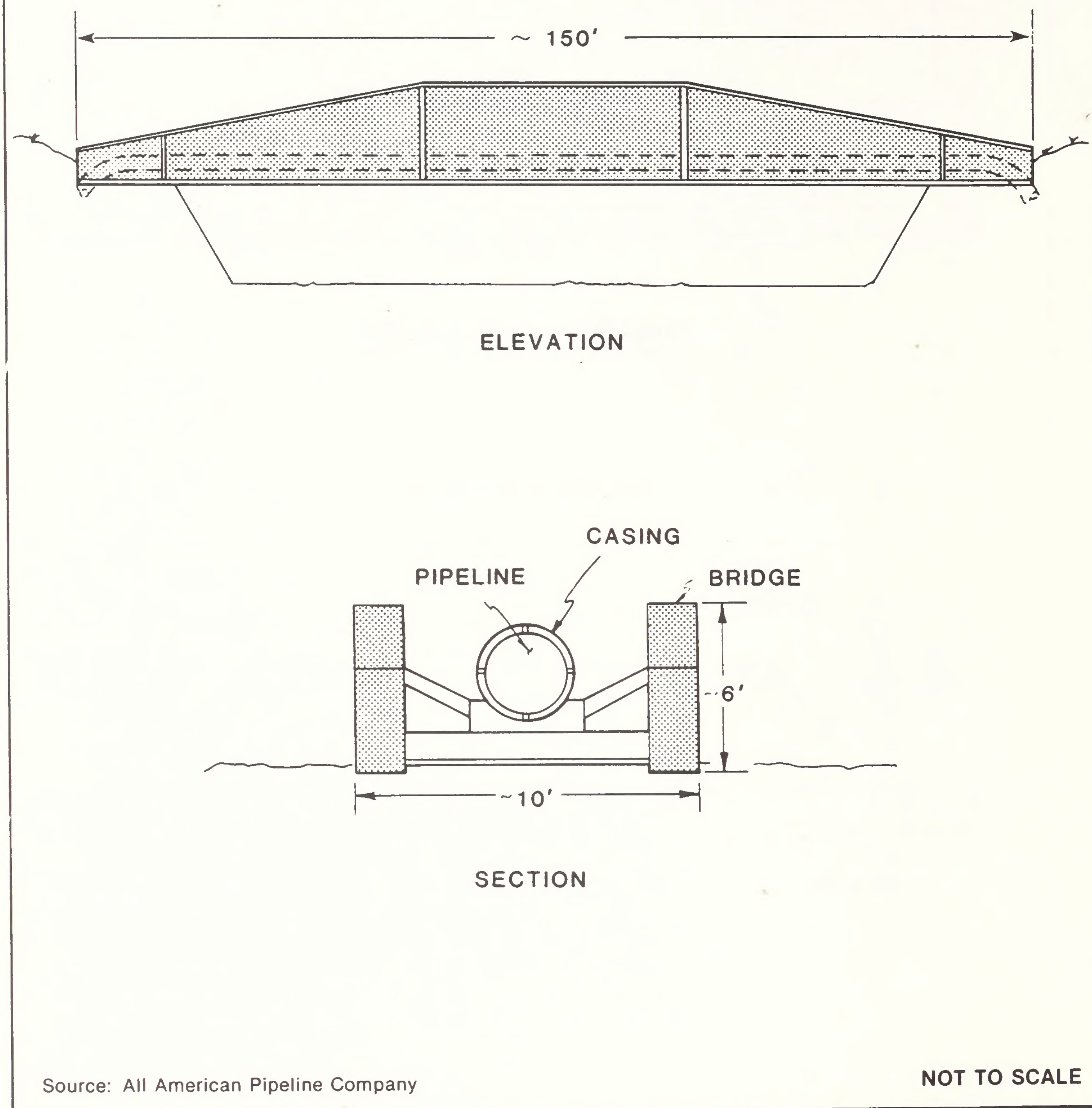


CASED ROAD CROSSING

Source: ERT

NOT TO SCALE

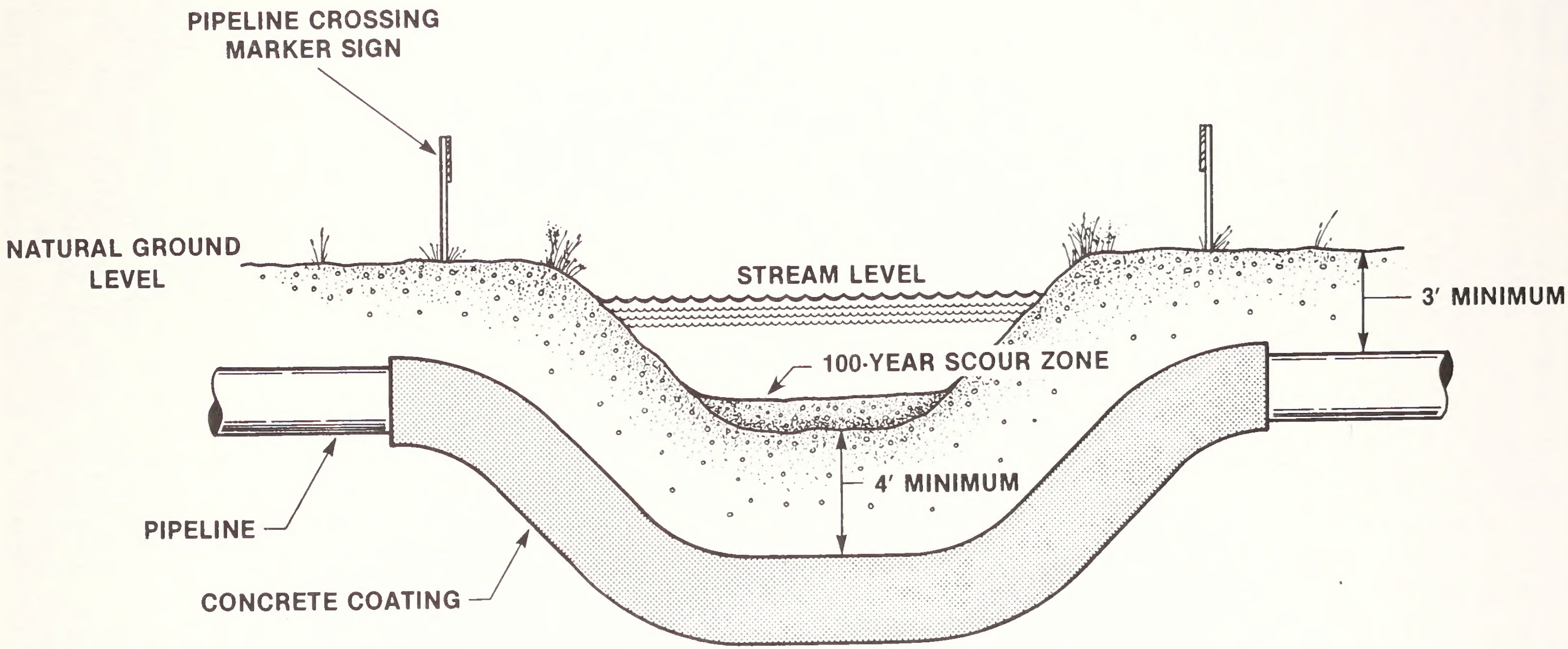
FIGURE 2-7 TYPICAL CASED AND UNCASED ROAD CROSSINGS.



Source: All American Pipeline Company

NOT TO SCALE

FIGURE 2-8 REPRESENTATIVE OVERHEAD CROSSING OF THE CALIFORNIA AQUEDUCT



Source: ERT

FIGURE 2-9 TYPICAL PIPELINE RIVER CROSSING

Construction procedures would include making up strings of pipe on land, examining the welds, applying protective coatings, adding weight in the form of concrete coating to the pipe to reduce buoyancy, and hydrostatically testing the pipe strings. All work to be done on the pipeline would be completed before installation in the stream, and care would be taken to avoid any construction debris falling into the stream. Retesting after installation would also be done.

Because of its width and depth, the Colorado River crossing (All American) would require extra working space for construction activities. A total of 12 acres of land would be needed temporarily for the Colorado River crossing in addition to that required for the upland approach to the river. The extra space would for the most part be confined to one side of the river, and would involve a corridor of land approximately 250 to 300 ft wide and 1,200 ft long. The crossing would require about six weeks of preparation and two days to pass the pipe across the River. The ditch would be approximately 80 to 90 ft wide at the riverbed surface and 16 to 18 ft below the riverbed.

All perennial stream crossings would be scheduled during the normal period of low streamflow. Intermittent streams would not be crossed during flow events. All crossings would be designed in conformance with applicable codes.

2.2.3 Pipeline Station Construction

Before actual construction of a pump station could begin, the site would be cleared of most vegetation and graded level. The task of welding and installing pipe, fittings, and other material would begin upon completion of grading. Foundations for the control center building and pumps would be poured along with any additional concrete work. Power lines from the local electric utility would also be routed into the electrical substation at this time. Pump stations would be painted earth tones to blend into the surrounding landscape and areas around the pump station would be bermed and planted to reduce visibility and noise. Construction of a typical pump station would require approximately 20 to 25 workers and a 4 to 6-month construction period. The workers would move in groups of three to ten persons to each site, e.g., earthwork crew, concrete crew, piping crew, etc.

2.2.4 Operation/Maintenance

2.2.4.1 Celeron/All American. Operation of the Celeron/All American pipelines would be in compliance with all applicable DOT, state, and local regulations and standards. Both pipelines would be operated by All American. All operating facilities for the pipeline system would be designed for unattended operation and remotely controlled from a main control center in Bakersfield, California where dispatching personnel would start and stop all equipment, open and close valves, set flow rates, and monitor all operations. Operating personnel (including management, administrative, dispatching, and maintenance personnel) would total 49 people for the system from Las Flores to McCamey. Twenty people would be located in the Bakersfield operations office and 29 would be located at maintenance bases along the pipeline route.

The pipeline design would include a supervisory control and surveillance system to provide 24-hour remote control and monitoring of all operations. The system would be comprised of a master station having hot-standby equipment and would be all solid-state, digital, continously scanning type that automatically scans or interrogates one or more remote terminal unit (RTU) groups in sequence.

Data collected would include equipment alarm and status information along with transmitted values for pressures, temperatures, flow rates, accumulated meter readings, tank levels, leak detection, vibration, and other operating information to ensure safe and efficient operation. A computerized event logger would chronologically record each operational event and a computerized information logger would record all operations reports as required. The master station would include an integrally programmed leak-detection system designed to adjust for variations in operating pressures, temperatures, and short-term changes in flow rate in and out of the pipeline.

Several methods of leak detection would be employed by Celeron/All American: 1) pressure deviation, 2) flow rate deviation, and 3) volumetric imbalance. These methods are discussed in detail in Celeron/All American's ROW application (pp. 5-12 through 5-18). All of these methods are effective in the detection of a large break such as might be experienced if an earth-moving machine should strike the pipeline. Such large leaks can be detected quite rapidly with a reasonably high degree of certainty. The maximum expected oil spill at a sensitive location would be 8,370 barrels (see Section 4.2.15 for additional details). The volumetric imbalance method is also effective in the detection of small leaks. The short-term leak detection threshold would be approximately 40 barrels per hour on a 6-minute time basis and 3 barrels per hour on a 12-hour time basis. A small leak could result in the loss of about 40 barrels of oil before detection. The pipeline dispatcher would immediately evaluate the situation and, at his discretion, shut down the pipeline. The operator would implement established procedures to locate the leak and notify appropriate authorities.

The pipeline communications system would ensure the transmission of information required for the safe operation and maintenance of the pipeline. The system would be comprised of a fiber optics telecommunications cable and related facilities buried adjacent to the pipeline within the designated ROW. The system would provide the various communications channels required for transmission of supervisory control and surveillance data and voice communications. The control system would also be tied into the fire prevention and protection system. A summary of proposed sensors, alarms, emergency response, control and training is summarized in Appendix I.

Pumping stations would be equipped with protective devices to monitor the operation of the entire station and individual pumping and heating units to ensure safe operation and protect the equipment from damage. The station controls would be designed for unattended fail-safe operation. Even though remote control of a station may be lost (e.g., because of a communications failure), the station would continue to run so long as its operation is consistent with all of its preset limits for pressure, temperature, flow, etc. Estimated energy requirements for pump station operation are shown in Section 2.13.

Maintenance centers would be located near Bakersfield, California; Casa Grande, Arizona; Lordsburg, New Mexico; and Midland, Texas to minimize travel distances and response times to make emergency repairs. These centers would be leased, existing warehouse-type buildings. Each maintenance center would be staffed and equipped to perform complete overhauls of heating and pumping units; valve repairs; and metering repairs along with the testing, calibration, and repair of all instrumentation, supervisory control, and communications equipment. The main control center would be staffed with technicians having special skills required in the maintenance of the more sophisticated equipment.

Maintenance activities associated with the pipeline and the ROW would include the following:

- Observation for any construction activities by others on or near the ROW.
- Inspection and maintenance of cathodic protection systems.
- Inspection of block values every six months to ensure proper operation and prevent encroachment of woody vegetation.
- Inspection and maintenance of pipeline mile-post and road-crossing markers.
- Inspection of crossings by other pipelines, highways, and utilities.

Aerial reconnaissance of the entire pipeline ROW would be conducted at least every two weeks (per DOT regulations) to detect small leaks which might not show up on the pipeline monitoring equipment and to monitor the success of erosion control and revegetation. The pilot making the reconnaissance would immediately report any observed activity or abnormal condition to the nearest maintenance center. The purpose of all monitoring activities would be to quickly identify problem areas so that correct mitigative measures may be employed to correct any problems.

Access roads to the pump stations would be maintained in such a way as to provide access for maintenance personnel at all times. The permanent 50-ft ROW would be the major access to the pipeline. Pipeline block valves would be fenced with pipe fences with locked gates. The valves would also be independently locked to prevent unauthorized operation. Block valve sites would be kept clear of woody vegetation. If road access to pump stations or block valves is prevented due to extremely wet or other road conditions as specified by the land managing agency, routine and emergency access would be provided by helicopter.

An oil spill contingency plan would provide for operational districts that would be associated with the designated maintenance centers along the pipeline route. The plan would provide information on oil spill response techniques and procedures to be followed. This plan must be approved by the Environmental Protection Agency and authorities of the respective states prior to the startup of the system. Appendix H summarizes the format and content for the required oil spill contingency plan.

2.2.4.2 Getty. Operation of the Getty pipeline would be in compliance with all applicable DOT, state, and local regulations and standards. The pipeline would be controlled remotely from a computerized operations center at the Getty Gaviota facility and would be manned by dispatchers around the clock. Dispatchers would have the ability to initiate and terminate flow into the pipeline from each of the Gaviota tanks, start and stop pumps, control line pressures and temperatures, and operate valves. A computer would interrogate the pump stations every few minutes and print out operating data from each. Equipment failure and operation alarms would be transmitted instantly, allowing the dispatcher to make necessary operational changes. The computer would compare incoming and outgoing meter readings and alarm significant deviations. If a deviation did not have an operational cause, the dispatcher would shut the pipeline down, close block valves, and notify the area foreman who would have the pipeline patrolled in search of a possible leak.

The Supervisory Control and Data Acquisition (SCADA) system proposed for this pipeline would provide detailed alarm, status, and control functions. Pipeline communications would be provided by a telecommunications cable buried adjacent to the pipeline within the ROW or by a microwave system located at the pump stations, depending on final design. The master station would originate remote control commands and receive status and alarm data from the remote terminal units (RTUs). The RTUs would receive and execute valid commands from the master station and transmit alarm and status information to the master station. The control system would also be tied into the fire prevention and protection system. A summary of proposed sensors, alarms, emergency response, control and training is summarized in Appendix I. The volume balance leak detection method proposed for this system employs operational pipeline measurement devices integrated into the SCADA system. Standby generator power would be provided for the RTUs to insure operation when commercial power fails. Redundant computers and peripheral equipment would be provided at the master station to increase reliability and allow for maintenance and repair without disruption of normal pipeline supervision and control. The computer would be configured to perform parallel operations and programmed to continuously scan for alarms.

A very small leak (less than three barrels per hour) could take several days to a week to be detected by the SCADA system resulting in a loss of 70 to 500 barrels of oil. Visual inspection would be relied upon to locate small leaks more quickly. In the case of a large leak which would be detected by SCADA, assuming "worst-case" (complete rupture and 400,000 BPD throughput), it would be possible to spill up to

3,160 barrels of oil at a sensitive location (see Section 4.2.15 for additional detail). This would vary with the terrain and location of the check and block valves relative to the leak point. For this calculation it was assumed that it would take five minutes to detect the leak and four minutes to close the block valves.

All major pump station equipment would be monitored by on-site sensors for parameters such as temperature, pressure, and vibration. If a mechanical or electrical fault occurred, the defective equipment would be automatically stopped and an alarm sent to the dispatcher. The dispatcher could not restart the defective equipment until repairs were made and a lockout mechanism locally reset. Pump stations would be designed for 24-hour/day operation and would be visually inspected daily for appropriate equipment lubrication, signs of potential malfunctions, or any abnormal appearance or sound. Estimated energy requirements for pump station operation are shown in Section 2.13.

Three pump station operators would be required. One operator would be assigned full time to the Gaviota pump station; one operator would be assigned to inspect each of the other pump stations daily; the third operator would relieve the other operators two days each week. A maximum of two to three trips per day would be generated by pipeline operations. Additionally, two pipeline gauge inspectors would be required, one at Gaviota and one at the outgoing meter station.

Maintenance facilities would be located at Getty's marine terminal at Gaviota and would be staffed and equipped to perform complete overhauls of heating and pumping units; valve repairs; metering repairs and testing, calibration, and repair of all instrumentation, supervisory control, and communications equipment. Maintenance activities associated with the pipeline and the ROW would include the following:

- Observation for any construction activities by others on or near the ROW.
- Inspection and maintenance of cathodic protection systems.
- Inspection of block valves every six months to ensure proper operation and prevent encroachment of woody vegetation.
- Inspection and maintenance of pipeline mile-post and road-crossing markers.
- Inspection of crossings by other pipelines, highways, and utilities.

The pipelines would be overflown by a skilled pipeline patrol pilot twice weekly. (DOT regulations require overflights every two weeks.) At least once each year, pipe-to-soil potential readings would be made and analyzed to determine the effectiveness of the cathodic protection system.

Access roads to the pump stations would be maintained in such a way as to provide access for maintenance personnel at all times. The permanent 20-ft ROW would be the major access to the pipeline. Pipeline block valves would be fenced with chain link fences with locked gates. The valves would also be independently locked to prevent unauthorized operation. Block valve sites would be kept clear of woody vegetation. If road access to pump stations or block valves was prevented due to extremely wet or other road conditions as specified by the land managing agency, routine and emergency access would be provided by helicopter.

An oil spill contingency plan would be developed for Getty's proposed pipeline system. This plan would provide detailed information on oil spill response techniques and procedures to be followed. This plan must be approved by the Environmental Protection Agency, State of California, and other authorities prior to the startup of the pipeline system. Appendix H summarizes the format and contents for the required oil spill contingency plan.

2.2.5 Abandonment

The project life of the pipeline systems would depend on the availability of crude oil. Should additional supplies become available, the life of the facilities and/or their capacities could be extended beyond the projected 30-year life of the project. Insufficient availability of crude oil or other economic situations could make operation of the pipeline system infeasible beyond the 30-year project life and could result in the abandonment and disposal of all or portions of the system. The abandonment procedures used would be subject to appropriate existing local, state, and Federal regulations.

Crude oil remaining in the system would be drained to the tank farms. Removal of the crude oil from the pipeline would be accomplished by displacing it with water obtained from existing sources along the route. Water would be delivered to oil-water separators before discharge. Equipment would be disconnected, sealed, secured, and possibly removed for salvage. Storage tanks at the tank farms would be dismantled and salvaged.

If warranted by salvage value, pipe would be removed, otherwise it would be abandoned in place. Removing and salvaging the pipe and block valves would be similar to construction activities but with a simplified work scope. Some sections of pipeline, such as river or road crossings, would not be removed. The ends of the pipeline on both sides of such a crossing would be sealed, covered with soil, and the ROW restored. If it were economically infeasible to salvage the pipeline, it could be purged of petroleum and filled with an inert substance such as nitrogen gas or water and left buried. The pipeline cathodic protection system would be disconnected and removed.

Mainline pumps and motors would be disconnected and either stored or removed for other uses. Before the pump stations were abandoned, all oil would be evacuated and equipment would be salvaged or disposed of. Any support facilities used in the abandonment procedures would be taken out of service, sold, or salvaged. These facilities include maintenance, communication, fire protection, oil cleanup, and electrical support equipment. Unsalvageable material such as concrete would be disposed of at authorized sites. All disturbed areas would be regraded and revegetated where practical. Additional backfill might be required to restore the ROW to its original condition. The abandoned ROW would revert to the private landowner's or agency control. Land management agencies could place special conditions on abandonment if deemed necessary.

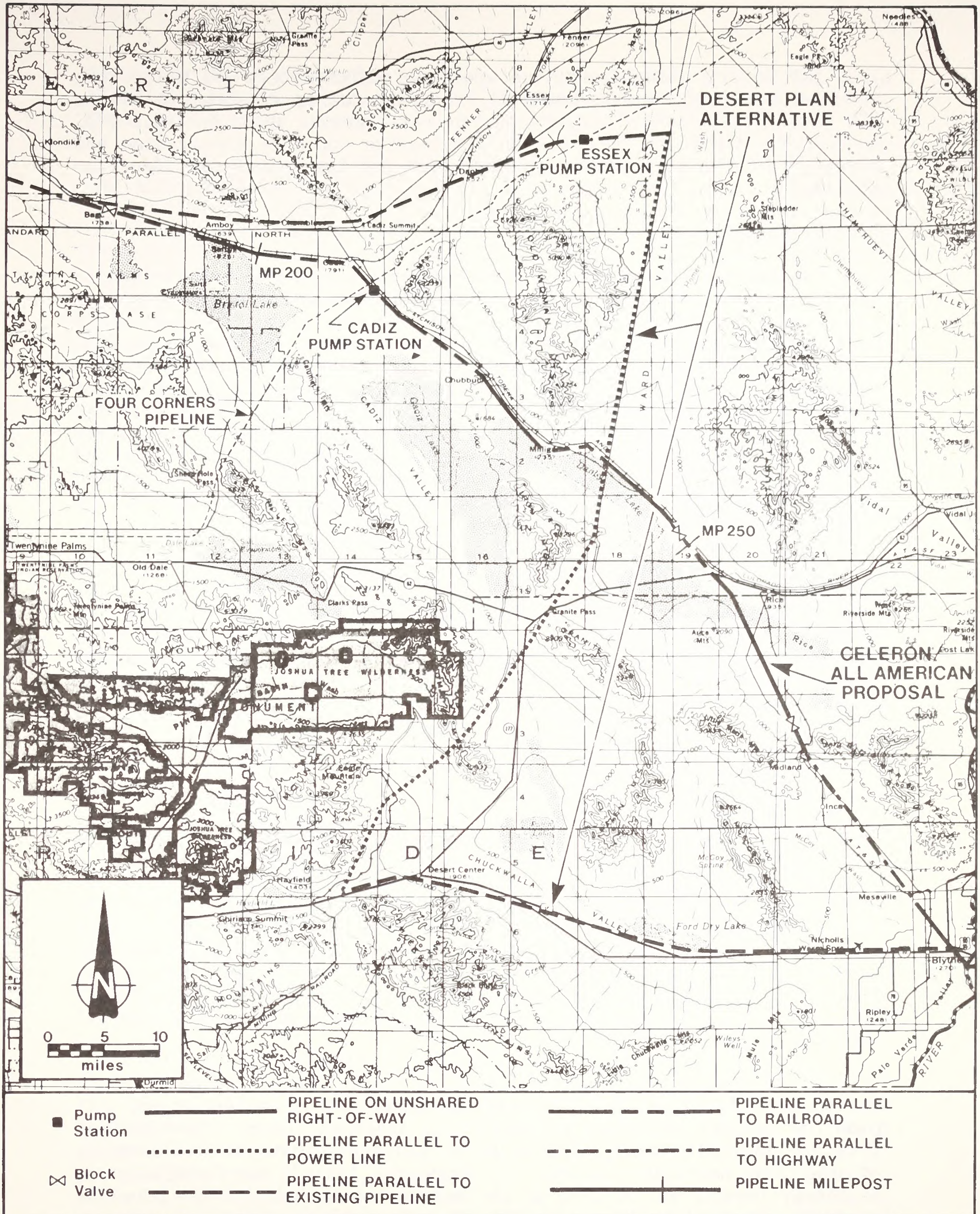
2.3 Santa Maria Canyon Alternative

The Santa Maria Canyon Alternative was selected as a possible way to avoid potential conflicts with recreation, visual resources, wilderness values, and existing land use (including residential development in Tepusquet Canyon). The Santa Maria Canyon Alternative would diverge from Getty's proposed route approximately 1 mile south of Foxen Canyon Road (near the Sisquoc River) in western Santa Barbara County (see Map 1-2, sheet 2). It would pass through Celeron's proposed Sisquoc pump station site and head west toward Tepusquet Canyon. The alternative route would then cross Tepusquet Creek near the mouth of the Canyon, turn north up the east side of Santa Maria Canyon, cross the Sierra Madre Mountains, and turn east and parallel the Cuyama River and California State Highway 166 to Cuyama Valley where it would rejoin Getty's and Celeron's proposed routes.

This alternative would be approximately 38.5 miles in length and would disturb approximately 467 acres of land during construction. The ROW would cross a combination of Federal, state, and private land as is shown in Table 2-3. A pipeline along the Santa Maria Canyon Alternative would be constructed and operated in the same manner as described for the Getty and Celeron/All American proposals.

2.4 Desert Plan Utility Corridor Alternative

The Desert Plan Utility Corridor Alternative is based on information contained in BLM's California Desert Conservation Area Plan (BLM 1980). Designated utility corridors contained in the Desert Plan (H, E, and K) have been identified by BLM as an alternative route for the All American Pipeline between Amboy and Blythe in central San Bernardino and eastern Riverside Counties (see Map 2-1). This alternative parallels existing pipelines and electric transmission lines through Fenner Valley (west to east), Ward Valley (north to south), and Chuckwalla Valley (west to east). The Desert Plan Alternative would diverge from All American's proposed route west of Amboy, proceed east past Fenner, turn south and continue to a point west of Desert Center, and finally turn east and parallel Interstate 10 to Blythe where it would rejoin the proposed route. The Cadiz tank farm and pump station site would be located where the BLM proposed utility corridor crosses the existing Four Corners Pipeline as shown on Map 2-1. For descriptive purposes, this site is being called the Essex pump station.



MAP 2-1 DESERT PLAN ALTERNATIVE

The Desert Plan Alternative would be approximately 191 miles long and would disturb approximately 2,315 acres during construction. The ROW would cross Federal, state, and private land as shown on Table 2-3. A pipeline along the Desert Plan Alternative would be constructed and operated in the same manner as described for the Celeron/All American proposal.

2.5 Brenda Alternative

The Brenda Alternative was first presented in the Palo Verde-Devers 500 kV Transmission Line Draft EIS (BLM 1978), and a modification of this route has been identified by BLM and FWS as an alternative to crossing the Kofa National Wildlife Refuge (NWR) and BLM wilderness study areas. The Brenda Alternative route would be located in La Paz County in western Arizona and would pass around the north end of the Kofa NWR. This alternative would diverge from All American's proposed route at the La Paz pump station, parallel the southside of Interstate 10 to a point about 4.5 miles east of Quartzsite, cross I-10 and parallel the north side of I-10 to Brenda, recross the highway and rejoin the proposed route approximately 6 miles west of the Maricopa County line (see Map 1-2, sheet 6).

The Brenda Alternative would be approximately 63 miles long and would disturb approximately 764 acres of land during construction. The ROW would cross Federal, state, and private land as detailed on Table 2-3. A pipeline along the Brenda Alternative would be constructed and operated in the same manner as described for the Celeron/All American proposal. No pumping or heating stations would be required along this alternative.

2.6 McCamey to Freeport Alternative

Since Celeron/All American's original applications were submitted in September of 1983, estimates of heavy OCS crude oil volumes to be shipped from the West Coast have risen from the 400-500,000 BPD range to 600-800,000 BPD range. In addition, major investments in the range of several billion dollars have been and are being made in west Texas to bring CO_2 to the area for the purpose of injection into the oil fields to stimulate additional recovery. The initial projects have proven successful to the extent that the large excess pipeline capacity presently available will likely be reduced over the next few years. Thus, there may not be sufficient excess pipeline capacity out of west Texas to handle the total volumes that would be shipped through the All American system.

As an alternative means of shipping crude oil to the Gulf Coast, Celeron/All American has proposed to construct a heated, crude oil pipeline system, 460 miles in length, to transport crude oil from west Texas to the Gulf Coast. The pipeline would originate at the terminus of the All American pipeline at McCamey, Texas, and terminate at Freeport, Texas (see Map 2-2, at the end of the document). The pipeline would be designed to transport 300,000 BPD of high sulfur, heavy crude oil to an existing terminal at Freeport, Texas, where it would be shipped by existing pipeline to local area refineries and by barge or tanker to other destinations along the Gulf Coast. This system would allow the oil to reach additional refineries, not served by the Wink, Crane, and McCamey connections.

The pipeline would proceed south and southeast from McCamey, Texas, for approximately 40 miles until it intersects the Houston Natural Gas Company's Oasis pipeline north of Sheffield, Texas. From this point the Celeron pipeline would parallel the Oasis pipeline for approximately 295 miles. From the point where the Celeron line leaves the Oasis pipeline, it would follow existing roads and other ROW for approximately 125 miles until it reaches its destination at Freeport, Texas.

The pipeline system would be of the same design as described for the Celeron/All American proposal and would require five pumping and heating stations spaced approximately 90 to 95 miles apart, with the first one located at McCamey. The pipeline would be constructed as described for the Celeron/All American proposal with modifications made for local conditions. For example, in eastern Texas where the pipeline would cross soils with high shrink/swell characteristics, it would be buried 6 ft deep (compared to 4 ft deep in other areas) to prevent the pipeline from being worked to the surface.

2.7 Single Pipeline Alternative

Another alternative identified by the JRP would be the approval of only a single pipeline between Las Flores and Emidio, either the Celeron or the Getty proposal. Either of these pipelines could potentially tie into the All American pipeline if it is constructed. For the purposes of worst-case analysis, it was assumed that the approved pipeline would have a capacity of 400,000 BPD and would be constructed along one of the routes presented in the previous alternatives. Construction and operation parameters would be the same as described for the Getty and Celeron proposals.

2.8 No Project (No Action) Alternative

The No Project (No Action) Alternative would entail the denial of the permits or approvals necessary for the construction or operation of the Getty and Celeron/All American pipelines. If the Celeron/All American and Getty proposals and routing alternatives were denied, oil could be shipped from Santa Barbara County by truck, rail, or marine tanker. The impacts from these alternative transportation modes are addressed in Chapter 4 of this EIR/EIS.

2.9 Alternatives Considered But Eliminated from Detailed Analysis

In addition to the alternatives described previously, additional alternatives were initially considered. After a review of these alternatives, it was found that they were not compatible with the goals and objectives of the applicants, had unacceptable environmental impacts, were remote or speculative in nature, or would require an inordinate amount of resources to analyze in detail. Under CEQA and NEPA, alternatives with these types of constraints can be eliminated from detailed analysis. The alternatives that were considered but eliminated from detailed analysis in this EIR/EIS and the reasons for their elimination are presented below.

2.9.1 Pipeline to San Francisco Refining Area

This alternative was not subjected to detailed analysis because the alternative is inconsistent with the Celeron/All American proposal and is one of the possible destinations for crude oil under the Getty proposal. At this time there is also insufficient demand at San Francisco area refineries for the projected OCS crude oil, and the alternative would not resolve the West Coast crude oil surplus.

Two pipelines currently go to San Francisco; one is Union Oil's line from the Santa Maria area and the second is Getty's line from Bakersfield. Numerous studies have indicated that the maximum expected quantity of OCS crude that could be accommodated in San Francisco Bay area refineries would be 35,000 to 50,000 BPD (ADL 1984). This alternative would redistribute the crude oil surplus from the Gaviota coast area to San Francisco. Because of the San Francisco's limited refining capacity, new refineries would be required, or the excess crude would have to be moved by tanker from the Santa Barbara Channel to the East Coast.

2.9.2 Pipeline to Los Angeles Refining Area

This alternative was not subjected to detailed analysis because it would only partially resolve the West Coast crude oil surplus, and is one of the possible destinations for crude oil under the Getty proposal. Additionally, the alternative would increase air emissions in the South Coast Air Basin nonattainment area, would provide much less flexibility for the transportation of crude oil within and out of California, and would require inordinate amounts of analysis to consider in detail.

ARCO's pipeline subsidiary, Four Corners Pipeline Company, and Chevron are in the process of preparing permit application documentation for a 200,000 to 300,000 BPD pipeline from the Gaviota coast to Los Angeles (Williams 1983, Solten 1983). These two companies have their own refineries in the Los Angeles area.

The maximum estimated quantity of additional OCS crude oil that could be refined in the Los Angeles area refineries is estimated to be 200,000 to 230,000 BPD. Any OCS crude that is used in the Los Angeles refineries would displace Alaskan North Slope crude oil currently being refined and therefore would not eliminate the West Coast surplus. This alternative would simply redistribute the oil from the Gaviota coast area to Los Angeles. An additional crude oil pipeline (such as the PACTEX pipeline discussed below) or tankers would be required to move the crude oil from Los Angeles to the east. Tankers represent greater oil spill risks than pipelines.

This alternative does not provide for the possibility of transporting heavy San Joaquin Valley crude oil to west Texas. The OCS and Alaskan North Slope crudes are not the only crudes that are in surplus on the West Coast. Crude oil production has increased significantly in the San Joaquin Valley due to Enhanced Oil Recovery projects. Some producers are using trucks and trains to move the crude oil to market. The Celeron/All American pipeline proposal provides the flexibility of transporting the San Joaquin Valley crudes to West Texas.

2.9.3 Pipeline from Gaviota Coast to Los Angeles Refining Area to West Texas

This alternative was not analyzed in depth because it would have significant air quality impacts in the South Coast Air Basin, would require an inordiante amount of analysis, and does not provide the flexibility for shipping crude oil from the San Joaquin Valley to west Texas that Celeron/All American's current proposal provides.

This alternative would consist of a coastal pipeline to Los Angeles from the Gaviota coast plus a marine terminal in the Los Angeles/Long Beach harbor area and an interconnecting pipeline to west Texas. The reason for running a pipeline through the Los Angeles/Long Beach harbor area would be to allow Alaskan North Slope crude to be off-loaded from tankers into the pipeline.

The Pacific Texas Pipeline Company is in the process of completing permit application documentation for the marine terminal and an unheated pipeline from the Long Beach harbor area to west Texas (Doyle 1984). To dispose of a projected 500,000 to 600,000 BPD of crude with this alternative, the proposed ARCO-Chevron pipeline from the Gaviota coast to Los Angeles would have to be expanded from a currently planned capacity of 200,000 to 300,000 BPD to 500,000 to 600,000 BPD.

2.9.4 Truck Transportation Mode

This alternative was not considered in depth because truck transportation is uneconomical and not feasible due to the large volumes of crude oil involved. The oil industry has found that moving large volumes of crude oil from one geographic area to another by truck is not practical. The Oil Transportation Study found this to be only a short-term, low volume solution to oil transport (ADL 1984).

2.9.5 Rail Transportation Mode

This alternative was not subjected to detailed analysis because it is uneconomical and not feasible due to the large volumes of crude involved. The oil industry has found that moving large volumes of crude by rail is not practical. The additional cost of rail transportation would be at least $1 per barrel more than a pipeline from the Gaviota coast to Houston (not including the investment for loading and unloading facilities that would be required) (ADL 1984).

2.9.6 Marine Transportation Mode

This alternative was not analyzed in depth because it is inconsistent with All American's goals and objectives and is a part of Getty's overall proposal. Further, the alternative is also against current Santa Barbara County policy to minimize the transportation of oil by tanker. The risk to marine resources from potential oil spills is greater than the County wishes to accept (ADL 1984). Resources at risk such as shell fisheries, bird life, and recreation are more vulnerable to oil spills from tanker transport than to spills from terrestrial pipelines. The ability to control and contain oil on land reduces environmental vulnerability relative to tanker spills in open water.

The alternative would consist of an expanded marine terminal(s) along the Gaviota coast and the use of existing and new tankers to move the oil to market. The availability of tankers for this alternative is uncertain since the size of the West Coast crude oil surplus is uncertain. If crude production occurs on the high side of current estimates, then new tankers would likely be needed. Conversely, if the current production estimates are not achieved, then no new tankers would be required. The EIR/EIS team found that tanker costs vary from about $4/barrel for no new tankers to over $8/barrel if new tankers are required. Pipeline costs vary from about $3/barrel to $7/barrel. Coupled with operating costs the pipeline would be a cost-competitive transportation mode.

2.9.7 Tepusquet Canyon Alternative

Alternative routes through the Tepusquet Canyon area were initially identified by both applicants as an alternative means of crossing the LPNF in north-central Santa Barbara County. This alternative would diverge from Getty's proposed route approximately 1 mile south of Foxen Canyon Road (near the Sisquoc River). It would follow the same route as the Santa Maria Canyon Alternative past Celeron's proposed Sisquoc pump station to the mouth of Tepusquet Canyon. There it would turn north, roughly parallel to Tepusquet Canyon Road, and pass over the drainage divide into Buckhorn Canyon. This route would continue north to Highway 166 and follow the same route as the Santa Maria Canyon Alternative.

During a series of public meetings, strong concerns were expressed by local residents regarding local resources such as riparian vegetation, oaks, and sensitive water supplies. Due to difficulty of construction in the upper reaches of Tepusquet Canyon and the relatively large number of ROW leases necessary (caused by the large number of relatively small land holdings), both applicants reassessed the Tepusquet Canyon Alternative. A refinement of this route (the Santa Maria Canyon Alternative) that avoids the numerous small land holdings in Tepusquet Canyon area and avoids areas of strong public concern for potential environmental impact has been developed by Celeron.

2.9.8 Tunnel Canyon Alternative

The Tunnel Canyon Alternative was considered as alternative means of crossing the LPNF in central Santa Barbara County. This alternative would diverge from the applicants' proposed route north of Buellton, cross the Sierra Madre Mountains via Tunnel Canyon (approximately 6 miles east of the applicants' proposed route in La Brea Canyon), and enter the Cuyama Valley where it would rejoin the applicants' proposed route. This alternative was eliminated from detailed analysis because of its potential effects on wilderness values. The route traverses a 61,000-acre Further Planning Area (FPA) in the LPNF that has a high primitive classification and suitability for wilderness. Construction of a pipeline and associated new access roads would create severe impacts on wilderness potential.

2.9.9 Delay of Projects

A final alternative that was investigated would be to delay the implementation of either or both of the proposed projects. Such an alternative is usually considered to reduce socioeconomic impacts by phasing project construction with other ongoing or planned activities in the project area. The Celeron/All American and Getty construction work forces would be relatively small and fast moving. Thus, they would not be expected to cause significant socioeconomic impacts in the areas traversed by the proposed pipelines, and a delay of the project was not seen as having a substantial beneficial effects.

In addition, a delay of the project would have several adverse effects. First of all, a delay of pipeline construction would lengthen the period of time that a crude oil surplus exists on the West Coast. In the absence of a pipeline, other less efficient modes of transporting crude oil such as marine tankers, rail tank cars, and trucks would have to be utilized. Secondly, a delay of the project could significantly increase the costs of pipeline construction. Lastly, a delay of construction would cause a temporary delay of tax revenues to governments in the counties crossed by the pipeline. For all of the above reasons, this alternative was eliminated from detailed analysis.

2.10 Interrelationships with Other Planned or Proposed Projects

Projects potentially interrelated with the Celeron/All American and Getty proposals were evaluated to determine if their impacts would interact in a cumulative manner. Projects considered are currently proposed or have a reasonable likelihood of going forward, and would use or compete for the same resources. The Santa Barbara County Energy Division identified eight coastal oil and gas development projects that could have cumulative impacts for evaluation. These as well as other non-energy related projects are presented in Table 2-7.

The oil related projects on Table 2-7 are currently being permitted through the CEQA process with Santa Barbara County and the State of California as lead agencies on all projects. Federal involvement is primarily through the Minerals Management Service (MMS) which is the lead Federal agency on projects beyond the 3-mile limit. Of the projects on Table 2-7, MMS is participating in the Union, Exxon, and Chevron offshore development projects. The BLM and Forest Service are not involved in these projects. On the Celeron/All American and Getty Pipelines EIR/EIS, the BLM is the lead Federal agency for Celeron/All American and the Forest Service is the lead Federal agency for Getty: MMS is not involved in this EIR/EIS. The county, state, and Federal

TABLE 2-7

PROJECTS POTENTIALLY INTERRELATED TO CELERON/ALL AMERICAN AND GETTY PIPELINES

Project	Description/Location	Interrelationship
Major Oil Development Projects		
Exxon Santa Ynez Unit/Las Flores Canyon Project (Draft EIR April 1984)	Offshore development includes 3 to 4 new platforms and modifications to existing platform and OS&T. Onshore development includes modification of existing gas treatment facility. Santa Ynez Unit lies from 3 to 8 miles offshore of the Gaviota Coast. The gas treatment facility is in Las Flores Canyon.	Would be the starting point for the Celeron/All American Pipeline; would supply crude oil to this and possibly other pipelines. Potential interrelationships in areas of employment, housing, transportation, income to workers, and tax benefits to government.
Chevron-Texaco Pt. Arguello/Gaviota Project (Draft EIR July 1984)	Two offshore platforms connected by pipeline to an onshore oil and gas processing facility. Platforms located 10 miles west of Pt. Conception. Pipeline landfall at Pt. Conception. Processing facility located at Gaviota.	Same as above.
Union OCS P-0441 Development (Draft EIR March 1985)	Offshore platform with a pipeline to onshore processing facility; pipeline from the processing facility to an existing pipeline in Orcutt which is connected to Union's Santa Maria Refinery. Platform located 5 miles WNW of Point Arguello. Pipeline landfall at Surf then moving east to processing facility 5 miles north of Lompoc. Pipeline running north to Orcutt.	Potential interrelationship in areas of employment, housing, transportation, income to workers, and tax benefits to government.
ARCO Coal Oil Point Project (Draft EIR January 1985)	Multi-component project involving 2 offshore platforms, modification of an existing oil treatment facility, new gas treatment facility, pipeline from platforms to processing facilities and marine terminal, and crude oil storage. Platforms located 2 miles south of Coal Oil Point, gas processing facility in Eagle Canyon, oil treatment facility in Ellwood, and crude oil storage at Dos Pueblos.	Possible supplier of some crude oil to pipelines. Potential interrelationship in areas of employment, housing, transportation, income to workers, and tax benefits to government.
Marine Terminals		
Getty Gaviota Consolidated Coastal Facility (Draft EIR July 1984)	Marine terminal, crew, and supply base, and onshore storage for crude oil development Gaviota	Would be the starting point for the Getty Pipeline; would provide some oil to this and possibly other pipelines and serve as a terminal for loading tankers. Potentially competing with pipeline transport.

TABLE 2-7 (CONTINUED)

Project	Description/Location	Interrelationship
Las Flores Terminal Group (Application submitted, further environmental review pending)	Marine Terminal. Mouth Las Flores Canyon.	Would serve as a terminal for loading tankers with oil for transport. Potentially competing.
<u>Oil Transportation Projects</u>		
Four Corners Pipeline Project (Draft EIR January 1985)	A common carrier pipeline for transportation of heated crude oil from an ARCO oil treating facility to marine terminal (Gaviota or LFT). Multiple segment alternatives, all located between Gaviota and Ellwood.	Potential interrelationship in areas of employment, housing, transportation, income to workers, and tax benefits to government.
Southern California Pipeline Systems Pipeline Project (Application expected November 1984)	Crude oil pipeline for transport of offshore oil production from the Santa Barbara Channel and Santa Maria Basin. Ellwood and/or Las Flores Canyon to Wilmington-Carson area refineries in Los Angeles County.	Would compete for some of the crude oil. Potential interrelationship in areas of employment, housing, transportation, income to woerkes, and tax benefits to government.
<u>Non Oil Related Projects</u>		
Cross-Town Freeway Project (Final EIR June 1984)	2.5 miles of U.S. 101 in downtown Santa Barbara would be converted into a four-lane divided freeway with underpasses for State and Garden streets. Santa Barbara.	Potential interrelationship in areas of employment, housing, transportation, income to workers, and tax benefits to government.
Hyatt Resort and Hotel (Draft EIR August 1984)	92-acre development consisting of a hotel, conference center complex, and tennis club. Ellwood.	Same as above.
Raytheon Industrial Project (Final EIR June 1984)	67-acre development consisting of manufacturing, warehousing, and office space. Goleta.	Same as above.
University Village (Final EIR June 1984)	245-acre residential development encompassing existing open space, golf courses, oil facilities, and public beaches. Goleta.	Same as above.

TABLE 2-7 (CONTINUED)

Project	Description/Location	Interrelationship
Los Carneros Community (Final EIR June 1984)	49-acre mixed use development including an industrial research park, commercial, and residential uses. Goleta.	Same as above.
Santa Barbara Business Park (Final EIR August 1983)	13-acre development of light manufacturing ware-housing and office space. Goleta.	Same as above.
Hollister Business Park (Final EIR August 1983)	25-acre development for industrial floor space leasing. Ellwood.	Same as above.
Santa Barbara Airport Expansion (Final EIR June 1984)	Expansion of the existing ariport facilities to accommodate 750,000 passengers annually by 1990 with multiple improvements. Goleta.	Same as above.
	<u>PROJECTS CONSIDERED BUT ELIMINATED FROM CUMULATIVE ANALYSIS</u> (Reason for elimination from detailed analysis in parenthesis)	
Platform Gail and Carpinteria Gas Plant (Out of area of influence)	Offshore platform connected by pipeline to an existing onshore gas processing facility which will be modified. Platform Gail is 13.5 miles west-southwest of Oxnard. The gas plant is located within the city limits of Carpinteria.	NA
Crew Base in San Luis Obispo County (Out of area of influence)	Crew base facility which supports offshore oil exploration. San Luis Bay - Morro Bay.	NA
Shift of VTSS Marine Traffic Lanes (Out of area of influence)	Moving traffic lane further south to accommodate Chevron's Platform Gail. General area 10 to 15 miles southwest of Oxnard.	NA
Santa Barbara Shores (In early stage of planning)	No plans submitted to County. Ellwood.	NA

TABLE 2-7 (CONTINUED)

Project	Description/Location	Interrelationship
Gaviota State Park and Refugio State Beach Renovations (Planning stage only-no funds available)	General upgrading of existing facilities and improved parking and access at Refugio, and water treatment plant at Gaviota. 0.9 mile west of Gaviota and 8.2 miles east of Gaviota, respectively	NA
Vandenburg Air Force Base Space Shuttle Expansion (Construction to be completed by April 1985)	Expansion to provide launch and recovery of "Discovery" series of Space Shuttle Program West to Lompoc	NA
Bixby Ranch Cluster Development (In very conceptual stages of planning)	No plans submitted to County. Point Conception	NA

Source: ERT

NA - Not Applicable

agencies will act upon the permit applications for the various proposed offshore development facilities, oil and gas processing facilities, oil and gas collection systems, and oil and gas transport systems. The Celeron/All American and Getty pipeline systems are two of the primary transportation modes being considered for existing and future crude oil production in the Santa Barbara Channel and Santa Maria Basin.

Other projects considered as interrelated projects are the Pacific Texas Pipeline from Long Beach, California to Texas, and Southern California Edison's expansion of the Palo Verde-Devers transmission line system in southern California and Arizona. These projects do not have detailed project descriptions; however, for the Kofa NWR, there could be interrelated impacts created by multiple corridors and resulting surface disturbance. These impacts are generally discussed under cumulative impacts, Section 4.9.

2.11 Significant Impact Summary

Table 2-8 summarizes the significant impacts for the entire Celeron/All American and Getty pipelines using the same descriptors contained in Table 2-9. The reader is reminded that 2-8 summarizes impacts for the complete pipeline routes, while Table 2-9 summarizes impacts for only those portions of the Celeron/All American and Getty proposals that would be replaced by a routing alternative. Additional details on impacts and significance criteria for specific disciplines can be found in the Summary at the beginning of this document and in Chapter 4 - Environmental Consequences.

The reader is reminded that the impacts presented in Tables 2-8 and 2-9 are mitigated with respect to the application of the measures described at the end of Chapter 4. For the disciplines of air quality, transportation, and system safety, no significant impacts would occur; therefore, these disciplines are not included in the table. In the event of an oil spill, significant impacts are also expected to surface water, groundwater, aquatic biology, terrestrial biology, and land use and recreation. These impacts would depend on the size and location of the spill, so only general spill sensitivity is included in Tables 2-8 and 2-9.

2.12 Comparison of Environmental Impacts

A comparison of the significant environmental impacts resulting from the Celeron/All American and Getty proposals and the three routing alternatives is presented in Table 2-9. Differences between the Celeron/All American and Getty proposals are highlighted; where only a single number is presented, impacts resulting from the two proposals would be the same. The impacts for both pipelines are also presented where appropriate. The comparative analysis was prepared using information contained in Chapter 4 of this draft EIR/EIS. Table 2-10 summarizes impacts and hazards for the McCamey to Freeport Alternative. Information was not available for certain descriptors due to the preliminary nature of the location of the ROW and the pump stations.

TABLE 2-8

SUMMARY OF SIGNIFICANT IMPACTS[1] AND HAZARDS FOR THE CELERON/ALL AMERICAN AND GETTY PIPELINES

Code[2]	Getty	Celeron	All American
<u>General</u>			
C Linear miles (acres) of land	113(770)	121.5(1,473)	1,084(13,139)
<u>Geology</u>			
H Number of Quaternary faults crossed	8	9	8
H Number of unstable slope areas crossed	15	15	13
<u>Soils</u>			
C Miles (acres) of sensitive soils crossed[3]	72(873)	78(946)	253(3,067)
<u>Surface Water</u>			
C Number of perennial stream crossings	4	7	7
H Number of streams with degrading channels crossed	4	4	3
H Number of streams with flood hazard crossed	4	4	3
C Number of streams with municipal water supply crossed	1[4]	1[4]	0
<u>Groundwater</u>			
Miles of sensitive groundwater basins crossed	32.5	28.5	40.7
<u>Aquatic Biology</u>			
S Number of perennial streams with important permanent fish species crossed	1	2	5
<u>Terrestrial Biology</u>			
S Miles (acres) of riparian vegetation disturbed	5.5(33)	5.1(31)	3.5(21)

TABLE 2-8 (CONTINUED)

Code[2]	Getty	Celeron	All American
Terrestrial Biology (Continued)			
S Miles (acres) of oak woodland disturbed	14.5(88)	11.4(138)	10.4(126)
C Miles (acres) of dunes disturbed	0	0	2(24)
S Number of federally protected species affected	3	3	1
S Number of state-protected species affected	4	4	5
S Desert tortoise crucial habitat crossed	No	No	Yes
S Desert bighorn critical habitat crossed	No	No	Yes
Socioeconomics			
C Maximum Percent increase in county tax base (county)	(Santa Barbara) 0.53	(Santa Barbara) 0.53	(Hudsepth) 13.5
Land Use And Recreation			
S Miles (acres) of FPA or WSA crossed	3.2(39)	8.2(99)	0
C Miles (acres) of irrigated cropland crossed	21.2(257)	20.7(251)	81.8(993)
C Miles (acres) of National Wildlife Refuge crossed	0	0	25(303)
S Number of National Forest campgrounds affected	3	2	0
Cultural Resources			
C Number of known sites within the ROW[5]	16	13	54
S Number of sites within the ROW considered eligible for the National Register[6]	4	4	4

TABLE 2-8 (CONTINUED)

Code[2]	Getty	Celeron	All American
Visual Resources			
S Acres of significant visual change in LPNF	92.14	92.17	0
S Significant visual change at pump stations	0	0	2
Noise			
S High noise levels (60 dBA) near residences	Yes	Yes	Yes
Oil Spill Potential			
C Probability spill greater than 9.5 barrels for new pipeline (spills/yr for overall length)	0.08	0.08	0.758
C Probability spill greater than 9.5 barrels for 40-year old pipeline (spills/yr for overall length)	0.54	0.54	4.87
S ROW crosses areas sensitive to an oil spill	Yes	Yes	Yes

[1]Impact values include the implementation of the committed mitigation measures presented in Chapter 4.

[2]C = area of concern (as identified during scoping) with no significant impact
H = potential geologic or hydrologic hazard to the pipeline
S = significant impact from pipeline construction or operation (details can be found in Chapter 4)

[3]Mileage calculations are estimates based on soils maps of variable scales.

[4]Overhead crossing of the California Aqueduct.

[5]Differences in the number of known sites also reflect differences in the number and intensity of surveys that have been conducted and in the site recordation methods that were used. The Class III inventory is expected to identify additional sites.

[6]Insufficient information exists to assess the National Register eligibility of all known sites with the ROW. The cultural resources compliance plan will minimize significant impacts to sites determined to be eligible for the National Register.

TABLE 2-9

COMPARISON OF SIGNIFICANT IMPACTS[1] AND HAZARDS FOR THE CELERON/ALL AMERICAN AND GETTY PROPOSALS AND ALTERNATIVES

Code[2]	Celeron/ All American and Getty Proposals[3]	Santa Maria Canyon Alternative	Celeron/ All American Proposal[3]	Desert Plan Alternative	Celeron/ All American Proposal[3]	Brenda Alternative
General						
C Linear miles (acres) of land disturbed						
Celeron/All American	26(315)	38.5(467)	114(1,382)	191(2,315)	59(715)	63(764)
Getty	26(158)	38.5(233)	NA[4]	NA	NA	NA
Both pipelines[5]	52(473)	77(700)	NA	NA	NA	NA
Geology						
H Number of Quaternary faults crossed	2	2	0	0	0	0
Both pipelines	2	2	NA	NA	NA	NA
H Number of unstable slope areas crossed	5	7	0	1	0	0
Both pipelines	5	7	NA	NA	NA	NA
Soils						
C Miles (acres) of sensitive soils crossed						
Celeron/All American	19(230)	24(291)	114(1,382)	191(2,315)	16(194)	3(36)
Getty	19(115)	24(145)	NA	NA	NA	NA
Both pipelines	38(345)	48(436)	NA	NA	NA	NA
Surface Water						
C Number of perennial stream crossings						
Celeron/All American	2	3	0	0	0	0
Getty	2	3	NA	NA	NA	NA
Both pipelines	4	6	NA	NA	NA	NA
H Number of streams with degraded channels crossed	2	1	0	0	0	0
Both pipelines	2	1	NA	NA	NA	NA
H Number of streams with flood hazard crossed	2	2	0	0	0	0
Both pipelines	2	2	NA	NA	NA	NA
C Number of streams with municipal water supply crossed	0	0	0	0	0	0
Both pipelines	0	0	NA	NA	NA	NA
Groundwater						
C Miles of sensitive groundwater basins crossed	1.5	2	0	0	10	12
Both pipelines	3.0	4	NA	NA	NA	NA
Aquatic Biology						
C Number of perennial streams with important fish species crossed	1	1	0	0	0	0
Both pipelines	1	1	NA	NA	NA	NA

TABLE 2-9 (CONTINUED)

Code[2]	Celeron/ All American and Getty Proposals[3]	Santa Maria Canyon Alternative	Celeron/ All American Proposal[3]	Desert Plan Alternative	Celeron/ All American Proposal[3]	Brenda Alternative
Terrestrial Biology						
S Miles (acres) of riparian vegetation disturbed						
Celeron/All American	4(24)	1.6(10)	0	0	0	0
Getty	3.8(23)	1.6(10)	NA	NA	NA	NA
Both pipelines	7.8(47)	3.2(20)	NA	NA	NA	NA
S Miles (acres) of oak woodland disturbed						
Celeron/All American	6.0(73)	10.6(128)	0	0	0	0
Getty	8.1(49)	10.6(64)	NA	NA	NA	NA
Both pipelines	14.1(122)	21.2(192)	NA	NA	NA	NA
C Miles (acres) of dunes disturbed	0	0	2(24)	0	0	0
Both pipelines	0	0	NA	NA	NA	NA
S Number of federally protected species affected	0	0	1	1	0	0
Both pipelines	0	0	NA	NA	NA	NA
S Number of state-protected species affected	0	0	1	1	0	0
Both pipelines	0	0	NA	NA	NA	NA
S Desert tortoise crucial habitat crossed	No	No	No	Yes	Yes	No
S Desert bighorn critical habitat crossed	No	No	No	No	Yes	No
Socioeconomics						
C Percent increase in county tax base	0.19	0.28	San Bernardino 0.26	0.4	3.4	3.7
			Riverside 0.10	0.2		
Both Pipelines	0.38	0.56	NA	NA	NA	NA
Land Use And Recreation						
S Miles (acres) of FPA or WSA crossed						
Celeron/All American	8.2(99)	0	0	2.3(28)	0	0
Getty	3.2(39)	0	NA	NA	NA	NA
Both pipelines	11.4(138)	0	NA	NA	NA	NA
C Miles (acres) of irrigated cropland crossed						
Celeron/All American	1(12)	1(12)	0	0	0	0
Getty	1(6)	1(6)	0	0	0	0
Both pipelines	2(18)	2(18)	NA	NA	NA	NA
C Miles (acres) of National Wildlife Refuge crossed	0	0	0	0	25(303)	0
Both pipelines	0	0	NA	NA	NA	NA
S Number of National Forest campgrounds affected						
Celeron/All American	2	0	0	0	0	0
Getty	3	0	0	0	0	0
Both pipelines	3	0	NA	NA	NA	NA

Code[2]	Celeron/ All American and Getty Proposals[3]	Santa Maria Canyon Alternative	Celeron/ All American Proposal[3]	Desert Plan Alternative	Celeron/ All American Proposal[3]	Brenda Alternative
Cultural Resources						
C Number of known sites within the ROW[6]	4	3	1	3	29	3
Both pipelines	4	3	NA	NA	NA	NA
S Number of sites within the ROW considered eligible for the National Register[7]	2	0	0	3	0	0
Both pipelines	2	0	NA	NA	NA	NA
Visual Resources						
S Acres of significant visual change in LPNF						
Celeron/All American	92.17	26.62	NA	NA	NA	NA
Getty	92.14	26.62	NA	NA	NA	NA
Both pipelines	184.31	53.24	NA	NA	NA	NA
S Significant visual change at pump stations	0	0	0	0	0	0
Both pipelines	0	0	NA	NA	NA	NA
Noise						
S High noise levels (60 dBA) near residences	Yes	Yes	No	No	No	No
Oil Spill Potential						
C Spill probability for new pipeline (spills/alternative/yr)	0.0078	0.0114	0.0342	0.0573	0.0144	0.0162
Both pipelines	0.0156	0.0228	NA	NA	NA	NA
C Spill probability for 40-year old pipeline (spills/alternative/yr)	0.0234	0.0342	0.1026	0.1719	0.0432	0.0486
Both pipelines	0.0468	0.0684	NA	NA	NA	NA
S ROW crosses areas sensitive to an oil spill	Yes	Yes	No	No	No	No

[1]Impact values include the implementation of the committed mitigation measures presented in Chapter 4.

[2]C = area of concern (as identified during scoping) with no significant impact
H = potential geologic or hydrologic hazard to the pipeline
S = significant impact from pipeline construction or operation (details can be found in Chapter 4)

[3]Impact values for the Celeron/All American and Getty proposals are for the segments of pipeline that would be be replaced by the respective alternative and not the complete pipeline route.

[4]Not Applicable.

[5]Acreage figures reflect the worst-case assumption that both pipelines would be constructed on separate ROWs.

[6]Differences in the number of known sites also reflect differences in the number and intensity of surveys that have been conducted and in the site recordation methods that were used. The Class III inventory is expected to identify additional sites.

[7]Insufficient information exists to assess the National Register eligibility of all known sites with the ROW. The cultural resources compliance plan will minimize significant impacts to sites determined to be eligible for the National Register.

TABLE 2-10

SUMMARY OF SIGNIFICANT IMPACTS[1] AND HAZARDS FOR THE McCAMEY TO FREEPORT ALTERNATIVE

Code[2]		
General		
C	Linear miles (acres) of land disturbed	460(5,575)
Geology		
H	Number of Quaternary faults crossed	4
H	Number of unstable slope areas crossed	0
Soils		
C	Miles (acres) of sensitive soils crossed	460(5,575)
Surface Water		
C	Number of perennial stream crossings	17
H	Number of streams with degrading channels crossed	0
H	Number of streams with flood hazard crossed	7[3]
C	Number of streams with municipal water supply crossed	0
Groundwater		
S	Miles of sensitive groundwater basins crossed	280
Aquatic Biology		
S	Number of perennial streams crossed with important permanent fish species	NAV[4]
Terrestrial Biology		
S	Miles (acres) of riparian vegetation disturbed	NAV
S	Miles (acres) of oak woodland disturbed	NAV
C	Miles (acres) of dunes disturbed	NAV
S	Number of federally protected species affected	11[5]
S	Number of state-protected species affected	35[5]

TABLE 2-10 (CONTINUED)

Code[2]		
S	Desert tortoise crucial habitat crossed	NA
S	Desert bighorn critical habitat crossed	NA
Socioeconomics		
C	Maximum percent increase in county tax base (county)	6.4(Kimble)
Land Use And Recreation		
S	Miles (acres) of FPA or WSA crossed	NA (No Forest Service or BLM-managed lands would be crossed in Texas)
C	Miles (acres) of irrigated cropland crossed	NAV
C	Miles (acres) of National Wildlife Refuge crossed	0
S	Number of National Forest campgrounds affected	NA
Cultural Resources		
C	Number of known sites within the ROW	NAV
S	Number of sites within the ROW considered eligible for the National Register	NAV
Visual Resources		
S	Acres of significant visual change in National Forests	NA
S	Significant visual change at pump stations	NAV
Noise		
S	High noise levels (60 dBA) near residences	Yes
Oil Spill Potential		
C	Probability spill greater than 9.5 barrels for new pipeline (spills/yr for overall length)	0.32
C	Probability spill greater than 9.5 barrels for 40-year old pipeline (spills/yr for overall length)	2.07

TABLE 2-10 (CONTINUED)

Code[2]		
S	ROW crosses areas sensitive to an oil spill	Yes

[1]Impact values include the implementation of the committed mitigation measures presented in Chapter 4.

[2]C = area of concern (as identified during scoping) with no significant impact
H = potential geologic or hydrologic hazard to the pipeline
S = significant impact from pipeline construction or operation (details can be found in Chapter 4)

[3]Other perennial streams may pose a flood hazard but stream gage information is not available.

[4]Since fish distribution information is summarized for geographical areas in Texas rather than by stream, occurrence of permanent fish species is not available at this time.

[5]Based on species occurring in counties crossed by the pipeline.

NAV = Sufficient information is not available at this time to quantify impact.

NA = Not Applicable.

2.13 Energy Efficiency/Energy Conservation Analysis

An energy efficiency and energy conservation analysis was completed as part of this EIR/EIS. Data supplied by the applicants was compared with industry standards. The following sections summarize the results of the data review and conclusions on energy consumption relative to efficiency and conservation.

2.13.1 Energy Efficiency

Energy consumption patterns that would be influenced by installation of the proposed pipelines would be those potentially associated with the transport of crude oil between the pipeline inlet and outlet terminals. It is believed that current barge traffic to California refineries would be largely unaffected by the pipelines. The transportation mode most likely to be affected would be tanker traffic to the Gulf Coast. The existing energy setting analysis is therefore confined to this method.

Table 2-11 lists 1982 estimated energy consumption for tanker shipments of crude oil to the Gulf Coast from the Santa Barbara Channel. This traffic is dominated by Exxon's Hondo lease loadings. Exxon has assigned five steam ship tankers to this service - three 41,000 DWT (deadweight tons) and two 52,000 DWT. Since the estimated energy consumption per barrel transported is less than 1 percent between the two sizes, estimates are based on an average of the two. Note that ship propulsion accounts for more than 90 percent of the energy needed.

Energy needed for pipeline construction has been estimated from the applicants' permit applications and has been substantiated by comparison with other projects. Table 2-12 summarizes estimated construction energy requirements. Energy required for construction operations would largely be governed by two factors: the efficiency of the equipment and the manner in which it is operated. Construction personnel have direct control only over operation. The trend in recent years has been toward design of more energy-efficient construction equipment.

Energy consumption for pipeline operation consists of two major uses, pumping and crude heating. The two are interrelated in that much of the OCS crude cannot be pumped unless its viscosity is reduced by raising the temperature. Furthermore, once a viscosity suitable for pumping is reached, additional heating (within temperature limits imposed by breakdown of the crude) reduces pumping energy requirements. Pumping energy consists of two major components: elevation and pipe friction. The elevation component is the energy needed to lift the crude from the inlet to the outlet and is therefore largely beyond the control of pipeline design. Pipe friction is the flow resistance the crude meets as it travels through the pipe. With a given flow rate, pipe friction can be reduced by increasing the pipe size and/or, as noted above, by reducing the crude viscosity. Pipe friction would be the predominant pumping energy component with all three pipelines, accounting for more than 90 percent of total energy.

TABLE 2-11

ESTIMATED 1982 CRUDE TANKER ENERGY REQUIREMENTS

SANTA BARBARA CHANNEL TO GULF COAST

	Million Btu/yr	Btu/bbl	Percent of Total
Propulsion	4,014,900	297,400	92.2
Hoteling (docked in port)	52,650	3,900	1.2
Crude Pumping	122,580	9,100	2.8
Crude Heating	163,350	12,100	3.8
TOTALS	4,353,750	322,500	100.0

NOTES:

1. Based on 1982 Hondo production of 13.5 million bbl and average energy consumption of 41,000 DWT and 52,000 DWT steam ship tankers.

2. Estimated cargo capacities: 41,000 DWT: 257,000 bbl
52,000 DWT: 327,000 bbl

Sources: Purvin & Gertz, Inc. 1983.

Bay Area Air Quality Management District: Chevron Lube Oil Project Application, March 1982

TABLE 2-12

ESTIMATED CONSTRUCTION ENERGY

	Las Flores to Emidio				Emidio to McCamey	
	Celeron		Getty		All American	
	Gallons	mm Btu	Gallons	mm Btu	Gallons	mm Btu
Diesel Fuel						
Total	281,200	39,400	240,000	33,600	1,239,000	173,500
per mile	2,200	308	2,100	294	1,200	168
per day	N/L[1]	N/L	N/L	N/L	1,600	224
Gasoline						
Total	92,700	11,600	135,000	16,900	408,500	51,100
per mile	700	88	1,200	150	400	50
per day	N/L	N/L	N/L	N/L	500	63

Sources: Celeron/All American and Getty

[1]Not listed

The predominant pumping energy source would be utility-supplied electricity. There are, however, certain remotely located stations on the Emidio to McCamey route where, because of the distance to electricity sources, it would be more cost-effective to install combustion gas turbines in lieu of electric motors. Turbines develop a substantial amount of reject heat (which is usually wasted) that would be recovered and used for part of the crude heating. Supplementary direct-fired crude heaters would also be needed since there would not be enough turbine reject heat.

Under the maximum through-put scenario used for the energy efficiency analysis (400,000 BPD for Getty and 300,000 BPD for Celeron), neither the Getty nor the Celeron Las Flores to Emidio line would require heating at the supply inlet. The crude would already be at pumping temperature from previous treating processes along the pipeline route and the oil would retain adequate heat to be pumped all the way to Emidio.

The length of the Emidio to McCamey line would require heating stations at Emidio and intermediate locations to maintain proper pumping viscosities. These would be located at the pumping stations. Utility-supplied natural gas would be the primary fuel for crude heating and combustion turbine opeartion. All of the pipelines would be buried to a cover depth of 3 to 4 ft. This reduces heat losses substantially below those of bare pipes above ground. Insulation would reduce heat losses even further. Two inches of polyurethane, the insulation envisioned for parts of the proposed pipelines, reduces heat losses to approximately one-third those of buried bare pipe. The Celeron Las Flores to Emidio line would be insulated for its entire length to avoid additional heating stations. Insulation on the Emidio to McCamey line would be based on an economic balance between energy cost and insulation capital cost. The applicants' estimate was based on the relative costs of energy and insulation at the time the estimate was made. If the cost of energy relative to the cost of insulation increases, more insulation would be justified. Insulation for the three pipelines would be as follows:

- Las Flores to Emidio (Celeron) - Entire length of approximately 122 miles.

- Emidio to McCamey (All American) - 20 miles downstream from each heating station, a total length of approximately 240 miles.

- Getty - to be determined during engineering.

Applicants have assumed efficiencies of 75 percent for the pumps and 80 percent for the heaters. These are lower than expected actual efficiencies of 80 percent for pumps and 90 percent for heaters. The lower values were selected to provide a conservative evaluation. The EIR/EIS staff has calculated both pumping energy and heating energy and the results agree substantially with those developed by the applicants. Pipeline operating energy would be governed by the efficiency of the equipment, the design of the pipeline system, and the operating practices. The expected pump and heater efficiencies would be in the range of optimum commercially available equipment, and the centralized control systems would permit the pipelines to be operated efficiently. Training and supervision of pipeline operating personnel would also ensure efficient operation. Estimated pipeline operating energy is summarized in Table 2-13.

Changes in routing between terminal points would have an effect on energy consumption, but the alternative routes analyzed would change estimated energy usage less than the estimating precision.

The no-project alternative envisions transporting the surplus OCS crude to the Gulf Coast via tanker ships small enough to negotiate the Panama Canal. The "Panama" tankers are in the size ranges used for calculating energy use under the existing setting for energy. Larger tankers would require transferring crude to small vessels at the Canal or retrofitting the existing pipeline across Panama for heated crude. Energy estimates in the existing energy setting are based on steam-powered vessels. Energy savings are prompting a trend toward motor (diesel) ships instead of steam ships. Table 2-14 presents an estimated operating energy consumption comparison between the two types of tankers and the proposed pipelines. As noted, the energy required for transporting crude oil to the Gulf Coast by pipeline would be about 60 percent of that required for ship transportation. With crude available in sufficient quantity to utilize the proposed pipelines, they would constitute an energy-effective transport method.

2.13.2 Energy Conservation

Two techniques were evaluated for energy conservation. The first was to use co-generation to provide heat and electricity for the heating/electric pumping stations. At most stations the heat load would probably support sufficient power to heat the oil, generate electricity for the pumps, and still transmit excess electricity to local electric utilities. The limiting factors appear to be the cost of installing the appropriate transmission line systems, especially in Arizona, and the potential for air quality permit conflicts in non-attainment areas and areas near Class I air units. This measure would be applicable only to All American pipeline assuming no heaters are necessary for the Las Flores to Emidio segment. All American feels the additional capital expenditures for the heat generation and transmission lines would not be off-set by potentially lower operating costs.

The second possible measure would be to use insulation on uninsulated pipeline segments. The Getty pipeline and portions of the All American Emidio to McCamey line would be uninsulated. However, both companies will complete their final design on the most cost-effective means of moving the crude oil, and this analysis would result in the use of insulation proportional to economic gain. Based on the maximum volumes of 400,000 BPD for Getty and 300,000 BPD for All American and 30-inch pipelines, each company has insulated to the extent necessary to optimize the cost for operation. No inefficient operation or wasteful use of energy has been identified.

TABLE 2-13

ESTIMATED PIPELINE OPERATING ENERGY BASED ON FULL LOAD OPERATION

	Las Flores to Emidio		Emidio to McCamey
	Celeron	Getty	All American
BPD	300,000	400,000	300,000
Pumping Power			
Brake Horsepower	13,405	31,000	68,873
Average Kilowatts[1]	11,111	25,696	57,088
Kilowatt-hours (Kwh)/bbl	0.9	1.5	4.6
Kwh/bbl: Las Flores-McCamey	NA[2]	NA	5.5
Heating Fuel			
Million Btu/hr	NA	NA	716.2
Btu/bbl	NA	NA	57,300
Total Primary Energy[3]			
Million Btu/hr	122.2	282.7	1,373.4
Btu/bbl	9,800	17,000	109,900
Btu/bbl: Las Flores-McCamey	NA	NA	119,700
Combustion Turbine Fuel[4]			
Million Btu/Hr	NA	NA	219.3
Btu/bbl	NA	NA	17,544

Sources: Celeron/All American and Getty

[1]Average kilowatts based on 90 percent electric-line to motor-shaft efficiency.

[2]Not Applicable

[3]Total primary energy is based on total fuel expended for power and heating. Assumed power generation heat rates: Central generating station: 11,000 Btu/Kwh. Combustion turbine: 12,500 Btu/Kwh.

[4]Combustion turbine fuel is included in pumping power and in total primary energy.

TABLE 2-14

COMPARISON OF ESTIMATED OPERATING ENERGY CONSUMPTION

	Estimated Operating Energy 1,000 Btu/bbl Celeron/All American	
Pipelines		
Las Flores to Emidio	9.8	
Emidio to McCamey	109.9	
McCamey to Baytown[1]	50.0	
TOTALS	169.7	
	Steam Ship	Motor Ship
Tankers		
Propulsion	297.4	225.4
Hoteling, Pumping, Heating	25.1	25.1
TOTALS	322.5	250.5

Sources: Celeron/All American and Robert Brown Associates

Note: Estimated energy of the proposed pipelines averages about 60 percent of tanker energy.

[1]Energy for McCamey to Baytown is based on Emidio to McCamey prorated an estimated distance of 500 miles.

3.0 AFFECTED ENVIRONMENT

3.0 AFFECTED ENVIRONMENT

3.1 Introduction

This EIR/EIS analyzes the environment that would be affected by the proposed Celeron/All American and Getty Pipeline projects. The study area varies with different resources. For some land-based resources the affected area would be confined to the immediate area of disturbance. For other resources, such as an air quality and socioeconomics, a regional study area was utilized. The study area is included in the description of the affected environment for each resource.

For each resource except socioeconomics, the description of the affected environment is discussed by pipeline segment. Three segments were defined for this purpose and are identified as: 1) the Las Flores to Emidio, California, segment; 2) the Emidio to Blythe, California, segment; and 3) the Blythe to McCamey, Texas, segment. The Las Flores to Emidio segment includes both the 113-mile proposed Getty route and Celeron's proposed 121.5-mile route. The Emidio to Blythe segment covers 294 miles of All American's proposed route, and the Blythe to McCamey segment covers the remaining 790 miles of the All American portion of the pipeline route.

Resources which would not be significantly affected by implementation of the Celeron/All American and Getty proposals or the alternatives, and resources related to issues which were not raised in the public scoping process or by agencies are not discussed in detail. The criteria for determining the significance of impacts and the assumptions for the analysis for each resource are described in Chapter 4.

3.2 Celeron/All American and Getty Proposals

3.2.1 Air Quality

3.2.1.1 Meteorology and Climatology

Las Flores to Emidio. The Las Flores to Emidio segment traverses three meteorologically distinct subregions. Climatic characteristics of each are discussed below in terms of the implications to pollutant transport and dispersion.

The first meteorologically distinct area is the coastal pipeline leg from Las Flores west to Gaviota. This area is characterized by a Mediterranean type climate with warm dry summers and mild damp winters. Winds in the western Santa Barbara channel are primarily from the northwest and of moderate strength. Along the coast the prevailing flow is modified during the warm months by a sea breeze regime in the afternoon and by downslope drainage winds from the steep terrain abutting the coast at night. The orientation of the Santa Ynez Mountains acts to shelter the coastal portion of the route from the strong winds experienced north of Point Conception. Reduced visibility is a common feature of the coastal region during the summer months due to a high frequency of fog and low stratus. Visibility less than 1 mile and cloud ceilings below 300 feet (ft) both occur about 10 percent of the time from July through October. Throughout the summer a persistent elevated inversion is established offshore that restricts the vertical mixing along the coast. During the winter elevated inversions in the area are generally weaker and less frequently established because of occasional passage of frontal systems.

The proposed pipeline routes turn north near Gaviota and higher terrain is encountered over the Santa Ynez and Sierra Madre Mountain ranges. A gradual weaking of the maritime climatic characteristics along the coast is experienced as the route penetrates further into the mountains. Climatological data for this region are generally unavailable, but it is reasonable to expect stronger winds along the ridge tops with highly localized terrain channeling effects influencing the winds in the canyons and small valleys. Diurnal temperature ranges should be greater in the mountains than along the coast and nocturnal surface inversions should be common in terrain depressions. Ventilation is expected to be quite good in exposed areas, but weaker and highly variable in sheltered areas. Beyond the crest of the Sierra Madre, a confluence of northerly and westerly winds occur along the western San Joaquin Valley slopes.

The third meteorologically distinct area is the southern San Joaquin Valley. This area is characterized by warm, dry conditions. Ninety percent of the annual precipitation falls from October through April. Summers are hot and cloudless. Winters are mild and semi-arid, yet fairly humid. Pollutant dispersion is restricted most noticeably during the late fall through early spring months, when deep surface inversions, stagnant conditions, and low stratus clouds and fog are established. December and January are characterized by frequent fog, mostly nocturnal, which prevails when marine air is trapped in the valley by persistent high pressure. The same synoptic conditions that produce the fog also cause clear skies in the surrounding mountain and desert areas. The winter season produces the most intense pollution episodes experienced in the southern San Joaquin Valley. During the summer, northwest sea breezes ventilate the valley about twice per week on average. When the normal high temperatures persist for several days, the thermal low pressure established over the area causes a sufficient gradient to draw in the cooler coastal air. During prolonged periods of drought, this later afternoon breeze may carry substantial dust which is raised by the thermal instability to levels as high as 7,000 ft above the valley floor (NOAA 1982).

Temperature and precipitation data for this segment are summarized in Table 3-1.

<u>Emidio to Blythe</u>. Meteorological measurements across the desert area are sparse, but the area is sufficiently homogeneous climatically to allow adequate characterization on the basis of existing data. Seasonal variability in the Southeast Desert occurs mostly in terms of large temperature differences and not by precipitation levels which are uniformly low. During winter the area is covered by moderately intense anticyclonic circulation except during occasional periods of frontal activity (20 to 30 on average from October through March in the northern

part of the basin). Such frontal systems are relatively weak by the time they reach the basin and become more diffuse as they move southward. However, most of the precipitation received in the area is associated with frontal activity with local amounts strongly influenced by topographic features.

TABLE 3-1

SUMMARY OF TEMPERATURE AND PRECIPITATION DATA ALONG THE PIPELINE ROUTE

Location	January Mean Temp (°F) Min	January Mean Temp (°F) Max	July Mean Temp (°F) Min	July Mean Temp (°F) Max	Annual Precipitation (inches)
Las Flores to Emidio:					
Gaviota, CA[1]	44	63	55	72	~12.0
Santa Maria, CA[2]	38	63	52	72	12.13
Bakersfield, CA[2]	37	58	69	99	5.91
Emidio to Blythe:					
Mojave, CA[1]	28	56	68	96	~7.0
Blythe, CA[1]	40	68	80	108	3.96
Blythe to McCamey:					
Phoenix, AZ[1]	35	64	75	105	7.20
Tucson, AZ[1]	38	64	74	98	11.20
Deming, NM[1]	26	55	66	96	8.84
El Paso, TX[2]	30	57	70	95	8.51
McCamey, TX[1]	33	61	72	96	--

Sources:
[1]Climates of the States, NOAA 1974.
[2]Local Climatological Data, Annual Summary with Comparative Data, NOAA 1982.

During the summer, the Pacific high is well developed to the west of California and a thermal trough of low pressure covers the basin with the intensity and orientation of this low varying from day to day. Air exchange with coastal areas and the Central Valley occurs primarily through the mountain passes. Relative humidity is very low, averaging 30 to 50 percent in the early morning and 10 to 20 percent during the late afternoon. Intense heating during the day and marked cooling at night are normal during summer. The intensity of the solar radiation is conducive to photochemical smog formation.

The desert region is generally windy in summer with strong convective exchange between upper and lower atmospheric levels. During the winter, rapid nocturnal cooling at the surface retards such exchange, and calm conditions are recorded frequently. During all seasons the predominant winds are from the south and west.

Temperature inversion conditions in the Southeast Desert Air Basin (SEDAB) are different from those in the coastal regions to the west. Subsidence inversions are typically 6,000 to 8,000 ft above the desert surface. Radiation inversions are prevalent at night thoughout the year. These tend to be dissipated early in the day in summer but persist through much of the day during the calmer winter months. Such wintertime inversions can develop to heights of 200 to 2,000 ft.

Temperature and precipitation data for this segment are summarized in Table 3-1.

Blythe to McCamey. A general description of the climate of this region can be compiled from information at various points along the route. Yuma, Arizona is near the proposed California-Arizona border crossing of the pipeline system. Climate in Yuma is definitely of a desert type. Precipitation amounts are extremely small. In the late summer and fall, precipitation is generated by convective thunderstorms; in winter by occasional west-to-east travelling frontal systems. Prevailing winds are northerly during the winter and southerly during the summer. The hot air rising above the intensely heated surface, draws in moist air from the Gulf of Lower California, such that humidity from mid-July to mid-September is higher than would be expected for a desert area. Temperature inversions are common at night throughout the year but persist further into the daytime hours during winter than in summer. Winds are strongest in summer and lightest in winter.

The proposed pipeline route passes near Tucson in southeastern Arizona. This area is characterized by hot summers and mild winters. Total precipitation averages about 11 inches per year with the largest monthly totals during July and August, the period of maximum thunderstorm activity. Wintertime precipitation occurs as a result of passing frontal systems, but averages less than 1 inch per month from December through February. The prevailing winds throughout the year are southeasterly with moderate speeds. Extreme winds near or above 40 knots can occur during any month and can generate substantial blowing dust.

The weather of El Paso, Texas is indicative of the easternmost sections of the proposed pipeline route, including New Mexico and west Texas. The climate of the area is characterized by abundant sunshine throughout the year, high but not extreme daytime summer temperatures with very low humidity, scanty rainfall, and a relatively mild winter season that is typical of arid areas at low altitudes. About half of the annual precipitation in all forms occurs during the three-month period from June through September, primarily from brief but sometimes intense thunderstorms. Small amounts of snow are received during most winters, but snow cover rarely amounts to more than 1 inch and seldom remains on the ground for more than a few hours.

The area can experience strong, gusty winds with accompanying dust storms during any season. The latter are most common in March and April and comparatively rare from July through December. Visibility reductions to 6 miles average about 40 hours a month during March. The prevailing winds are from the north during winter and from the south during summer with a fairly uniform average speed distribution except during the spring months.

Temperature and precipitation data for this segment are summarized in Table 3-1.

3.2.1.2 Air Quality

The existing air quality conditions of the threee primary segments of the proposed pipelines are given below. The nonattainment (NA) areas found along the proposed routes are also identified. An area may be designated as NA for a pollutant by not meeting the National Ambient Air Quality Standards (NAAQS). Any stationary source proposing to locate in an NA area is subject to the requirements of New Source Review for those pollutants for which the source is major (i.e., has a potential to emit 100 tons per year or more of a regulated pollutant) and for which the area is designated NA. If the area is not NA, then the Prevention of Significant Deterioration (PSD) regulations apply. In this case it must be shown through modeling that any proposed new major source does not violate applicable PSD increments (see Appendix A) and that the proposed source together with other sources in the PSD area do not violate any NAAQS).

Las Flores to Emidio. This section of the proposed route passes through the South Central Coast and San Joaquin Valley Air Basins of California and is mostly within Santa Barbara County and Kern County. Both the NAAQS and the California Ambient Air Quality Standards (CAAQS) apply in California. Both sets of standards are summarized in Appendix A. Only the north coast portion of Santa Barbara County is NA for total suspended particulates (TSP). The proposed routes are about 7 miles to the east of this NA. The south coast portion is NA only for carbon monoxide (CO). No part of Santa Barbara County is NA for either nitrogen dioxide (NO_2) or sulfur dioxide (SO_2). The San Joaquin Valley portion of Kern County is NA for SO_2, and TSP. Only the Bakersfield area, which is 20 miles north of the Emidio pump station, is NA for CO. No portion of Kern County is NA for NO_2.

The nearest air quality monitors within Santa Barbara County are at El Capitan, Santa Ynez, and Santa Maria. The observed air quality at these monitors is summarized for the years 1980, 1981, and 1982 in Appendix A. None of the applicable standards for NO_2 or SO_2 were violated during the three-year period at Santa Maria. There were, however, violations of the state and Federal TSP standards in El Capitan and Santa Maria for the 24-hour (about 7 days/year) and annual averaging periods. It should be noted that some question has been raised as to the representativeness of the El Capitan TSP monitor located near the ocean, because of possible interference from sea salt (SBCAPCD, 1982). No CO data are available near the pipeline route.

In Kern County, the nearest location for gaseous pollutant monitoring is Bakersfield, about 20 miles from the proposed route. Taft, in southwestern Kern County is the particulate monitor nearest to the path of the proposed pipeline. The air quality data for 1980, 1981, and 1982 are summarized in Appendix A. The Bakersfield monitor shows violations of the NAAQS (about 25 days/year) and CAAQS (about 75 days/year) for ozone for all three years. The Federal annual NO_2 standard was also exceeded in Bakersfield for 1982. In addition, the Federal annual SO_2 standard was violated in 1980, and the state and Federal 8-hour CO standards were violated (about 2 days/year) in all three years listed. The annual and 24-hour average state and Federal TSP standards were violated in both Bakersfield (about 20 days/year) and Taft (about 10 days/year) all three years with the exception of the 1982 24-hour average in Bakersfield, which was just below the standard.

Emidio to Blythe. The majority of this segment is within the SEDAB. The summary of Kern County air quality data given in Appendix A and discussed above also applies to the initial link of the Emidio to Blythe pipeline section. Local authorities responsible for air pollution control along the Emidio-Blythe leg of the proposed pipelines include the Kern County APCD, the San Bernardino Desert APCD, and the South Coast Air Quality Management District (SCAQMD) which administers Riverside County. Along this segment of the pipeline, the only NA area encountered is for ozone (O_3); the NA area begins at the Kern County-San Bernardino County border and includes the Twelve-Gauge Lake heat station and the Cadiz tank farm.

There are currently no air quality monitors in the Tehachapi Mountains, which separate the San Joaquin Valley Air Basin and the (SEDAB). In the SEDAB, Barstow is the only gaseous pollutant monitoring station along the pipeline route. The Twentynine Palms monitoring station, approximately 37 miles southwest of Cadiz is the only other gaseous pollutant monitor in the general vicinity of the pipeline within the SEDAB. The air quality data for Barstow and Twentynine Palms are summarized for the years 1980, 1981, and 1982 in Appendix A. TSP data for the towns of Mojave and Boron are also summarized in Appendix A. As can be seen, O_3 and TSP are the main air quality concerns in the SEDAB during the three years listed. For ozone, the NAAQS and CAAQS were exceeded all three years in Barstow (about 40 days/year) and the CAAQS was violated in Twentynine Palms (about 30 days/year). There were violations of applicable 24-hour (about 10 days/year) and annual average TSP standards at the locations listed with the exception of the annual geometric mean at Twentynine Palms. The CAAQS was also exceeded one time for 1-hour average NO_2 concentration in Barstow during 1981.

In the northwestern Mojave Desert, visibility is generally good. The average visual range is about 30 miles in the area; however, blowing dust can reduce the visual range to under 1 mile (Kelso 1984). The best visibility (visual range >60 miles) occurs in the winter, during northerly flow.

Blythe to McCamey. State ambient air quality standards in Arizona and Texas are identical to the NAAQS. In New Mexico the ambient standards differ from the NAAQS and are generally more stringent. A comparison between the New Mexico standards and the NAAQS is given in Appendix A. State agencies responsible for air pollution control activities in the three states traversed by the Blythe to McCamey segment are the Arizona Department of Health Services, Air Quality Division; the New Mexico Health and Environment Department, Environmental Improvement Division, Air Quality Bureau; and the Texas Air Control Board. The proposed pipeline route cuts through only one NA area in Arizona, the San Manuel SO_2 NA area. The proposed Tom Mix pump station is approximately 10 miles from this NA area. The pipeline passes north (>10 miles) of the Tucson NA area for CO and TSP and south (>7 miles) of the Phoenix NA area for O_3, CO, and TSP. The pipeline would not pass through or near any NA areas in New Mexico. In Texas, parts of El Paso County are NA for TSP and the entire county is NA for O_3.

In Arizona, there are nearby air quality monitoring stations in all counties through which the pipeline route passes except in Yuma County. Air quality data for the stations in Buckeye, Maricopa, Coolidge, and Willcox are summarized in Appendix A for 1980, 1981, and 1982. At the monitors listed, the only violations of NAAQS were for TSP at Buckeye (24-hour and annual) and Coolidge (annual only). TSP violations are frequently caused by wind-blown dust and occur several times each year.

The monitoring stations nearest the proposed pipeline route in New Mexico are Lordsburg, Deming, and Anthony. The air quality data for these sites are summarized in Appendix A for the years 1980, 1981, and 1982. The applicable TSP standards are violated consistently along the proposed pipeline route, most likely due to wind-blown dust.

In Texas, El Paso and Odessa are the only air quality monitoring locations in the vicinity of the proposed pipeline route. Since the air quality data for Anthony, New Mexico that were presented above are more representative of the conditions near the pipeline at the New Mexico-Texas border, only the Odessa data will be presented here. The 1980, 1981, and 1982 air quality data for Odessa are summarized in Appendix A. The 24-hour and annual secondary TSP standards were violated in 1980, 1981, and 1982. It should be noted that fugitive dust represents a substantial portion of the TSP measured in Odessa. No other air quality standards were violated during the years listed.

3.2.2 Geology

3.2.2.1 Las Flores to Emidio

Geology and Physiography. The Las Flores to Emidio segments of the proposed pipeline alignments would cross several major geologic/physiographic provinces; from west to east these are the Transverse Ranges, the southern Coast Ranges, and the Great Valley. This segment of the route is diverse in terms of topography, varying from very low relief in the Cuyama Valley to rugged terrain in the Gaviota Gorge and Sierra Madre Mountains. Geologic conditions also vary, but to a lesser degree. Most of the route is underlain either by alluvium and colluvium, or by Mesozoic to Cenozoic-age sedimentary rock. Significant geologic and topographic conditions within each province, proceeding along the alignment from Las Flores toward Emidio, are summarized in Table 3-2.

Faulting and Seismicity. The applicants' proposed routes from Las Flores to Emidio traverse a region of moderate to high historic seismicity. The larger, damaging events (≧ magnitude 5) have generally occurred in the Santa Barbara Channel and coastal area, and the southern

TABLE 3-2

GEOLOGIC/PHYSIOGRAPHIC CONDITIONS

LAS FLORES TO EMIDIO

Location	Geologic/ Physiographic Province	Geologic Unit	Age	Topography	Comments
Las Flores to Buellton	Transverse Ranges	Sedimentary rock	Tertiary	Locally high relief, steep slopes	Predominantly firm, locally hard rock
Santa Ynez Valley	Southern Coast Ranges	Alluvium	Recent	Very low relief, local steep banks	Loose, saturated sand and gravel
Buellton to Sisquoc Ranch	Southern Coast Ranges	Sedimentary rock colluvium, alluvium	Miocene to Plio-Pleistocene; Recent	Low to moderate relief, moderate slopes	Weak to firm rock; unconsolidated surficial deposits
Sisquoc Valley	Southern Coast Ranges	Alluvium	Recent	Very low relief, local steep banks	Loose, saturated sand and gravel
Sierra Madre Mountains	Southern Coast Ranges	Sedimentary rock, minor colluvium, alluvium	Lower Cretaceous to Upper Miocene; Recent	High relief, steep slopes, deep narrow drainages	Firm to moderately hard rock; unconsolidated gravelly alluvium
Cuyama Valley	Southern Coast Ranges	Alluvial fans, alluvium	Pleistocene; Recent	Low to very low relief	Older fan deposits partly consolidated; alluvium loose, saturated
San Emigdio Mountains	Southern Coast Ranges	Sedimentary rock	Middle to Late Tertiary	Moderate relief, moderate slopes, locally badlands topography	Relatively soft, erodible rocks and surficial deposits
San Joaquin Valley	Great Valley	Alluvial fans	Late Pleistocene to Recent	Very low relief	Partly consolidated deposits

Sources: Jennings (1959), (1958); Smith (1964); Jennings and Strand (1969); Dibblee (1950), (1984a); Woodring and Bramlette (1950); Vedder and Repenning (1975); Hall (1978).

San Joaquin Valley/Sierra Nevada boundary region (Real et al. 1978). Included among these historic events are the damaging events near Los Alamos during 1902 and 1915 (several of which are estimated as ≥ magnitude 6), the magnitude 6.3 Santa Barbara earthquake of June 29, 1925, and the July 21, 1952 magnitude 7.7 Kern County event (Livingston and Associates/Moore and Taber 1979). All of these earthquakes caused locally strong to very strong (Modified Mercalli Intensity VII-X) ground shaking in areas traversed by the pipeline routes. The great Fort Tejon earthquake of January 9, 1857 (estimated as > magnitude 8), although somewhat more distant, caused moderate to strong shaking throughout this area. A thorough account of the historic seismicity in this region is provided by Livingston and Associates/Moore and Taber (1979) and Richter (1955a).

The Transverse Ranges and southern Coast Ranges owe much of their present form to uplift, folding and faulting that occurred in relatively recent geologic time, and is still occurring to some degree. This tectonically active region is cut by a large number of east-west and northwest trending faults, some of which show evidence of Quaternary (within the last 2 million years) to Holocene movement (within the last 11,000 years). The historically active San Andreas fault, a major plate boundary, is traversed by the applicants' routes east of New Cuyama in the San Emigdio Mountains. The South Branch Santa Ynez fault is crossed in the Gaviota Gorge; there is offshore evidence suggesting movement on this fault during or just prior to Holocene time. A detailed discussion of faulting in Santa Barbara County is presented by Livingston and Associates/Moore and Taber (1979). Faulting in the southernmost San Joaquin Valley is described by Dibblee (1955). Table 3-3 provides a summary listing of the Quaternary faults traversed by the pipeline routes, and cites references discussing their age and degree of activity.

Slope Stability. Landslides of varying type, size, and degree of activity are locally present in the hills and mountains traversed by the Getty and Celeron/All American routes. Within Santa Barbara County, the Rincon and Monterey-Point Sal Formations, and serpentines associated with the Franciscan Assemblage have been cited as most susceptible to landsliding (Livingston and Associates/Moore and Taber 1979). These geologic units underlie the pipeline routes at the mouth of Gaviota Canyon, in the Las Cruces Canyon to Gaviota Pass area, and in the northern Purisima Hills. Landslides on or within a few hundred feet of the various routes have been mapped by others (Dibblee 1950, 1984a; Getty 1983b) or interpreted from aerial photographs during this study (see Map 1-2 at the end of this document). Landslides too small to show on published geologic maps, or to see on available aerial photography were observed during ground reconnaissance in stream and river banks throughout the Las Flores to Emidio section, and on oversteepened slopes within the Solomon Hills and the Sierra Madre Mountains. Minor landslides may be present at other locations as well. Evidence of large-scale slope instability was not noted between the west end of the Cuyama Valley and Emidio. However, debris flow channels and deposits are common on the alluvial fans flanking Cuyama Valley.

TABLE 3-3

QUATERNARY FAULTS BETWEEN LAS FLORES AND EMIDIO

Name	Location	Evidence of Holocene Activity (last 11,000 years)	Source
Capitan (Erburu)	Capitan	No	Jennings (1975); Ziony, et al. (1974)
South Branch Santa Ynez	Gaviota Gorge	Yes[1]	Livingston and Associates/ Moore and Taber (1979); Jennings (1975); Greensfelder (1974)
North Branch Santa Ynez	Gaviota Gorge	No	Livingston and Associates/ Moore and Taber (1979); Greensfelder (1974); Sylvester (1984, personal communication)
Santa Ynez River System[2]	Buellton	No	Sylvester (1984, personal communication
Unnamed fault	East of Los Alamos	No	Jennings (1975); ESA photo-interpretation
Big Pine Extension[3]	Solomon Hills	No	Livingston and Associates/ Moore and Taber (1979)
Rinconada	Sierra Madre Mountains	No	Livingston and Associates/ Moore and Taber (1979); Greensfelder (1974)
South Cuyama	South Flank Cuyama Valley	No	Jennings (1975); Livingston and Associates/Moore and Tabler (1979); Dibblee (1984b, personal communication)
San Andreas	San Emigdio Mountains	Yes	Livingston and Associates/ Moore and Taber (1979); Jennings (1975); Greensfelder (1974)

[1]Best evidence for movement during or just prior to Holocene is on interpreted offshore extension of fault (Rice, et al. 1981; Yerkes et al. 1981; Sylvester 1984, personal communication)

[2]Characteristics and displacement during Quaternary not well established

[3]Existence of this fault has not been verified (Livingston and Associates/ Moore and Taber 1979)

Subsidence. Historic subsidence of up to 8 ft, due mainly to groundwater overdrafting, has occurred along the pipeline route in the southernmost San Joaquin Valley between Maricopa and Mettler (Lofgren 1975). However, this subsidence has been essentially stopped since the introduction of surface water via the California Aqueduct (Bertoldi 1984, personal communication; Ireland et al. 1982). Subsidence due to pumping of oil and gas from deeper formations has been reported by Lofgren (1975), but is apparently not occurring at present (Welge 1984, personal communication).

Paleontology. As is generally true of marine sedimentary rocks, most of the Late Mesozoic and Cenozoic-age units along the Las Flores to Emidio route are at least locally fossiliferous. In fine-grained rocks (i.e., mudstone, claystone, or shale) the preserved fossils are commonly microscopic in size and are referred to as microfossils. In coarse-grained rocks (typically sandstone), larger (visible) plant and animal fossils, referred to as megafossils, are present locally. The applicants' proposed routes do not, however, appear to traverse known significant fossil localities (Dibblee 1950; Woodring and Bramlette 1950; Popenoe 1954; Savage and Downs 1954; Vedder and Repenning 1975).

Unique Geologic Features. No unique geologic features of exceptional interest or significance are known to occur along Celeron/All American's or Getty's proposed routes from Las Flores to Emidio (Livingston and Associates/Moore and Taber 1979).

Mineral/Petroleum Resources. No operating or inactive commercial mining operations, other than small construction material (gravel and rock) quarries, occur along the routes from Las Flores to Emidio. The only known mineral resource traversed is an undeveloped deposit of relatively pure diatomite in the northern Purissima Hills near the junction of California State Highway 150 and US 101 (Dibblee 1950).

No operating or inactive commercial sand and gravel operations are crossed by the applicants' proposed routes, although extensive commercial-grade deposits of sand and gravel are present in the Santa Ynez and Sisquoc River Valleys (Goldman 1968) and extraction operations are active in the vicinity of the crossing sites.

Several operating oil and gas fields are traversed between Las Flores and Emidio, including the Capitan, Zaca, Russel Ranch, Midway-Sunset, Yowlumne and San Emidio Nose (California Division of Oil and Gas (CDOG) 1983a, b).

3.2.2.2 Emidio to Blythe

Geology and Physiography. Just east of Emidio the Celeron/All American route enters the Tejon Hills and Tehachapi Mountains of the southern Sierra Nevada Province. Geologic and physiographic conditions in this upland region are quite variable, as summarized in Table 3-4.

From Mojave to Blythe the route is in the Mojave Desert Province. Although discreet ranges of rugged mountains are common within this province, the proposed route generally avoids traversing them, and instead crosses the flanking alluvial fans or intervening basins. The more significant geologic/physiographic features through the desert are briefly described in Table 3-4.

Faulting and Seismicity. Between Emidio and Blythe the applicant's route passes through two areas characterized by moderate to high historic seismicity (Real et al. 1978). The first of these includes the southern San Joaquin Valley seismicity, described previously, and related activity in the Tehachapi Mountains to the east. Most of the larger events in this area were aftershocks of the 1952 Kern County quake (Richter 1955b). A second area of moderate historic seismicity occupies the central Mojave Desert between Barstow and Bagdad. Several magnitude 5.0 to 5.9 events have occurred within about 10 miles of the applicants' route. The largest recorded event in this area was the magnitude 6.2 Manix earthquake of April 10, 1947 (Keaton and Keaton 1977).

The Tehachapi Mountains are roughly bounded by two significant northeast-trending faults, the White Wolf on the northwest and the Garlock on the southeast (see Map 3-1 at the end of this report). Surface rupture occurred along much of the White Wolf fault during the 1954 earthquake (Jennings 1975). The Garlock fault shows clear evidence of significant left-lateral movement during Quaternary time. There is some evidence that local movement on the Garlock fault occurred in the vicinity of the pipeline crossing during the 1952 Kern County earthquake (Buwalda and St. Amand 1955). Several faults traversed in the central Mojave Desert exhibit evidence of movement during the Quaternary (last 2 million years), but not within Holocene times (the last approximately 11,000 years) (Jennings 1975). A list of these relatively young faults is provided in Table 3-5.

Slope Stability. No evidence of major, deep-seated slope instability in the Tehachapi Mountains was observed on aerial photographs or during the ground reconnaissance, nor is any shown on published geologic maps (Dibblee and Warne 1970; Dibblee and Louke 1970). Minor landslides too small to observe on the photos or to show on available geologic maps may, however, be present locally on steep slopes or stream banks. Natural slope instablility is not present along the proposed route within the Mojave Desert Province due to the dry climate and generally subdued topography. Debris flows are locally present on alluvial fans.

Volcanism. The proposed route crosses a lava flow associated within Pisgah Crater near Hector. The age of the Pisgah Crater cinder cone has been described as extremely young by Norris and Webb (1976), while the somewhat older lava flows may be as old as Late Pleistocene (Rogers 1967). Near Amboy a second lava flow is traversed. Estimates of the age of the major volcanism at Amboy range from about 6,000 years (Oakeshott 1976) to less than 2,000 years (Norris and Webb 1976). Oakeshott estimates that a very young lava flow which breached the cinder cone is probably only a few hundred years old. The USGS is currently performing age-dating studies of these volcanics; results should be available within a year (Turrin 1984, personal communication). Work on similar appearing volcanics at the Cima field to the north suggests that the youngest activity is at least pre-Holocene (older than 11,000 years) (Dohrenwend et al. 1984).

TABLE 3-4

GEOLOGIC/PHYSIOGRAPHIC CONDITIONS

EMIDIO TO BLYTHE

Location	Geologic/ Physiographic Province	Geologic Unit	Age	Topography	Comments
Tejon Hills	Great Valley	Sedimentary rock (non-marine); alluvial fans	Tertiary, Quaternary	Low relief, gentle slopes	Poorly consolidated rock and fan deposits
Tehachapi Mountains (east and west slopes)	Southern Sierra Nevada	Granitic rock	Mesozoic	High relief, moderate to steep slopes	Moderately hard rock
Cummings, Brite, and Tehachapi Valleys	Southern Sierra Nevada	Alluvial fans, terraces, alluvium	Quaternary, Recent	Very low to low relief	Poorly to unconsolidated surficial deposits; local bedrock hills
Mojave to Blythe	Mojave Desert	Predominantly alluvial fans	Quaternary to Recent	Very low to low relief, local dry washes	Loose, dry sand and gravel
West of North Edwards	Mojave Desert	Granitic rock	Mesozoic	Low relief	Shallowly buried to locally outcropping, moderately hard to hard rock
East of Kramer Junction	Mojave Desert	Granitic rock	Mesozoic	Low relief	Shallowly buried to locally outcropping, moderately hard to hard rock
Rogers Lake	Mojave Desert	Playa basin deposits, dune sand	Quaternary to Recent	Very low relief to flat	Unconsolidated silt and sand, abundant salts
Troy Lake	Mojave Desert	Playa basin deposits, dune sand	Quaternary to Recent	Very low relief to flat	Unconsolidated silt and sand, abundant salts
Hector	Mojave Desert	Volcanic Rock	Recent	Low relief	Moderately hard to hard rock
Bullion Mountains	Mojave Desert	Volcanic Rock	Cenozoic	Low to moderate relief	Moderately hard to hard rock, may be shallowly buried
Amboy	Mojave Desert	Volcanic rock	Recent	Low relief	Moderately hard to hard rock
Danby Lake	Mojave Desert	Playa basin deposits deposits	Quaternary to Recent	Very low relief to flat	Unconsolidated clay, silt and sand, abundant salts
Rice Valley	Mojave Desert	Dune sands	Recent	Low relief	Locally active windblown sand, small dunes

Sources: Smith (1964); Jennings et al. (1962); Rogers (1967); Bishop (1963); Jennings (1967); Dibblee and Louke (1970); Dibblee and Warne (1970); Dibblee (1967).

Paleontology. The Emidio to Blythe route segment only traverses short sections of geologic units which are known to be significantly fossiliferous. In the Tejon Hills just east of Emidio the alignment appears to cross the Chanac Formation (Smith 1964) from which vertebrate fossils of the Tejon Hills faunas have been collected (Savage and Downs 1954). The other units in which fossils may occur are Tertiary and Quaternary-age lake beds and alluvium as summarized in Table 3-6 (Reynolds 1984, personal communication). An unusual assortment of fossil mammal specimens have been recovered from the geologically similar Manix Lake beds (not on the route) near Barstow (Savage and Downs 1954).

Unique Geologic Sites. No unique geologic features of great scientific interest occur along the proposed route. The relatively young, little weathered lava flows from Pisgah and Amboy Craters, which are traversed by the Celeron/All American route are of some geologic interest, but are not unique in the Mojave Desert (Jennings 1975).

Mineral/Petroleum Resources. No operating or inactive commercial mining operations are present along the proposed route through the Tehachapi Mountains between Emidio and Mojave (Dibblee and Louke 1970;

TABLE 3-5

QUATERNARY FAULTS BETWEEN EMIDIO AND BLYTHE

Name	Location	Evidence of Holocene Activity (last 11,000 years)	Source
White Wolf	Mettler	Yes[1]	Greensfelder (1974); Jennings (1975)
Garlock	Tehachapi Mountains	Yes[2]	Greensfelder (1974); Jennings (1975)
South Lockhart	East of Kramer Junction	No	Jennings (1975)
Lockhart	Hinkley	No	Greensfelder (1974); Jennings (1975)
Harper	Barstow	No	Greensfelder (1974); Jennings (1975)
Calico	Newberry Springs	No	Greensfelder (1974); Jennings (1975)
Pisgah	Hector	No	Greensfelder (1974); Jennings (1975)
Ludlow	Ludlow	No	Greensfelder (1974); Jennings (1975)

[1]Surface fault rupture did not occur at crossing of proposed route during 1952 magnitude 7.7 Kern County earthquake (Buwalda and St. Amand 1955).

[2]Evidence for possible surface fault rupture during 1952 Kern County earthquake reported by Buwalda and St. Amand (1955).

TABLE 3-6

POTENTIAL PALEONTOLOGICAL RESOURCE AREAS, EMIDIO TO BLYTHE

Geologic Unit	Location	Comments
Pleistocene alluvium	Vicinity of Twelve-Gauge Lake pump station (T 10 N, R 4-5 W)	
Quaternary lake sediments	Southeast of Hinkley near Mojave (T 10 N, R 2 W)	
Pleistocene to recent river sediments	Mojave River west of Elephant Mountain (T 9 N, R 1 E)	Fossil mammoth specimens have been found in this unit
Pleistocene to recent river sediments Pleistocene lake sediments	Mojave River west of Daggett (T 9 N, R 2 E) East of Newberry Springs (T 9 N, R 3 E)	34 fossil taxa have been found in this unit.
Quaternary lake sediments	Troy Lake (T 8 N, R 4 E)	
Tertiary lake clays	Pisgah (T 8 N, R 5 E)	
Quaternary lake sediments	Bristol Lake (T 5 N, R 12 E)	
Quaternary lake sediments	Danby Lake (T 1-2 N, R 18 E)	
Quaternary playa sediments	West of Freda siding (T 1 S, R 19 E)	

Source: Reynolds 1984, personal communication.

Dibblee and Warne 1970). This section of the route does, however, pass through the Tejon Hills oil field east of Emidio (CDOG 1983b).

The Mojave Desert province is characterized by a wide range of commercially significant metallic and non-metallic mineral resources (BLM 1982). The Celeron/All American route does traverse mineral resource areas identified by BLM (1980c). These include energy, metallic and non-metallic mineral, and sand and gravel resources, as summarized on Table 3-7.

3.2.2.3 Blythe to McCamey

Geology and Physiography. The proposed pipeline route from Blythe to McCamey, traverses two major geologic/physiographic provinces, the Basin and Range, and the Great Plains. Within the Basin and Range Province the pipeline route generally traverses areas of low relief underlain by alluvial fans and talus flanking the mountain ranges, and alluvial valleys and basins between ranges. Where mountainous terrain is traversed, the route typically crosses pediment surfaces (rock surfaces of very little relief covered by thin surficial deposits), or follows eroded passes with relatively subdued topography.

Alluvial fan and valley/basin deposits underlie the great majority of the proposed route through the Basin and Range Province. Other unconsolidated surficial deposits encountered along the route include young river alluvium and playa lake deposits. Locations and characteristics of these various deposits are described in significant detail for the Sohio Project (BLM 1976 p. 2-74, 75; 2-78, 79; ERT 1976 p. 2A.3-26 through 2A.3-38), and for part of the route, in the Palo Verde-Devers EIS (BLM/NRC 1978 p. 2-6, 7) and supporting documents (Southern California Edison 1977 p. 2.1-19, 20 and Section A-1, Appendix A).

Bedrock occurs at or near the surface in a number of locations along the route within the Basin and Range Province. These include mountain ranges, Quaternary-age lava flows, and pediments which flank many of the deeply eroded mountain ranges. Areas of rock outcrop and pediments traversed along the route are discussed and mapped in the EIS for the Sohio Project (BLM 1976 p. 2-74, 75; p. 2-78, 79; Maps 2.1.3-A through D) and supporting documents (ERT 1976 p. 2A.3-26 through 2A.3-38), together with information on areas of more rugged topography.

Between the Hueco Mountains and Pecos River the proposed route passes through a transitional zone between the Basin and Range and Great Plains Provinces. This area is characterized by generally subdued topography. Rock crops out only locally; most of the route traverses Quaternary-age alluvium flanking the low-relief bedrock hills. The more significant geologic/physiographic conditions encountered in this transitional zone are described in detail in the EIS for the Sohio Project (BLM 1976 p. 2-76, 2-78, 79; Maps 2-1.3-C, D; ERT 1976 p. 2A.3-31 through 2A.3-38). These include the playa lake deposits of the salt basin, locally steep topography in the Guadalupe Mountains, and karst terrain in the Delaware Basin.

TABLE 3-7

MINERAL RESOURCE AREAS WITHIN THE CALIFORNIA DESERT CONSERVATION AREA

Location	Type	Commodity	Comments
North Edwards	Energy	Oil and gas	Leasable; good potential
Lockhart	Energy	Oil and gas	Leasable; good potential
Lavic	Energy	Geothermal	Leasable; undetermined potential
Amboy	Energy	Geothermal	Locatable; undetermined potential
Amboy-Blythe	Energy	Uranium/thorium	Gamma-ray anomalous; potential unknown; scattered occurrences
Ludlow	Metallic	Gold	Current interest in open pit/heap leaching of this commodity in CDCA (Stephens 1984, personal communication); specific interest/activity in this area is unknown
Hector-Lavic	Non-metallic	Zeolite, hectorite	
Milligan	Non-metallic	Gypsum	
Danby Lake	Non-metallic	Sodium, potassium	Leasable; known valuable; previous production (Stephens 1984, personal communication)
Danby Lake	Energy	Solar salt pond	Leasable; project is proposed but no construction has occurred (Hayes 1984, personal communication)
Mojave	Non-metallic	Sand and gravel	
Barstow-Newberry	Non-metallic	Sand and gravel	Previous production; scattered occurrences

Source: BLM (1980c)

From the Pecos River to McCamey the route lies within the Texas portion of the Great Plains Physiographic Province. This region is characterized by generally subdued topography flanking the Pecos River, to locally hilly terrain from Crane to McCamey. Most of the route traverses surficial windblown sand deposits which are locally cemented by calcium carbonate to form a caliche horizon. Soft sedimentary rock underlies the hilly terrain between Crane and McCamey (Barnes 1976; Kier et al. 1977).

Faulting and Seismicity. Historic seismicity between Blythe and McCamey has largely been confined to four areas: southwest Arizona, the southern Arizona-New Mexico border area, the Rio Grande Valley, and near Kermit, Texas. Although no known earthquake epicenters underlie the route itself, an earthquake on May 3, 1887 caused strong, damaging ground shaking throughout southeastern Arizona, southwestern New Mexico, and northern Mexico. Several other historic events have caused minor damage in southeastern Arizona. A detailed discussion of seismicity in this region is presented in supporting documents to the EIS for the Sohio Project (ERT 1976 p. 2A.3-50 through 2A.3-53).

There is no evidence of Late Quaternary or Holocene-age fault activity along the proposed Blythe to McCamey route. Detailed information on known older faults and some suspected buried faults is provided by ERT (1976 p. 2A.3-50 through 2A.3-53)) and the references cited therein.

Slope Stability. For the most part, the pipeline route traverses areas of subdued topography which are not subject to slope instability. Where the alignment crosses more rugged topography, as in the Dome Rock, Peloncillo, and Guadalupe Mountains, rockfalls may be locally present. Bank caving may be present where the alignment crosses major rivers such as the Colorado, Gila, San Pedro, Rio Grande, and Pecos. Debris flows may be encountered on alluvial fans.

Subsidence. Ground subsidence due to groundwater withdrawal is known to be occurring at several locations along the pipeline route in Arizona. A detailed discussion of the causes and effects of this subsidence is presented in the EIS for the Sohio Project (BLM 1976 p. 2-102, 3-24, 25) and supporting documents (ERT 1976 p. 2A.3-53, 2A.3-49).

Karstic Terrain. Karstic terrain is traversed by the proposed route for 20 to 25 miles west of the Pecos River (Kier et al. 1977). This area is characterized by local sinkholes and irregular topography caused by dissolution and erosion of salt beds underlying the area.

Volcanism. Lava flows of Quaternary-age are traversed in Arizona and New Mexico. However, no volcanic activity has been recorded in historic time (past 200 years). Additional information on the location, nature, and age of these volcanic rocks is available in the EIS for the Sohio Project (BLM 1976 p. 2-73, 76, 101; Maps 2.1.3B, C) and supporting documents (ERT 1976 p. 2A.3-26 through 2A.3-35).

Paleontology. The surficial and bedrock units underlying much of the pipeline route are likely fossil-poor to unfossiliferous due to their mode of formation. Units which may be locally fossiliferous include the playa lake beds in the Salt Basin of Texas and the unmetamorphosed sedimentary rocks which crop out in several of the mountain ranges traversed.

Unique Geologic Features. No unique geologic features of exceptional interest or significance are present along the proposed route from Blythe to McCamey.

Mineral/Petroleum Resources. The Celeron/All American pipeline route passes through several of the mineralized belts of Arizona and New Mexico, but does not directly traverse any operating or inactive mining operations. Minor, noneconomic metallic mineral occurrences may locally underlie the route in certain mountainous or pedimented areas. Known, but undeveloped sulfur and potash salt deposits are crossed west of the Pecos River in Texas. Several commercial and private sand and gravel pits and quarries are located close to the alignment in New Mexico and Texas (see BLM 1976 for details). Potential sand and gravel resources are present at the crossings of the Colorado, Gila, San Pedro, Rio Grande, and Pecos Rivers. Oil and gas producing regions underlie the route in the Delaware and Midland Basins and the Central Basin Platform of Texas (Kier et al. 1977).

3.2.3 Soils

The following tables (Tables 3-8, 3-9, and 3-10) summarize the major soil units intersected by the proposed pipeline routes. These tables address each segment of the proposed route (i.e., Las Flores to Emidio, Emidio to Blythe, and Blythe to McCamey). Since the Getty and Celeron routes intersect similar major soil units, they are described as one route from Las Flores to Emidio. Major soil units are grouped by location (i.e., Cañada del Corral to Gaviota Pass) for geographical orientation along the route. Major soil units (i.e., series, associations, land types) with corresponding setting descriptions are listed for each of these locations along the proposed pipeline route.

Soil parameters including slope, depth, texture, and drainage class are described for each major soil unit. These are considered major factors influencing rehabilitation and erosion control. These data support the limiting factor information listed for each major soil unit.

3.2.3.1 Las Flores to Emidio. The major sensitive soil units intersected by this segment of the proposed pipeline route are generally characterized by steep slopes and clayey textures; flood prone and high salinity areas also occur (Table 3-8). Steep slopes with fine-textured (clayey) soils are especially prone to slumping and water erosion problems. These sensitive soils are common from the coast to the Cuyama Valley. Shallow soils are scattered along this pipeline segment, especially from Gaviota Pass to the Cuyama Valley. The Cuyama and San Joaquin Valleys are subject to occasional flooding and contain soils with high salinity, which can slow or inhibit plant growth.

TABLE 3-8

MAJOR SOIL UNITS ALONG LAS FLORES TO EMIDIO ROUTE

Location	Soil Series, Association, land types	Setting	Slope (%)	Depth[1]	Texture	Drainage Class	Limiting Factors
Cañada del Corral to Gaviota Pass	Capitan	Upland areas	30-75	shallow to moderately deep	clay loam	well	Slope, coarse fragments, highly erodible, rock outcrop inclusions
	Ayar	Foothills	30-50	deep	clay	well	Slope, high shrink-swell, highly erodible, subject to landslides
	Diablo	Low hills and broad ridgetops	9-30	deep	clay	well	High shrink-swell, slope, erodible
Gaviota Pass to Los Padres National Forest boundary	Chamise	Dissected high terraces	15-45	deep	shaly loam	well	Slope, highly erodible
	Los Osos	Hills and mountains	30-45	moderately deep	clay loam	well	Slope, highly erodible
	Santa Lucia	Hills and mountains	45-75	shallow	shaly clay loams	well	Slope, depth, highly erodible
	sedimentary rock land	Hills and mountains	6-75	shallow	-	-	Slope, depth, highly erodible, rock outcrop inclusions
	Metz	Sisquoc and Santa Ynez River floodplains	0-2	very deep	loamy sands	somewhat excessively	None
	Mocho	Sisquoc and Santa Ynez River floodplains	0-2	very deep	fine sandy loam	well	None
Los Padres National Forest (800-3,700 ft elevation)	Unnamed	La Brea Creek stream bottom and older alluvial terraces	0-5	deep	gravelly, sandy to moderately coarse, medium	well	Occasional flooding

TABLE 3-8 (CONTINUED)

Location	Soil Series, Association, land types	Setting	Slope (%)	Depth[1]	Texture	Drainage Class	Limiting Factors
	Los Osos - Modesto - Chualar	Mountain uplands	20-70	moderately deep-deep	clay loam - loam	moderately well - well	Slope, erodible, areas prone to slumping, rock outcrop inclusions
Los Padres National Forest (up to 5,700 ft. elevation)	Millerton - Millsholm/ - Agua Dulce	Mountain uplands	30-60	shallow/deep	sandy loam - silt loam	well/ excessive	Slope, depth, very erodible, coarse fragments
	Modesto, Rincon	Mountain uplands and hillslopes	20-50	moderately deep-very deep	loam	well	Slope, erodible, rock outcrop inclusions
Cuyama River Valley	Panoche	Floodplains and alluvial fans	0-9	very deep	sandy loam	well	Some areas of irrigated cropland
	Stutzville	Low floodplains	0-2	very deep	silty clay loam	somewhat poorly	Some areas of irrigated cropland, salinity
	Metz	Alluvial fans	0-9	very deep	loamy sand	somewhat excessively	Some areas subject to overflow
	Pleasanton	Dissected terraces	2-30	very deep	cobbly sandy loam	well	None
Southwestern Kern County	Unnamed	Mountain uplands (Emigdio Mountains)	NA	NA	NA	NA	Slope
	Arvin	Alluvial fans and stream terraces	5-9	very deep	stony sandy loam	well	Salinity, irrigated cropland, perched water table
	Hesperia	Alluvial fans	0-9	very deep	sandy loam	well	Salinity, irrigated cropland, perched water table

Source: Shipman 1981; Shipman 1972; O'Hare 1984, personal communication; O'Hare et al. 1984; Key 1984, personal communication.

[1]very deep = >60 inches
deep = 40-60 inches
moderately deep = 20-40 inches
shallow = 10-20 inches

NA = Not Available

TABLE 3-9

MAJOR SOIL UNITS ALONG EMIDIO TO BLYTHE ROUTE

Location	Soil Series, Association, land types	Setting	Slope (%)	Depth[1]	Texture	Drainage Class	Major Limiting Factors
West of Tehachapi Mountains	Arvin	Alluvial fans and stream terraces	5-9	very deep	stony sandy loam	well	Salinity, irrigated cropland, perched water table
	Hesperia	Alluvial fans	0-9	very deep	sandy loam	well	Salinity, irrigated cropland, perched water table
Tehachapi Mountains	Walong	Mountainous uplands	15-30	moderately deep	sandy loam	well	None
	Arvin	Alluvial fans and stream terraces	5-9	very deep	stony sandy loam	well	None
	Tehachapi	Old alluvial fans and terraces	2-15	very deep	sandy loam	well	None
	Arujo-Friant-Tunis complex	Mountainous uplands	50-75	shallow to deep	sandy loam, loam	well to somewhat excessively	Slope, depth to rock
	Chanac-badland complex	Old disserted terraces	30-50	very deep	clay loam	well	Slope
Tehachapi Valley	Steuber	Alluvial fans and stream floodplains	5-9	very deep	sandy loam	well	None
	Tujanga	Alluvial fans and floodplains	2-5	very deep	loamy sand	somewhat excessively	None
	Tehachapi	Old alluvial fans and terraces	2-15	very deep	sandy loam	well	None
	Unnamed (Psamments-Xerolls complex)	Recent and old stream bottoms (Water, Blackburn, Mendleburu, Antelope Canyons)	0-2	very deep	coarse surfaces underlain by gravelly coarse to moderately fine	excessively to moderately well	Subject to flooding

TABLE 3-9 (CONTINUED)

Location	Soil Series, Association, land types	Setting	Slope (%)	Depth[1]	Texture	Drainage Class	Major Limiting Factors
Mojave Desert	Garlock	Alluvial fans and terraces	2-9	very deep	loamy sand	well	Coarse-textured surface layer (prone to wind erosion)
	Cajon	Alluvial fans and plains	0-5	very deep	loamy sand	somewhat excessively	Coarse-textured surface layer
	Halloran	River terraces	0-2	very deep	sand, sandy loam	moderately well	Coarse-textured surface layer
	Manet	Recent alluvial fans	0-9	very deep	sand, loamy sand	well	Coarse-textured surface layer
	Rosamond	Low alluvial fans	0-2	very deep	loam, clay loam	well	None
	Bousic	Basin floor and basin rims	0-1	very deep	clay	moderately well	Saline-alkaline and clayey texture surface layer
	Unnamed	Playas	0-1	very deep	variable	variable	Saline-alkaline and clayey texture surface layer, short period flooding after high intensity rainstorms
	Villa, Victorville	Mojave River floodplain and low terraces	0-2	very deep	loamy sand, sandy loam	moderately well	Subject to flooding, irrigated cropland
	Unnamed	Desert pavement on upper older alluvial fans	0-5	moderately deep to deep	silt loam, clay loam	moderately well to well	Subject to high runoff
Palo Verde Valley (near Blythe)	Meloland	Colorado River floodplain	0-1	deep	silty clay loam	well	Perched water table in irrigated croplands
	Rositas, Imperial, Gilman	Colorado River floodplain and valley floor alluvium	0-2	deep	fine sand, silty clay	somewhat excessively to well	None

TABLE 3-9 (CONTINUED)

Location	Soil Series, Association, land types	Setting	Slope (%)	Depth[1]	Texture	Drainage Class	Major Limiting Factors
	Carrizo	Arroyos	0-2	deep	gravelly sand	excessively	Subject to flooding

Source: Valverde and Hill 1981; SCS 1982; Elam 1974; Endo 1984, personal communication.

[1]very deep = >60 inches
deep = 40-60 inches
moderately deep = 20-40 inches
shallow = 10-20 inches

TABLE 3-10

MAJOR SOIL UNITS ALONG BLYTHE TO McCAMEY ROUTE

Location	Soil Series, Association, land types	Setting	Slope (%)	Depth[1]	Texture	Drainage Class	Major Limiting Factors
Southwestern Arizona	Gilman-Antho-Vint	Floodplains and alluvial fans	0-3	deep	loam, sandy loam, loamy fine sand	well	Subject to flooding, some areas of agricultural land
	Gunsight - Rillito - Pinal	Alluvial surfaces and valley plains	0-15	deep to shallow (hardpan)	very gravelly loam, gravelly sandy loam, gravelly loam	well	Slope, depth to rock
	Lomitos-Cherioni-Gachado	Hills and mountains with rock outcrops	2-70	shallow	very cobbly loam, very gravelly sandy loam	well	Slope, depth to rock
	Harqua - Perryville-Gunsight	Old fan surface	0-8	deep	gravelly clay loam, gravelly loam, very gravelly loam	well	None
Southeastern Arizona	House Mountain - Lampshire - Mabray	Hills and mountains with rock outcrop inclusions	9-75	shallow	stony clay loam, very cobbly loam	well	Slope, depth to rock
	Latene - Nickel - Pinaleno	Dissected alluvial fans	1-75	deep	loam, very gravelly sandy loam	well	Slope
	Caralampi-White House	Dissected old alluvial fans	5-30	deep	very gravelly sandy loam, gravelly loam	well	Slope
	Crot	Playas	0-1	deep	sandy loam	poor	Sodic/saline, somewhat poorly drained
New Mexico	Mohave, Stellar	Lower parts of piedmont slopes or plains between desert mountains and broad basin floors	0-5	deep	sandy clay loam, loam, sandy loam, loamy sand	well	None
	Hondale, Mimbres	Basin floors and valley bottoms	0-2	deep	loam, silt loam, silty clay loam	well	Alkalinity

TABLE 3-10 (CONTINUED)

Location	Soil Series, Association, land types	Setting	Slope (%)	Depth[1]	Texture	Drainage Class	Major Limiting Factors
	Cacique, Pintura	Sandy plains dominated by sand dunes and hummocks	0-5	moderately deep to deep	sandy loam, loamy sand, fine sand	well	Coarse-textured surface layer
	Gila, Vinton	Rio Grande River floodplain	0-2	deep	sand to clay (highly stratified)	variable	Subject to flooding, irrigated cropland
Texas	Hueco, Wink, Wichett, Pyote	Valley fills, dune deposits, bedrock areas, and residual soils from sedimentary rocks	0-3	deep	loamy fine sand	well	Coarse-textured surface layer
	Congers, Ratliff, Upton, Reakor	Valley fills, dune deposits, bedrock areas, and residual soils from sedimentary rocks	0-5	deep	gravelly loam, clay loam	well	None
	Holloman-Reeves-Hoban	Salt Basin (west of Guadalupe Mountains)	0-50	deep	sandy silty clay loam, clay loam, silty clay loam	well	Alkalinity
	Gila, Arno	Pecos River floodplain	0-3	deep	clay, silty clay, fine sandy loam	well	Subject to flooding

Source: SCS 1975; Maker et al. 1978; BLM 1976.

[1]very deep = >60 inches
deep = 40-60 inches
moderately deep = 20-40 inches
shallow = 10-20 inches

3.2.3.2 Emidio to Blythe. The major soil units occurring along the proposed pipeline route commonly are very deep, alluvial in origin, and occupy the level to gently sloping landscapes (Table 3-9). The largest concentration of sensitive soil units are found in the Mojave Desert. These soils are typically prone to wind erosion problems as a result of the coarse-textured surface layers. Areas subject to flooding occur in the lower valleys and floodplains (i.e., Tehachapi Valley, Mojave and Colorado Rivers). High salinity areas are scattered throughout the Mojave Desert in the dry lake beds (playas).

3.2.3.3 Blythe to McCamey. The major sensitive soils intersected by this pipeline segment are characterized by high salinity, steep slopes, coarse-textured surface layers, shallow depth to bedrock, and are subject to flooding (Table 3-10). Sensitive soils in Arizona are typically coarse-textured, shallow, and occupy steep slopes. Included are areas subject to flooding (i.e., floodplains) and areas of high salinity (i.e., playas). The sensitive soils along the New Mexico and Texas pipeline segment are alkaline (i.e., Salt Basin), contain coarse-textured surface layers (i.e., sand dunes), prone to wind erosion, and are subject to flooding (i.e., Rio Grande and Pecos Rivers).

3.2.4 Surface Water

The streams crossed by the proposed pipelines are summarized in Tables 3-11 and 3-12. A short summary of relevant characteristics is included for each pipeline segment between Las Flores and McCamey. No above-ground structures are planned in the 100-year floodplain.

3.2.4.1 Las Flores to Emidio. The proposed pipelines would pass through the watersheds of four major streams and rivers between Las Flores and Emidio. The largest flows generally occur on these streams during the winter rainy season between November and April. Base flows are typically only a small fraction of the winter volume and most of the streams do not flow during the summer months. Response to precipitation is flashy and streams generally carry high sediment loads during runoff events (Waanaren and Crippen 1977). None of these streams are used for municipal water supplies at or downstream from the pipeline crossings. Major streams that the proposed pipelines would cross and for which there is potential for significant impacts to surface water resources are as follows:

- Santa Ynez River - The proposed pipelines would cross the Santa Ynez near Buellton. Flows gaged at Coopers Reef 7 miles downstream averaged 27 cubic ft per second (cfs) for 22 years of record through September 1976. The maximum discharge recorded during that period was 81,000 cfs on January 25, 1969. The river is dry for periods in some years. In some areas of the river, the channel is degrading (down cutting). At Solvang a telephone cable crossing the river was originally buried at a depth of 12 ft and when checked 10 years later was found to be buried at a depth of only 6 ft (Kim 1984, personal communication). Scour depths were calculated at 10 ft for the same location. Bed material on the channel surface at the

TABLE 3-11

STREAM CROSSINGS BETWEEN LAS FLORES AND EMIDIO

Stream	Approximate Milepost	Status[1]
Santa Barbara County		
Cañada del Venadito[2]	2	I
Cañada del Refugio[2]	3	P
Tajiguas Creek[2]	5	P
Arroyo Quemado[2]	6	I
Cañada de la Pila[2]	7	I
Cañada de la Huerta[2]	7	I
Arroyo Hondo[2]	7	I
Cañada de la Galina[2]	8	I
Cañada de Guillermo[2]	8	I
Cañada de la Posta[2]	8	I
Cañada del Molino[2]	9	I
Cañada de las Zorrillas[2]	10	I
Cañada San Onofre[2]	10	P
Cañada del Leon[2]	10	I
Cañada Alcatraz	11	I
Cañada del Cementerio	11	I
Cañada del Barro	12	I
Gaviota Creek	12	P
San Antonio Creek[2]	25	I
Zaca Creek	26	I
Santa Ynez River	23	P
Sisquoc River	40	P
La Brea Creek	44	I
North Fork La Brea Creek	44-47	I
Santa Barbara and San Luis Obispo Counties		
Cuyama River	63	P
Kern County		
California Aqueduct	120	NA

Source: ERT

[1]I = Intermittent; P = Perennial; NA = Not Applicable

[2]Not crossed by the Getty Proposal

TABLE 3-12

STREAM CROSSINGS BETWEEN EMIDIO AND MCCAMEY

State	Stream Crossed	Approximate Mile Post	County	Status[1]
Emidio to Blythe:				
California	El Paso Creek	12	Kern	I
	Caparell Creek	15	Kern	I
	Brite Creek	32	Kern	I
	Oak Creek	43	Kern	I
	Los Angeles Aqueduct (underground)	49	Kern	NA
	Mojave River	125	San Bernardino	I
	Colorado River Aqueduct (underground)	253	San Bernardino	NA
Blythe to McCamey:				
	Colorado River	294	LaPaz	P
Arizona	Gila River	406	Maricopa	P
	Gila Bend Canal	406	Maricopa	P
	North Branch Santa Cruz Wash	463	Pinal	I
	Florence-Casa Grande Canal	487	Pinal	I
	San Pedro River	552	Pima	I
	San Simon Creek	631	Cochise	I
	Bass Canyon Creek		Cochise	P
	Wildcat Creek		Cochise	P
New Mexico	Rio Grande River (several draws & drains in Rio Grande area)	786	Doña Ana	P
	West Drain	784	Doña Ana	I
	La Union Canal	784	Doña Ana	I
	Anthony Drain	788	Doña Ana	I
Texas	Eightmile Draw (dry)	883	Hudspeth	I
	Guadalupe Arroyo (dry)	897	Hudspeth	I
	Salt Basin Area	888-894	Hudspeth	I
	Delaware River	910	Culberson	I
		913	Culberson	I
		915	Culberson	I
	Wild Horse Draw	927	Culberson	I
	Castle Draw	934	Culberson	I
	Kimbell Draw	939	Culberson	I
	Salt Creek	954	Reeves	I
	Pecos River	966	Reeves/Loving	P
	Rudd Draw	981	Loving	I
	Monument Draw	1003	Winkler	I

Source: ERT

[1]I = Intermittent; P = Perennial; NA = Not Applicable

proposed pipeline crossing ranges in size from sand to cobbles 12 inches in diameter. The average grain size is estimated to be about 2.5 inches in diameter.

- Sisquoc River - The proposed pipelines would cross the Sisquoc River near the confluence with La Brea Creek. Flows gaged at a station 3 miles upstream averaged 28 cfs in the 33 years of record through September 1976. The maximum discharge recorded was 23,200 cfs on January 6, 1966. There is no flow for several months each year. The channel is degrading in the vicinity of the proposed pipeline crossing. A water supply pipeline on the Sisquoc Ranch was buried 12 ft below the channel in 1963 and as the stream channel degraded, the pipeline was uncovered necessitating reburial in 1982 (Pfeiffer 1984, personal communication). The Sisquoc River in the vicinity of its confluence with La Brea Creek has a wide braided channel. The substrate ranges in size from sand to cobbles as large as 12 inches. The average grain size is estimated to be approximately 3 inches.

- La Brea Creek - The pipelines would follow La Brea Creek north of the Sisquoc River crossing. Flows gaged at the mouth of the La Brea Creek averaged 6.81 cfs for the 30 years of record through September 1973. The maximum discharge recorded was 11,200 cfs on December 6, 1966. The stream is dry for a period in most years. The channel is wide and braided at the mouth of La Brea canyon. The stream meanders across a narrow flood plain within the canyon. Bed material in the canyon ranges in size from sand to cobbles 12 inches in diameter, and bed rock is exposed in the channel in the upper reaches.

- Cuyama River - The proposed pipelines would cross the Cuyama River immediately upstream of the National Forest boundary. Two other crossings are planned in the section further upstream. The nearest point where flows on the Cuyama River were measured is approximately 15 miles downstream of the point the pipelines enter the basin. Flows gaged near Buckhorn Canyon on the Cuyama River averaged 21.6 cfs in the 24 years through September 1981. The maximum discharge recorded was 17,800 cfs on February 25, 1969. There is no flow at times in most years. The channel bed material is sand and gravel up to 1.5 inches in diameter. The average grain size is about 3/8 inch in diameter. Construction activities have disturbed the river both upstream and downstream of the crossings. The channel is unstable and appears to be agrading (filling in) under the present flow regime.

3.2.4.2 <u>Emidio to Blythe</u>. No significant perennial or intermittent streams are crossed in this segment. The Los Angeles Aqueduct and the Colorado River Aqueduct would be crossed. The aqueducts are concrete-lined channels or conduits.

3.2.4.3 <u>Blythe to McCamey</u>. There are five major river drainages between Blythe and McCamey (Table 3-12): the Colorado, Gila, San Pedro, Rio Grande, and Pecos Rivers. The crossings of these rivers are in their lower reaches. The Colorado River, Rio Grande River, and Gila River are regulated perennial rivers. The regulation of rivers by dams and diversions tends to moderate the magnitude of large flow events. The San Pedro and Pecos Rivers are intermittent in the reaches of the proposed pipeline crossings but perennial upstream. Peak flows for the Colorado, Rio Grande, Gila, San Pedro and Pecos Rivers are found in Table 3-13.

3.2.5 Groundwater

Along the 1,200-mile pipeline alignment from Las Flores to McCamey, 25 major groundwater basins have been identified and characterized. Of these, 15 basins representing approximately 400 miles along the alignment have been interpreted to be sensitive to potential effects of the proposed pipeline. Criteria used to determine sensitive areas include:

- Presence of a water table within 100 ft of the ground surface.

- Presence of an aquifer or groundwater basin that provides a sufficient quantity and quality of groundwater for a moderate to high degree of use.

3.2.5.1 Las Flores to Emidio. Principal aquifers along the Las Flores to Emidio pipeline segment consist of consolidated rock aquifers along the Santa Ynez Mountains and coastal areas, and unconsolidated alluvium and marine sediment aquifers along streams and in groundwater basins. These aquifers and groundwater basins have been grouped into six major basins along the pipeline alignment.

- Coastal - contains alluvium of 4 perennial and 14 ephemeral streams and consolidated sediments along the coast and inland across the Santa Ynez Mountains through Gaviota Pass. Consolidated rock aquifers include fracture zones in the Monterey Shale, Vaqueros, Sespe, Alegria, Gaviota, Sacate, and Matilija Formations. These aquifer units have locally high variations in water quality and permeability depending upon recharge, fault, and fracture conditions. Therefore, they are not extensively developed as water supplies.

- Santa Ynez, San Antonio, and Sisquoc - contain alluvium along major streams and underlying basins of thick unconsolidated sediments of the Orcutt, Paso Robles, and Careaga Formations. Groundwater development is high to moderate for irrigation, domestic, and municipal uses.

- Cuyama and San Joaquin - extensively developed for irrigation uses, but locally high dissolved solids concentrations limit their use for domestic and municipal use. The basins are composed of relatively thick alluvial valley fills containing permeable sand and gravels, with locally confined aquifer conditions beneath discontinuous layers of low permeability silt and clay.

TABLE 3-13

MAJOR RIVER FLOW CHARACTERISTICS

BLYTHE TO McCAMEY

River	Maximum Discharge	Minimum Discharge	Average Discharge	Period of Record	Drainage area at the Gage
Colorado River near Blythe, CA	39,900 cfs (August 17, 1983)[1]	1,060 cfs (November 25, 1972)	7,586 cfs	April 1969-Sept. 1980	186,200 sq. miles
Rio Grande River at El Paso, TX	13,500 cfs[2] (September 3, 1925)	No flow at times	501 cfs	1938-Sept. 1981	32,207 sq. miles
Gila River above Diversions at Gillespie Dam, AZ	124,000 cfs (February 17, 1980)	No flow at times[3]	338 cfs	June 1935-Sept. 1981	49,640 sq. miles
San Pedro River near Redington, AZ	28,600 cfs (August 2, 1951)	No flow at times in most years	46.1 cfs	June 1947-Sept. 1980	2,939 sq. miles
Pecos River near Orla, TX	23,700 cfs (September 29, 1941)	No flow at times[4]	169 cfs	May 1937-Sept. 1980	21,210 sq. miles

Source: USGS 1980a-d.

[1]Sampson 1984, personal communication.

[2]This is largest discharge since construction of Elephant Butte Dam.

[3]Most recently July 14, 1967.

[4]Most recently 1965.

The groundwater basin summary for the Las Flores to Emidio segment is presented in Table 3-14, which shows the map location number, approximate length of pipeline route through the basin, minimum depth from the ground surface to the water table, relative degree of groundwater development, and typical total dissolved solids concentrations. Basins that are shown on the table to be sensitive to potential effects of the pipeline were selected because of relatively high vertical permeabilities, depths to water less than 100 ft, and high to moderate groundwater development.

Groundwater also occurs in much smaller quantities in fractured consolidated sedimentary rocks and in unconsolidated terrace and tributary stream alluvium along most of the proposed pipeline alignment. Groundwater development in these areas is limited to a few wells and springs. These few wells have low yields and are used primarily for domestic supplies and livestock watering.

3.2.5.2 Emidio to Blythe. The Emidio to Blythe segment of the proposed pipeline crosses the Mojave Desert Region of California. In this region groundwater may be found at depths of several hundred feet in numerous undrained basins that have accumulated large thicknesses of alluvial fill. Typically, groundwater is closest to the surface near the center of these basins where dry lakes, or playas, may be found. These playa lakes are indicated by the stipple pattern on Map 1-2. Water quality is poorest and permeability of sediments much lower toward the central parts of the groundwater basins in this region.

Depth to groundwater, poor water quality, and sparse development usually limit the sensitivity of groundwater resources along this pipeline segment. Groundwater resources are considerable along two portions of the route. These include that portion of the San Joaquin Valley east of Emidio, and the alluvium of the Mojave River near Barstow.

- San Joaquin - This segment of pipeline crosses the eastern half of the southern San Joaquin Valley. As described for the segment of pipeline west of Emidio, this basin is a thick deposit of valley fill alluvial sediments and is extensively developed primarily for irrigation use. The great depth to water (>100 ft) and presence of confining layers of low permeability (Wood and Dale 1964) limit the sensitivity of this aquifer to potential effects from the proposed pipeline.

- Mojave River - Alluvium of the Mojave River is tapped extensively by wells in the Barstow area for municipal, industrial, and agricultural use. This high degree of development coupled with high vertical permeabilities of alluvium and shallow depth to water indicates high sensitivity to potential effects of the pipeline.

The groundwater basin summary for the Emidio to Blythe segment is presented in Table 3-14.

TABLE 3-14

GROUNDWATER BASIN SUMMARY

Map Code[12]	Groundwater Basin	Length of Pipeline Through Basin (miles)[9,10]	Minimum Depth to Water Table (ft)	Degree of Groundwater Development	Total Dissolved Solids (ppm)
	Las Flores to Emidio				
	Coastal[1]	6	<10-100	low	600-2,000
GW-1	Santa Ynez[2]	3*	<10-30	high	470-1,000
GW-2	San Antonio[3]	4*-8*[11]	<10-100	moderate	400-900
GW-3	Sisquoc[4]	1.5*	<10-30	moderate	628
GW-4	Cuyama[5]	20*	<10-150	high	500-2,100
	San Joaquin[6]	16	300-500[13]	high	681-5,480
	Emidio to Blythe				
	San Joaquin[6]	15	300-500	high	324-1,550
GW-5	Mojave River[7]	12*	<10-50	high	<500-2,000
	Blythe to McCamey[8]				
	Palo Verde	8	<10	low	794-4,550
GW-6	La Posa	10*	<100	moderate	NA
	Ranegras Plain	12	>300	low	800
	Harquahala Plains	14	>200	high	500-800
GW-7	Centennial Area	16*	62-227	moderate	1,000-3,000
	Gila Bend	11	>200	moderate	1,200-1,530
	Waterman Wash	27	>200	moderate	302-876
GW-8	Lower Santa Cruz	71*	44-453	high	373-964
GW-9	San Pedro River	26*	45-215	moderate	243-344
GW-10	Sulphur Springs Valley	12*	26-339	moderate	440-782
GW-11	San Simon	32*	48-395	high	260-289
GW-12	Animas/Lordsburg Valleys	19*	57-275	moderate	279-590
GW-13	Mimbres Valley	15*	60-100	moderate	194-992
GW-14	Rio Grande Valley	14*	<10-480	high	NA

TABLE 3-14 (CONTINUED)

Map Code[12]	Groundwater Basin	Length of Pipeline Through Basin (miles)[9,10]	Minimum Depth to Water Table (ft)	Degree of Groundwater Development	Total Dissolved Solids (ppm)
	Hueco Bolson	6	268-381	moderate	500
	Salt Basin	72	<100	moderate	NA
GW-15	Pecos River Valley	180*	60-85	moderate	800-3,000

Sources: [1]Miller and Rapp 1968; and Dibblee 1950
[2]Wilson 1959; and Upson and Thomasson 1951
[3]Muir 1964; Montgomery 1975
[4]Worts 1951
[5]Upson and Worts 1951
[6]Wood and Dale 1964
[7]Dibblee 1967; Thompson 1929; Hughes 1975
[8]BLM 1976

NOTE: [9]*Indicates sensitive areas. Affected lengths and basins are equal for Getty and Celeron/All American routes within the Las Flores to Emidio segment except where noted.

[10]Lengths of sensitive areas for the Blythe to McCamey segment are probably overestimates because entire basin widths are used where detailed information is not available.

[11]Celeron = 4 miles; Getty = 8 miles.

[12]See Map 1-2.

[13]Depth to groundwater suitable for irrigation.

3.2.5.3 Blythe to McCamey. Groundwater occurs in desert basins and alluvial valleys of major streams along the Blythe to McCamey pipeline segment. Information pertaining to 17 groundwater basins is summarized in Table 3-14. This information was obtained from the Sohio Project EIS (BLM 1976, pages 2-187 to 2-227) which addresses a similar pipeline along the same route as this segment of the proposed pipeline. Based upon the criteria of depth to groundwater and degree of aquifer use, 10 basins are shown to be sensitive to potential effects of the proposed pipeline. Conditions along much of the remainder of this segment include: limited groundwater availability, great depth to water, or poor water quality that frequently limit the potential for significant groundwater development and use.

3.2.6 Aquatic Biology

3.2.6.1 Las Flores to Emidio

Aquatic Communities and Habitat Characteristics. Of 25 proposed stream crossings in the Las Flores to Emidio segment, only 9 represent perennial or larger intermittent streams (Table 3-11). The following information describes aquatic communities and habitat characteristics in those streams that contain fish species considered to be important as game fish; coastal native; or species of sensitive, threatened, or endangered status.

Coastal Streams. Four perennial coastal streams (Refugio, Tajiguas, San Onofre, and Gaviota Creeks) would be crossed between Las Flores and Gaviota. As typical of most Pacific coastal drainages in California, fish diversity in these streams is low (Moyle 1976) with only a few non-game species present, such as mosquitofish, prickly sculpin, and threespine stickleback (partially armored form, not endangered) (Table 3-15). Other introduced species include rainbow trout, green sunfish, and arroyo chub. Of the four streams, Gaviota Creek and Refugio Creek contain the largest number of fish species with six and three, respectively (Wells and Diana 1975; Dames and Moore 1982; Sasaki 1984, personal communication). Important fish species include rainbow trout in both creeks and the native non-game fish species: prickly sculpin, threespine stickleback, and tidewater goby in Gaviota Creek. The rainbow trout population in both creeks is comprised primarily of resident forms, however, steelhead trout (anadromous) occasionally enter both creeks to spawn (Dames and Moore 1982; Sasaki 1984, personal communication). No known spawning areas for steelhead trout have been documented in these creeks (Sasaki 1984, personal communication). Probable spawning areas for rainbow trout are in the headwater sections of Refugio Creek and at least one mile upstream from the mouth in Gaviota Creek (Sasaki 1984, personal communication). Surveys conducted in San Onofre Creek resulted in no fish (SAI et al. 1983), while prickly sculpin and rainbow trout occur in the upper sections of Tajiquas Creek (Sasaki 1984, personal communication). Habitat requirements and life history information are summarized for the important species previously mentioned (Appendix B, Table B-2).

Habitat surveys conducted in February 1984 revealed that Refugio and Gaviota Creeks exhibit low to moderately good fish habitat at areas

TABLE 3-15

FISH SPECIES POTENTIALLY OCCURRING IN PERENNIAL OR LARGE INTERMITTENT STREAMS

LAS FLORES TO EMIDIO

Common Name	Status[1]	Refugio Creek	Tajiguas Creek	Gaviota Creek	Santa Ynez River	Sisquoc River	La Brea Creek	Cuyama River	California Aqueduct
Arroyo chub	NG	X		X	X	X	X	X	
Black bullhead	G								X
Black crappie	G				X				
Bluegill	G				X				
Brown bullhead	G								X
California roach	NG							X	X
Carp	NG								X
Channel catfish	G				X				X
Fathead minnow	NG				X				
Green sunfish	G			X	X				
Hardhead	NG								X
Hitch	NG								X
Largemouth bass	G				X				
Mosquitofish	NG	X		X					
Pacific lamprey	NG								X
Pond smelt	NG								X
Prickly sculpin	NNG		X	X					
Rainbow trout	G	X	X	X	X	X	X		
Redear sunfish	G				X				
Smallmouth bass	G				X				
Speckled dace	NG					X	X	X	
Splittail	NG								X
Starry flounder	G								X
Striped bass	G								X
Threadfin shad	NG				X				X
Threespine stickleback[2]	NNG			X	X	X	X		X
Tidewater goby	E(C), NNG			X					
White catfish	G								X
White crappie	G				X				X
Yellow bullhead	G								X

Sources: Greenfield and Deckert (1973); Wells and Diana (1975); Dames and Moore (1982); SAI et al., (1983); Marshall (1984); Sasaki (1984); Smith (1984); and Swift (1984).

[1]Status: G = Game fish; NG = Non-game fish; NNG = Native non-game fish; E(C) = Endangered candidate species on federal and California lists.

[2]Partially armored form (not endangered).

below the proposed crossings. Gaviota Creek is one of the larger coastal streams in the area with a mean width of 11 ft and mean depths of 0.3 ft in riffles and 0.9 ft in pools. The lower section of the creek is characterized by long, shallow pools (pool/riffle ratio of 17.1) with bottom substrates dominated by sand and fine gravel. Small amounts of cover are provided by undercut banks, overhanging willows, and dense growths of filamentous algae. Refugio Creek is similar in size with a mean width of 11 ft and mean depths of 0.4 ft in riffles and 0.9 ft in pools. Predominate substrate in the riffles consists of gravel and cobble; while silt, gravel, and cobble dominate the pools. Although there is a good mixture of pools and riffles as indicated by a pool/riffle ratio of 1.1, minimal amounts of cover in the form of substrate and attached algae exist in pools.

Nearshore Marine Coastal Environments. The intertidal area between the mouths of Refugio Creek and Gaviota Creek is composed mostly of sand with some rocky sandstone outcrops and boulders (SAI et al. 1983). Historically, kelp beds have been common in the area at depths ranging from about 12 to 48 ft. (Dames and Moore 1983); however, the "El Niño" episode of 1983 decimated the entire kelp canopy. It is expected that the kelp will become reestablished in about two years (Wolfe 1984, personal communication). Common intertidal and nearshore fishes in the area include sharks, silversides, rockfishes, sculpins, kelp bass, croakers, California halibut, gobies, sanddab, and surfperches (SAI et al. 1983). Other common marine biota in the nearshore area include starfish, sea anemones, mussels, bristle worms, soft corals, mollusks, crustaceans, and sea urchins. Of these groups, commercially important invertebrates include lobsters, crabs, abalone, and red sea urchins. Based on studies conducted in the nearshore area near Gaviota, numbers of commercially important invertebrates are low (MBC and CDF&G 1982). Shorebirds such as avocets, marbled godwits, sandpipers, plovers, oyster catchers, turnstones, gulls, and terns also inhabit the nearshore coastal areas. The coastal lagoon at Gaviota Creek also is used by loons, ducks, grebes, and resident bird species (SAI et al. 1983). The only marine mammals that occasionally occur in the nearshore area include harbor seal and California sea lion.

Santa Ynez River. Fisheries in the Santa Ynez River downstream of Buellton are comprised primarily of non-game species such as arroyo chub, threespine stickleback (not endangered), and mosquitofish (Wells and Diana 1975; Sasaki 1984, personal communication). However, during high water periods game fish species such as rainbow trout, channel catfish, crappies, and sunfishes are often washed downstream from Lake Cachuma and upper sections of the river (Table 3-15) (Sasaki 1984, personal communication). In most instances, low numbers of these fish persist in the lower section of the river during low water periods. Steelhead trout also occasionally enter the lower sections of the Santa Ynez River to spawn during the years with high stream flows (Sasaki 1984, personal communication).

Fish habitat quality in the Santa Ynez River near Buellton is rated as low for game fish species. Based on a habitat survey in February 1984, stream widths ranged from about 30 to 45 ft, while mean depths were 0.5 ft in riffles and 1.1 ft in pools. Pools were relatively long compared to riffles (1:7 ratio) with minimal amounts of cover provided by attached filamentous algae and undercut banks. Substrates were comprised mainly of sand and gravel in the pools and gravel and cobble in the riffles. Based on the lack of suitable sized substrate, game fish probably do not spawn in this section of the Santa Ynez River. Most of the spawning probably occurs upstream of the proposed crossing (Sasaki 1984, personal communication).

Sisquoc River. Fish communities in the Sisquoc River below the La Brea Creek confluence are comprised mainly of non-game species: arroyo chub, speckled dace, and threespine stickleback (not endangered) (Sasaki 1984, personal communication). Rainbow trout occasionally are found in this section of the river during high water periods. Since this section of the Sisquoc River usually dries up during low water periods, the habitat value for rainbow trout is low. The only abundant type of cover available for fish is provided by cobble substrates.

La Brea Creek. Fisheries in La Brea Creek, a relatively large intermittent stream, is similar to the Sisquoc River (Table 3-15) (G. Smith 1984, personal communication). Rainbow trout occasionally enter the stream from the Sisquoc River during high water periods. The only species that persist in the deeper pools during low water periods are arroyo chub, speckled dace, and threespine stickleback (not endangered). Habitat quality for rainbow trout in La Brea Creek is poor.

Cuyama River. Fish species potentially occurring in the Cuyama River include arroyo chub, California roach, and speckled dace (Greenfield and Deckert 1973; Sasaki 1984, personal communication). Habitat quality in the Cuyama River is quite poor because of the lack of well developed pools, minimal cover, and extensive sedimentation that has resulted from sand and gravel dredging activities.

California Aqueduct. Fisheries in the California Aqueduct are quite diverse (Table 3-15). Based on surveys during dewatering activities to repair the aqueduct, predominant game fish species include channel catfish, striped bass, and white catfish (Marshall 1984, personal communication). Recreational fishing occurs along the California Aqueduct but pressure is considered to be low because of limited access.

Threatened and Endangered Species. The tidewater goby (*Encyclogobius newberryi*), a candidate species for Federal listing as an endangered fish (Lorentzen 1984, personal communication), occurs in the coastal lagoon at the mouth of Gaviota Creek (Swift 1984, personal communication). Although most of the population resides in the lagoon, some individuals may move into the lower 0.25-mile section of the creek. This species spends its entire life in the lagoon where it developed. Based on population studies in several lagoons, the number of fish in the Gaviota Creek lagoon is estimated to range from about 100 in the winter to 2,000 in the summer (Swift 1984, personal communication). Additional information on the habitat requirements and life history of this species is presented in Appendix B, Table B-2.

3.2.6.2 Emidio to Blythe

Aquatic Communities and Habitat Characteristics. Perennial or large intermittent streams and aqueducts that would be crossed in the Emidio to Blythe segment include the Mojave River and Colorado River (Table 3-12). The Mojave River near Barstow is intermittent with water present only after rains. Temporary inhabitants after rains may include sunfishes, arroyo chub, largemouth bass, mosquitofish, threespine stickleback, and white crappie (Table 3-16) (Brown 1978).

The proposed crossing of the Colorado River near Blythe is in the Palo Verde Division. Of 17 fish species potentially occurring in this division (Table 3-16), the most abundant game fish species include channel catfish, flathead catfish, largemouth bass, and bluegill (Minckley 1979; Ulmer 1984, personal communication). Habitat preference and life history information are summarized in Appendix B, Table B-2. Aquatic habitat in the Palo Verde Division (Bureau of Reclamation management unit) consists primarily of flowing channel with a few backwater areas (Minckley 1979). Bottom substrates in the mainstem are comprised mainly of sand with lesser amounts of gravel and cobble. As a result of bottom instability, benthic macroinvertebrate and macrophyte communities exhibit low standing crops and diversity (Minckley 1979).

Threatened and Endangered Species. The razorback sucker (*Xyrauchen texanus*), listed as endangered by California and rare by Arizona, occurs in the Colorado River below Blythe. This species could potentially be found in low numbers throughout the Palo Verde Division (Ulmer 1984, personal communication). Habitat preference and life history information is presented in Appendix B, Table B-2.

3.2.6.3 Blythe to McCamey

Aquatic Communities and Habitat Characteristics. Only 6 of the 25 proposed stream crossings in the Blythe to McCamey segment represent perennial or larger intermittent streams (Table 3-12). A total of 46 fish species potentially occur in 3 of these streams, including 12 game fish species (Table 3-17). The following discussion describes existing aquatic communities and habitat characteristics for the major stream crossings that contain important game fish or fish species of threatened or endangered status.

Arizona. Of the seven proposed stream crossings in Arizona (Table 3-12) the largest perennial stream is the Gila River. Although the river is occasionally dry at the proposed crossing, 16 fish species occur or potentially occur in the Gila River including 3 game fish species (Table 3-17) (Minckley 1973; Williams Brothers Environmental Services 1976). The Gila Bend Canal potentially contains the same fish species that occur in the Gila River. Habitat preference and life history information are summarized for important game fish species in Appendix B, Table B-2.

Two perennial streams (Bass Canyon and Wildcat Canyon Creeks) would be crossed by the pipeline in Muleshoe Ranch Preserve; another perennial stream (Hot Springs Canyon Creek) is located immediately downstream of

TABLE 3-16
FISH SPECIES POTENTIALLY OCCURRING IN PERENNIAL
OR LARGE INTERMITTENT STREAMS
EMIDIO TO BLYTHE

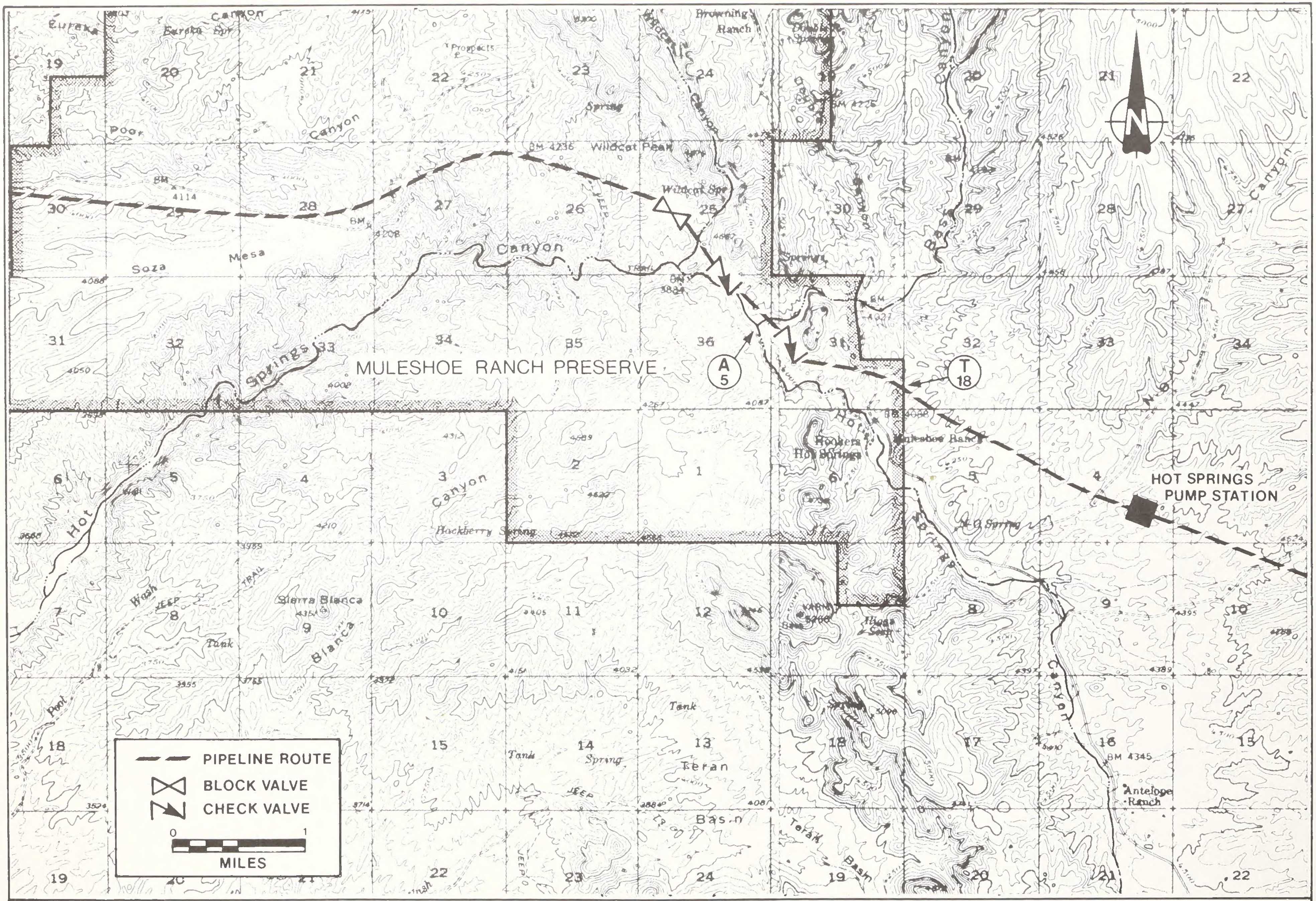
Common Name	Status[1]	Mojave River	Colorado River
Arroyo chub	NG	X	
Black bullhead	G	X	
Black crappie	G		X
Bluegill	G	X	X
Carp	NG		X
Channel catfish	G		X
Green sunfish	G	X	X
Flathead catfish	G		X
Largemouth bass	G	X	X
Mosquitofish	NG	X	X
Razorback sucker	E		X
Redear sunfish	G	X	X
Red shiner	NG		X
Sailfin molly	NG		X
Striped bass	G		X
Striped mullet	NG		X
Threadfin shad	NG		X
White crappie	G	X	
Yellow bullhead	G		X
Zill's tilapia	NG		X

Sources: Brown (1978); Minckley (1979); and Ulmer (1984).

[1]Status: G = Game fish; NG = Non-game fish; E = Endangered on California and Arizona lists.

the Bass Canyon crossing (see Map 3-2). Hot Springs Canyon and Bass Canyon Creeks potentially contain five native fish species: Gila chub, longfin dace, speckled dace, desert sucker, and Sonora sucker (Arizona Natural Heritage Program 1983; Brooks 1984, personal communication) (Table 3-17). The only species occurring in Wildcat Canyon Creek is longfin dace. The primary importance of the stream sections below the crossings is spawning and rearing areas for young fish. Similarly, Gila chub, a state threatened species, uses the lower section of Bass Canyon Creek for spawning and rearing in the spring and summer (Brooks 1984, personal communication). Adult Gila chub are found mainly in Bass Canyon Creek above the proposed crossing after spawning.

The Florence-Casa Grande Canal is primarily an irrigation canal that contains introduced warm-water fish species (i.e., bass, catfish, bluegill, and shad) (Weaver 1984, personal communication). Also, the possibility exists that three native fish occur in this canal: the Gila sucker, Gila mountain sucker, and Gila topminnow. The Canal is not managed as a recreational fishery.



MAP 3-2 PROPOSED PIPELINE CROSSING OF THE MULESHOE RANCH PRESERVE

TABLE 3-17

FISH SPECIES OCCURRING OR POTENTIALLY OCCURRING IN PERENNIAL OR LARGE INTERMITTENT STREAMS

BLYTHE TO McCAMEY

		Arizona				New Mexico	Texas
Common Name	Status[1]	Bass Canyon Creek[2]	Hot Springs Canyon Creek[2]	Wildcat Canyon Creek[2]	Gila R.	Rio Grande R.	Pecos R.
Big scale logperch	NG						X
Black buffalo	NG						X
Black bullhead	GF					X	X
Black crappie	GF					X	
Bluegill	GF					X	X
Bullhead minnow	NG					X	
Carp	NG				X	X	X
Channel catfish	GF				X	X	X
Desert sucker	NG	X	X		X		
Eastern silvery minnow	NG				X		X
Fathead minnow	NG				X		X
Flathead catfish	GF					X	X
Gila chub	T/AZ	X	X				
Gizzard shad	NG					X	X
Goldfish	NG						X
Green sunfish	GF				X	X	X
Greenthroat darter	NG						X
Largemouth bass	GF				X	X	X
Loach minnow	NG				X		
Longear sunfish	NG					X	X
Longfin dace	NG	X	X	X	X		
Longnose dace	NG					X	
Longnose gar	GF						X
Mexican tetra	T&E/NM					X	X
Mississippi silvery minnow	NG					X	X
Mosquitofish	NG				X	X	X
Mozambique mouthbrooder	NG				X		
Pecos River pupfish	NG						X

TABLE 3-17 (CONTINUED)

Common Name	Status[1]	Arizona: Bass Canyon Creek[2]	Arizona: Hot Springs Canyon Creek[2]	Arizona: Wildcat Canyon Creek[2]	Arizona: Gila R.	New Mexico: Rio Grande R.	Texas: Pecos R.
Proserpine shiner	NG						X
Rainbow trout	GF					X	
Rainwater killifish	NG					X	X
Red shiner	NG				X	X	X
Rio Grande killifish	NG						X
Rio Grande shiner	NG					X	
River carpsucker	NG					X	X
Sailfin molly	NG				X		
Smallmouth buffalo	NG					X	X
Sonora sucker	NG	X	X		X		
Speckled chub	NG					X	
Speckled dace	NG	X	X				
Spikedace	NG				X		
Threadfin shad	NG				X		X
Tidewater silverside	NG						X
White bass	GF						X
White crappie	GF					X	X
Yellow perch	GF					X	

Sources: Minckley (1973); Williams Brothers Environmental Services (1976); Lee et al. (1980); Arizona Natural Heritage Program (1983); Personal communication: Brooks (1984); Patterson (1984); and Weaver (1984).

[1]Status: GF = Game fish; NG = Non-game fish; T&E/NM = Endangered in New Mexico; T/AZ = Threatened in Arizona.

[2]Located in Muleshoe Ranch Preserve.

The Arizona Aqueduct, presently under construction, may contain many of the same fish species that occur in the Colorado, Salt, and Verde Rivers (Weaver 1984, personal communication).

The San Pedro River is intermittent at the proposed crossing. The longfin dace is the most abundant species when sufficient water is present (Weaver 1984, personal communication). Also, the three native fish species noted above might occur, but the habitat is not adequate to support stable populations. This river is not managed as a recreational fishery.

No fish are known to inhabit the San Simon River in the vicinity of the proposed crossing. The channel is normally dry, but is subject to flash floods.

New Mexico. The Rio Grande River would be crossed south of Las Cruces, New Mexico. This segment of the Rio Grande River is dry during the winter because of irrigation diversions and turbidity levels are high when the river is flowing, but a fishery does exist (Patterson 1984, personal communication). A total of 24 fish species could potentially occur in the Rio Grande River near the stream crossing; 10 of these species are considered game fish (Table 3-17) (Lee et al. 1980). Habitat requirements and life history information are presented for the most important game fish species in Appendix B, Table B-2. Limited information is available on the aquatic resources in the other intermittent streams crossed in New Mexico.

Texas. The Pecos River is the only perennial stream crossed in Texas (Simmons 1984, personal communication). Of the 30 fish species potentially occurring in the vicinity of this stream crossing, white bass is the only abundant game fish (Table 3-17) (Lee et al. 1980; Williams Brothers Environmental Services 1976). The habitat in this river segment is characterized by turbid saline pools of extreme fluctuations with moderately dense aquatic vegetation (Campbell 1958; Davis 1980). Fishery surveys conducted in 1968 concluded that the Pecos River above Farm Road 1776 to the Red Bluff Dam is suitable for game fish when irrigation releases maintain good water quality (Henderson 1968). When the Red Bluff Reservoir water quality degrades because of drought, the river water quality also deteriorates.

In Texas, several streams, Buckhorn Draw, Rudd Draw, and Monahans Draw, may contain pools with water year round that provide refuge for some fish species (Simmons 1984, personal communication).

Threatened and Endangered Species. One federally listed endangered species, the Gila topminnow (*Poeciliopsis occidentialis occidentalis*), may occur in the Florence-Casa Grande Canal in Arizona when the canal is full (Weaver 1984, personal communication). However, the canal and crossing are not considered critical habitat for this topminnow.

The Gila chub (*Gila intermedia*) is no longer being considered as a Category 1 species by the U.S. Fish and Wildlife Service (FWS) because it is more widespread than originally expected (Johnson 1984, personal communication). However, the Gila chub is listed as a Group 3 threatened species by the Arizona Game and Fish Department, indicating that its continued presence in Arizona could be in jeopardy in the foreseeable future (Arizona Game and Fish Commission 1982). The Celeron/All American pipeline would cross Bass Canyon Creek in the Muleshoe Ranch Preserve, which is considered critical habitat for Gila chub (Weaver 1984, personal communication). A recent flood event that occurred at the Muleshoe Ranch Preserve in October 1983 may have impacted the Gila chub population (Bill 1984, personal communication).

The Mexican tetra (Astyanax mexicanus) is listed by the New Mexico Department of Game and Fish (1983) as endangered, Group 2, which means that prospects of survival or recruitment in New Mexico are likely to be in jeopardy within the foreseeable future. The geographic range of the Mexican tetra includes the Rio Grande Valley in New Mexico where only 20 to 40 known populations occur. One specimen was collected in Anthony Drain in 1944 (New Mexico Natural Heritage Data Base 1984). Habitat requirements and life history information are summarized for all species discussed above in Appendix B, Table B-2.

No threatened, endangered, or special concern fish species listed by the State of Texas occur in the vicinity of the pipeline (Travis 1984, personal communication).

3.2.7 Terrestrial Biology

The Celeron/All American and Getty pipelines would traverse 6 major natural vegetative cover types along the proposed 1,200-mile route between Las Flores, California and McCamey, Texas. Vegetative "cover types" are plant communities that can be discerned based on their growth form and structure. These cover types include coastal sage scrub, chaparral, grassland, oak woodland, riparian woodland, and desert scrubland. Vegetative cover types were delineated on a regional basis using literature, aerial photographs, and limited field reconnaissance. Plant communities (assemblages of plant populations living in a prescribed area or habitat) described in this chapter consist of the major plant associations characteristic of the area. Within each cover type several distinct plant associations can be recognized based on microclimatic conditions including rainfall, topographic relief, aspect, slope, soils, and current land use practices. Plant associations are communities with definitive floristic composition. Plant associations can be readily identified in the field and are often named for the plant species, which by virtue of size, numbers, or activity exert a major controlling influence on the community. These species are referred to as dominants. The use of the term "biotic community" is often used and reflects the increased emphasis of developing vegetation classifications that relate vegetation to wildlife habitat factors and associated wildlife species. Appendix Table B-5 describes the major cover types, plant communities and characteristic plant and wildlife species along the proposed Getty and Celeron/All American pipeline routes. This table is based to a great extent on the biotic communities described by Brown (1982) and Section 2A.6 in Volume 2 of Williams Brothers (1976) technical report for the Sohio EIS.

Within this section, separate discussions for vegetation, wildlife, rare, threatened and endangered species, and unique or sensitive communities are included for each of the pipeline segments. This discussion is based primarily on existing information, especially for the segment from Blythe to McCamey. Much of the entire route was evaluated for the Sohio Project (BLM 1976). Aerial reconnaissance and field investigations confirmed the presence or likelihood of threatened and/or endangered species or sensitive communities occurring on the route. Interviews with regional experts and review of pertinent literature were used to supplement field studies. A list of threatened or endangered species that may occur along the proposed route was provided by the Fish and Wildlife Service (FWS). Pursuant to Section 7 of the Endangered Species Act, the BLM is conducting informal consultation with FWS concerning protected species. The FWS Biological Opinion regarding potential effects on federally protected species will be included in the FEIS. Information on the Section 7 consultation process is included in Appendix B.

Sensitive species and sensitive communities discussed in this section include those of interest to Federal, state, or local agencies. These include riparian zone vegetation, live oaks, rare cactus, ironwood washes, and dune communities. Map 1-2 illustrates sensitive areas occurring along the various routes. Riparian woodlands or scrublands would be by the pipeline along major drainages. Large man-made wetlands (primarily salt cedar and willow) occur 1,500 ft downstream of the proposed Colorado River crossing and 20 miles downstream in Cibola and Imperial NWRs. Wetlands (as defined by the Army Corps of Engineers or the FWS) do not occur on the route. A list of scientific names for species discussed in this section is included in Appendix B. Agricultural crops are discussed in Land Use, Section 3.2.9.

3.2.7.1 Las Flores to Emidio

Vegetation. The Getty and Celeron/All American pipeline routes in this segment cross the Transverse Range and the coastal Sierra Madre Mountains. Elevations range from near sea level to about 4,000 ft on Miranda Pine Mountain within the Los Padres National Forest (LPNF). The pipeline routes in this segment cross primarily grassland (27 and 33 percent, respectively), desert scrubland (23 and 22 percent), and irrigated agriculture land (18 and 17 percent). Sensitive plant communities in this segment include oak (11 and 9 percent) and riparian woodlands (9 and 1 percent) (Table 3-18).

At lower elevations, gentle foothills are covered by grassland communities. Historically these grasslands were dominated by perennial bunch grasses which were replaced by man-introduced annual species (Ornduff 1974). Extensive grassland areas are fairly rare along the coast as a result of urban and avocado grove expansion (Lehman 1982). Studies of coastal grasslands and grasslands in the Cuyama Valley along the Getty pipeline route reported 75 plant species (WESTEC 1983). Common species included wild oats, downey chess, red brome, red stem filaree and several mustards. The Cuyama Valley grasslands had more forbes including primrose and lupine. Grass pastures are common along stream bottoms and hillsides associated with ranching operations. About 30 percent of this pipeline segment crosses grassland (Table 3-18).

TABLE 3-18

VEGETATION COVER TYPES AFFECTED BY THE PROPOSED PIPELINES

LAS FLORES TO EMIDIO

(In Percent with Miles in Parentheses)

Applicant/County	Chaparral	Coastal Sage	Irrigated Agriculture	Dryland Agriculture	Desert Scrubland[1]	Grassland	Riparian	Woodland[2]	Disturbed	Total (miles)
Celeron/All American										
Santa Barbara	20(12.4)	<1(0.3)	5(3.0)	0	0	47(29.8)	8(5.0)	18(11.4)	2(1.6)	63.5
San Luis Obispo	0	0	12(3.9)	3(0.9)	77(24.2)	4(1.1)	<1(0.1)	0	4(1.3)	31.5
Kern	0	0	50(13.0)	0	8(2.2)	34(9.2)	0	0	8(2.1)	26.5
										121.5
Getty										
Santa Barbara	15(8.8)	1(0.7)	8(4.3)	0	0	37(20.9)	10(5.4)	26(14.5)	3(1.9)	56.5
San Luis Obispo	0	0	12(3.8)	3(0.9)	77(23.7)	3(1.1)	<1(0.1)	0	4(1.3)	30.9
Kern	0	0	50(12.9)	0	8(2.1)	34(8.7)	0	0	8(1.9)	25.6
										113.0

Source: ERT

[1]Includes alkaline scrubland.

[2]Primarily oak woodland.

Coastal sage scrub or "soft chapparal"occurs on upper valleys, south-facing slopes, and dry coastal slopes where marine air penetrates inland. The coastal sage scrub is climax on drier sites and successional to chapparal and oak woodland communities on mesic sites. Dominant species include California sagebrush, purple sage, white sage, coyote brush, California buckwheat, and bush sunflower (Lehman 1982). Less than 1 percent of this pipeline segment crosses coastal sage scrub (Table 3-18).

The chaparral community occurs on steep slopes between 300 and 4,000 ft in elevation. Dominant species include chamise, ceanothus, manzanita, scrub oak, and red berry. The understory is generally poorly developed. Much of the chapparal in the LPNF is 30 years or older; fire suppression has also limited development of herbaceous growth (Forest Service 1983a). A total of 30 species were found in chaparral communities along Getty's proposed route (WESTEC 1983). About 10 percent of this pipeline segment crosses chaparral (Table 3-18).

Oak woodland communities occur at elevations between 600 and 4,000 ft in canyons and on north-facing slopes. Dominant species include coast live oak, canyon live oak, valley oak, and blue oak (WESTEC 1983). Oak woodlands vary from dense stands with well-shaded understories to open savannas associated with annual grasslands. Oak woodlands are generally considered sensitive to disturbance in Santa Barbara County and valley oaks are protected in Kern County. The Forest Service also considers oak woodlands sensitive because of their poor regeneration success in grazed areas. About 11 percent of this pipeline segment crosses oak woodlands (Table 3-18).

Near Miranda Pine Mountain blue oak are associated with a small stand of Coulter pine (Smith, G. 1984, personal communication). The Celeron/All American and Getty proposals would follow a fuel break through this area. The fuel break is dominated by annual grasses and forbs.

The most common community type crossed by the proposed routes is desert scrubland. Desert scrubland or "alkali scrub" occurs in the Cuyama Valley between 1,500 and 2,800 ft elevation. Dominant species include wing scale, cattle spinach, and quail bush. In low-lying areas and along parts of the floodplain of the Cuyama River, arrowweed, iodine bush and alkala blite are common elements. A total of 49 species were found in the alkali scrub community along Getty's proposed route (WESTEC 1983).

Riparian communities along this pipeline segment are limited primarily to the smaller coastal streams including Cañada del Refugio, Arroyo Hondo, Zaca Creek, and Cañada de las Alisos. Riparian vegetation is also well developed along La Brea Creek and Tepusquet Creek. Major riparian zone species include live oaks, western sycamore, white alder, Fremont cottonwood, black cottonwood, various willows, and mule fat. Where the pipeline would cross the Sisquoc and Santa Ynez Rovers, riparian vegetation is severely limited by channel scouring.

The Cuyama River riparian zone is comprised of narrow sporadic bands of Fremont cottonwood; at the crossing no trees are present. In low-lying areas and along parts of the floodplain, arrowweed, iodine bush, and alkali blight are common (WESTEC 1983).

Wildlife. The varying plant communities, presence of water, varying topography, and remote nature of this pipeline segment provide habitat for a diversity of wildlife. Some 307 species of birds, 70 mammals, 34 reptiles, and 14 amphibians have been reported for the LPNF (Freel 1982). Many of these species occur along the ROW, the majority of these species are nongame wildlife. Game animals consist primarily of deer, bobcat, black bear, quail, and band-tailed pigeons. Some limited hunting for gray squirrel, brush rabbits, and Merriam's turkey also occurs within the Santa Lucia Ranger District.

Common wildlife occurring in coastal chaparral and sage scrub communities include Columbian black-tailed deer, gray fox, bobcat, black bear, brush rabbit, California mouse, Merriam's chipmunk, nimble kangaroo rat, dusky-footed wood rat, San Diego pocket mouse, quail, sage sparrow, scrub jay, rufous-sided towhee, wren tit, and a variety of lizards and snakes (Pase and Brown 1982; G. Smith 1984, personal communication).

Oak woodland habitats support similar wildlife species as chaparral as well as habitats for band-tailed pigeon, acorn woodpecker, western flycatcher, ruby-crowned kinglet, screech owl, spotted owl, gray squirrel, feral pigs, and introduced turkeys (Lehman 1982; Freel 1982).

Riparian habitats, like those along La Brea and Zaca Creeks, provide habitat for the widest variety of wildlife and have historically been diminishing in southern California, especially in Santa Barbara County (Lehman 1982). Riparian woodlands can provide nesting habitat for the now rare least Bell's vireo and other rare species like Cooper's hawk, Swainson's thrush, and yellow-breasted chat (Lehman 1982). One audio observation of the least Bell's vireo, a Forest Service sensitive species was reported in La Brea Canyon in 1979 by Dr. Mike Hansen of California Polytechnic University. Nesting surveys were conducted by the Forest Service in May of 1984, no vireos were observed (G. Smith 1984, personal communication).

The saltbush or shadscale scrub vegetation in the Cuyama Valley supports wildlife populations characteristic of desert scrub and agricultural habitats including northern harrier hawks, logger-head shrikes, red-tailed hawks, black-tailed jackrabbits, antelope ground squirrels, Beechey ground squirrels, coyotes, various pocket mice, and kangaroo rats.

Threatened, Endangered, and Special Status Species and Communities. At least 33 special status plant species that are listed by the Fish and Wildlife Service, the California Native Plant Society, the California State Department of Fish and Game, or Kern County may occur along the applicants' proposed routes (Appendix B, Table B-6). Species occurrence as discussed below is based on the proximity of known populations to the proposed pipeline route and similarity of habitat types.

Of these species, six have been found along the proposed pipeline route from Gaviota to Emidio (WESTEC 1983). The black-flowered fig-wort was tentatively identified on the site of the proposed Getty coastal facility at Gaviota. Field surveys for the Getty pipeline application made in the spring of 1983 found Hoffman's nightshade, Catalina mariposa lily and Refugio manzanita on the proposed route. Parish's sidalcea and Lompoc yerba santa were found near the proposed route. Parish's sidalcea is listed as rare on the California Department of Fish and Game list. Live oak trees, protected by Santa Barbara County, and extensive riparian communities occur in La Brea Canyon.

Native perennial grasslands, scrublands, oak woodlands, and riparian areas not affected by grazing, agriculture, or other human activities provide habitats for several rare animal species once widely distributed in southern California. Species such as the California condor, (federally listed endangered) spotted owl (FS sensitive species), golden eagle (BLM sensitive species), and prairie falcon (state listed) occur on Forest lands near the applicants' proposed routes. The San Joaquin kit fox (federally listed endangered), San Joaquin antelope ground squirrel (state listed rare), blunt-nosed leopard lizard (federally listed endangered), and black-shouldered kite occur along portions of the route across the Cuyama Valley. Blunt-nosed leopard lizards and San Joaquin kit fox have been captured or observed near the San Luis Obispo-Kern County line and may occur in suitable habitat throughout the Cuyama Valley and in southwestern Kern County. The pipelines would cross portions of California condor essential habitat. California condors forage in the area of Klipstein Road near milepost 100 and on the Tejon Ranch in the Tehachapi Mountains. Information on other threatened, endangered, or rare species of interest to Federal, state, and local agencies with ranges or habitats in the vicinity of the pipelines is presented in Appendix B, Table B-6.

3.2.7.2 Emidio to Blythe

Vegetation. Between Emidio and Blythe, California the pipeline follows existing railroads, pipelines, and highways across the Mojave and Sonoran Deserts. Across the Mojave and Sonoran Deserts perennial species are limited to desert shrubs; winter rains induce growth of abundant but short-lived flowering annuals.

Near Barstow the pipeline crosses a small band of shadscale scurb community; common species in this community include saltbush, hop sage, winterfat, and bud sagebrush (Williams Brothers 1976; ACT 1980). With the exception of irrigated farmland in the lower San Joaquin Valley and the digger pine and juniper woodlands in the Tehachapi Mountains, the route crosses primarily desert scrubland communities (72 percent) dominated by creosote bush, bur sage, and brittle bush. Other cover types crossed by the Celeron/All American route include desert grassland (11 percent), irrigated agriculture (10 percent), disturbed areas (5 percent), and woodland communities (1 percent) in this 294-mile segment (Table 3-19).

TABLE 3-19

VEGETATION COVER TYPES AFFECTED BY THE CELERON/ALL AMERICAN PIPELINE

(Shown in Percent with Miles in Parentheses)

State/County	Irrigated Agriculture	Dryland Agriculture	Desert Scrubland[1]	Desert Grassland	Riparian	Woodland	Disturbed[2]	Total (linear miles)
EMIDIO TO BLYTHE								(294.0)
California								
Kern	22(18.3)	2(1.7)	35(29.2)	31(25.3)	<1(0.2)	4(3.7)	6(4.7)	83.1
San Bernardino	2(3.3)	0	89[3](153.4)	4(6.5)	<1(0.5)	0	5(8.1)	171.8
Riverside	19(7.4)	0	77(30.0)	0	<1(0.1)	0	4(1.6)	39.1
BLYTHE TO McCAMEY								(790.3)
Arizona								
La Paz	<1(0.2)	0	95(70.1)	4(2.6)	<1(0.2)	0	1(0.7)	73.8
Maricopa	9(6.7)	1(0.9)	86(64.8)	1(0.9)	1(0.8)	0	2(1.2)	75.3
Pinal	23(23.2)	0	68(69.6)	0	0	7(6.9)	2(1.7)	101.4
Pima	0	0	97(11.7)	0	3(0.3)	0	0	12.0
Cochise	13(10.7)	0	80(68.8)	7(6.4)	0	0	0	85.9
New Mexico								
Hildalgo	1(0.4)	0	76[4](23.0)	17(5.3)	0	0	6(1.9)	30.6
Grant	0	0	4(0.8)	96(17.4)	0	0	0	18.2
Luna	10(5.5)	5(2.7)	38[5](20.8)	43(24.0)	0	0	4(2.1)	55.1
Doña Ana	12(6.1)	0	60(31.7)	25(13.2)	<1(0.1)	0	3(1.4)	52.5
Texas								
El Paso	0	0	47(13.8)	48(14.2)	0	0	5(1.4)	29.4
Hudspeth	0	0	12[6](8.5)	88(60.4)	0	0	0	68.9
Culbertson	0	0	60(32.7)	40(22.2)	0	0	0	54.9
Reeves	0	0	99(14.3)	0	<1(0.1)	0	<1(0.1)	14.5
Loving	0	3(0.9)	97(26.9)	0	0	0	0	27.8

TABLE 3-19 (CONTINUEO)

State/County	Irrigated Agriculture	Oryland Agriculture	Oesert Scrubland[1]	Oesert Grassland	Riparian	Woodland	Oisturbed[2]	Total (linear miles)
Texas (Continued)								
Winkler	0	2(0.4)	76(14.4)	21(3.9)	0	0	1(0.2)	18.9
Ward	0	0	75(16.0)	17(3.5)	0	0	8(1.7)	21.2
Crane	0	0	79(33.4)	18(7.5)	0	0	3(1.4)	42.2
Upton	0	0	49(3.8)	43(3.3)	0	0	8(0.6)	7.7

Source: ERT

[1]Includes alkaline scrubland, lake bed and salt flats.

[2]Includes barren land, residential, commercial, and industrial areas.

[3]Includes 27 miles of alkaline flats at Oanby Lake.

[4]Includes 6.3 miles of alkaline scrubland.

[5]Includes 3.1 miles of alkaline scrubland.

[6]Includes 5.6 miles of alkaline salt flats.

Unusual and unique plant communities in this segment include Joshua tree woodlands, alkali sinks, desert washes, dune communities, and ironwood washes. Joshua tree woodlands occur in the creosote scrubland west of Barstow near Edwards Air Force Base on well drained slopes. Near Cadiz the route crosses alkali sink communities occurring on poorly drained alkaline flats, playas, and dry lake beds such as Danby Lake. Saltbush, sea-blite, and iodine bush are common species in alkali sinks (Williams Brothers 1976). As the route turns southeast and heads toward Blythe the creosote scrubland is limited to washes draining desert mountains. Ironwood washes, another community recognized as sensitive by the BLM, occur in a 30-mile area west of Blythe. Ironwood and palo verde occur in desert washes where increased water gives rise to denser stands of vegetation and more diverse wildlife communities. These desert wash communities in the lower Colorado River Desert have slightly different plant associations including species such as blue palo verde, cheese bush, and ironwood (BLM and NRC 1978). Desert dune communities occur in the Rice Valley in Riverside County. The pipeline crosses irrigated farmland near Blythe (about 10 percent of segment). At the proposed crossing of the Colorado River the pipeline crosses agricultural fields and a small band of salt cedar and willows. Downstream of the crossing (1,500 ft), bands of desert riparian scrub communities dominated by salt cedar, mesquite, willows, and arrowweed are present.

Wildlife. The sparsely vegetated Mojave Desert provides little habitat for large mammals, primarily desert bighorn sheep and coyote. Wild burros do not occur near the route. Desert bighorn occur in desert mountains where higher elevations provide adequate food and water. Desert bighorn may occur at Ship Mountain near Cadiz. Coyotes are common in desert washes where they hunt small mammals.

The Mojave Desert does support a high diversity of small mammals and reptiles. Common small mammals and reptiles include Merriam's kangaroo rat, little pocket mouse, southern grasshopper mouse, cactus mouse, desert night lizard, desert horned lizard, desert tortoise, sidewinder, and Mojave rattlesnake (Turner 1982). Common birds include Le Conte's thrasher, Gambel's quail, roadrunner, burrowing owl, red-tailed hawk, and golden eagle (Applied Conservation Technology 1980).

Threatened, Endangered, and Special Status Species and Communities. For the route from Emidio to Blythe, the cottony buckwheat, Coville's navarretia, hackberry, calico monkey flower, Comanche layia, Hartweg's pseudobahia, and Bakersfield cactus are known to occur on the Tejon Ranch near Tehachapi Pass (Larry Seeman Associates 1981). Sensitive species likely to occur along the pipeline in the desert area include the alkali mariposa lily, desert cymopterus, Mojave spineflower, and Parish's alkali grass in the Edwards Air Force Base and Kramer Junction areas. The Barstow wooly sunflower is known from areas near Kramer Junction and Barstow. None of these species are currently protected by state or Federal law. In Kern County the Joshua tree, all species of cacti, and all mariposa lilies are protected by County ordinance.

Rare wildlife species include the desert bighorn sheep, desert tortoise, Mojave ground squirrel, Tehachapi slender salmander, and red-legged frog. Nesting raptors include the red-tailed hawk, prairie falcon and golden eagle. Bighorn sheep are confined to the rocky desert-mountains such as Ship Mountain and the Old Woman Mountains.

The desert tortoise, a candidate threatened species for the Federal and state list and a BLM sensitive species, occurs along the pipeline route throughout the Mojave Desert. The proposed route would cross the BLM's Western Mojave Desert Crucial Habitat area along Highway 58 east of Edwards Air Force Base. Population density estimates vary; the highest densities are expected near Twelve-Gauge Lake pump station (see Map 2-1). The lowest densities occur farther to the west (Berry 1984, personal communication; BLM 1980b).

Mojave ground squirrel (a state-listed rare species) occurs throughout the desert scrubland habitat. Historical records for the red-legged frog (state-listed) have been reported for the Tejon Hills area about 25 miles east of Emidio. The Tehachapi slender salamander (Federal candidate, state-listed rare species) has been found on the Tejon Ranch in Pastoria Creek and Bear Trap Canyon (Larry Seeman Associates 1981). Golden eagles nest near the Kilbeck Hills and prairie falcons nest on or near the pipeline at Daggett and Newberry Springs (Rado 1984, personal communication).

Blythe to McCamey

Vegetation. Along this route segment, the pipeline crosses primarily desert scrubland, desert grassland, irrigated agriculture, and disturbed areas (Table 3-19). East of the Colorado River the pipeline crosses the lower Sonoran Desert. The area is characterized by low-lying relief with shrubs and dwarf shrubs dominated by the ubiquitous creosote bush, bursage, and brittlebush. Desert willow, palo verde, and ironwood occur along watercourses. Scattered remnants of mesquite are present near the Gila River (Williams Brothers 1976). As the pipeline route moves east and gains elevation, saguaro, ocotillo, gray thorn, and cat's claw are found on well-drained bajadas. Near Casa Grande, Arizona the pipeline crosses into the Arizona Upland Desert, a part of the Sonoran Desert, which is known for its giant cactus. The cactus scrub community type occurs on the coarser well drained soils of the bajadas that flank rocky mountains. Major species include saguaro, barrel cactus, organ pipe, and palo verde. Common shrubs include triangle bursage, brittlebush, creosote, ironwood, crucifixion thorn, chollas, and ocotillo. Riparian species include blue palo verde, mesquite, cat's claw, and desert willow. The eastern portions of the Arizona Upland Desert support dense stands of creosote bush along valley floors. Slopes are dominated by ocotillo, prickly pear, sotol, and sacahuista.

At the Gila River crossing some limited lands of desert scrub vegetation, primarily mesquite and palo verde occur on the west side. Where the pipeline crosses the San Pedro River, riparian vegetation is limited to an occasional cottonwood. Near Oracle, Arizona the pipeline crosses a small area of oak-pine woodland mixed with a mosaic of riparian and desert scrub communities. Common tree species include Emory oak, Arizona oak, alligator juniper, Apache pine, and Mexican pinon pine (Williams Brothers 1976). West of Wilcox, the pipeline would cross the Muleshoe Nature Preserve managed by the Arizona Nature Conservancy. Native desert riparian communities dominated by cottonwood, western sycamore, velvet ash and mesquite occur in the floodplains of Hot Springs Canyon. The eastern limit of the Sonoran Desert along the pipeline is the Soza Mesa. Creosote bush occurs on the mesa with some saguaro along the edge.

As the pipeline moves into New Mexico the vegetation becomes characteristic of the Chihuahuan Desert. Although dominated by creosote bush, the Chihuahuan Desert differs from the Sonoran Desert by lacking bursage and saguaro. The occurrence of co-dominant species and their distribution is a function of soil conditions (e.g., texture, chemical composition, etc.) and topography. On level terrain or gently sloping bajadas, predominately sandy soils support ocotillo, honey mesquite, soaptree yucca, banana yucca, and fourwing saltbush. Along arroyo banks, junipers, mormon tea, lechuguilla, purple prickly pear, and sotol are present. In arroyos, desert sumac, western hackberry, and/or desert willow may be found. Shallow soils, heavy limestone soils, and dune depressions have creosote bush, honey mesquite, tobosa grass, grama, and dropseed grasses. In some locales, blowing sand from unstable soils accumulate around honey mesquite, forming dunes. Mesquite dunes support some four-wing salt bush, and snakeweed (Williams Brothers 1976).

Near El Paso the pipeline route crosses the eastern limit of creosote bush and is an area of transition between desert and shortgrass plains. Snakeweed and shin oak occur in the transitional vegetation complex. Salt playas occur near Salt Basin, Texas and are devoid of vegetation per se but support species characteristic of the adjacent plant communities at their periphery.

At the Rio Grande River crossing the pipeline would cross agricultural lands; riparian zone vegetation is very limited. The proposed pipeline traverses the Trans-Pecos Desert Scrub in the vicinity of the Guadalupe Escarpment, a Permian limestone reef rising 1,000 to 3,900 ft above the southwestern edge of the Great Plains. At higher elevations on rocky slopes, junipers and oaks are abundant. On lower slopes dominant species include agave, yucca, sotol, and various grasses such as grama, muhly, alkali sacaton, and vine mesquite grass. On gravelly plains, dominant plant species include tarbush, creosote bush, cat's claw, and mesquite (Williams Brothers 1976).

The Pecos River crossing at the eastern terminus of the Trans-Pecos region has a limited riparian plant community consisting of salt cedar in almost pure stands.

Near the New Mexico-Texas border a transition from shrub steppe to grassland vegetation occurs. Williams Brothers (1976) classified the area as the Semi-Arid Short Grass Prairie. The most abundant grass species include buffalo grass, blue grama, sideoats grama, black grama, little bluestem, western wheatgrass, Indian grass, and switchgrass. In addition to these grasses, significant stands of mesquite, creosote bush, sage, and shin oak are found throughout the area. Various forbs and weedy species include sunflower, thistle, pigweed, and horseweed.

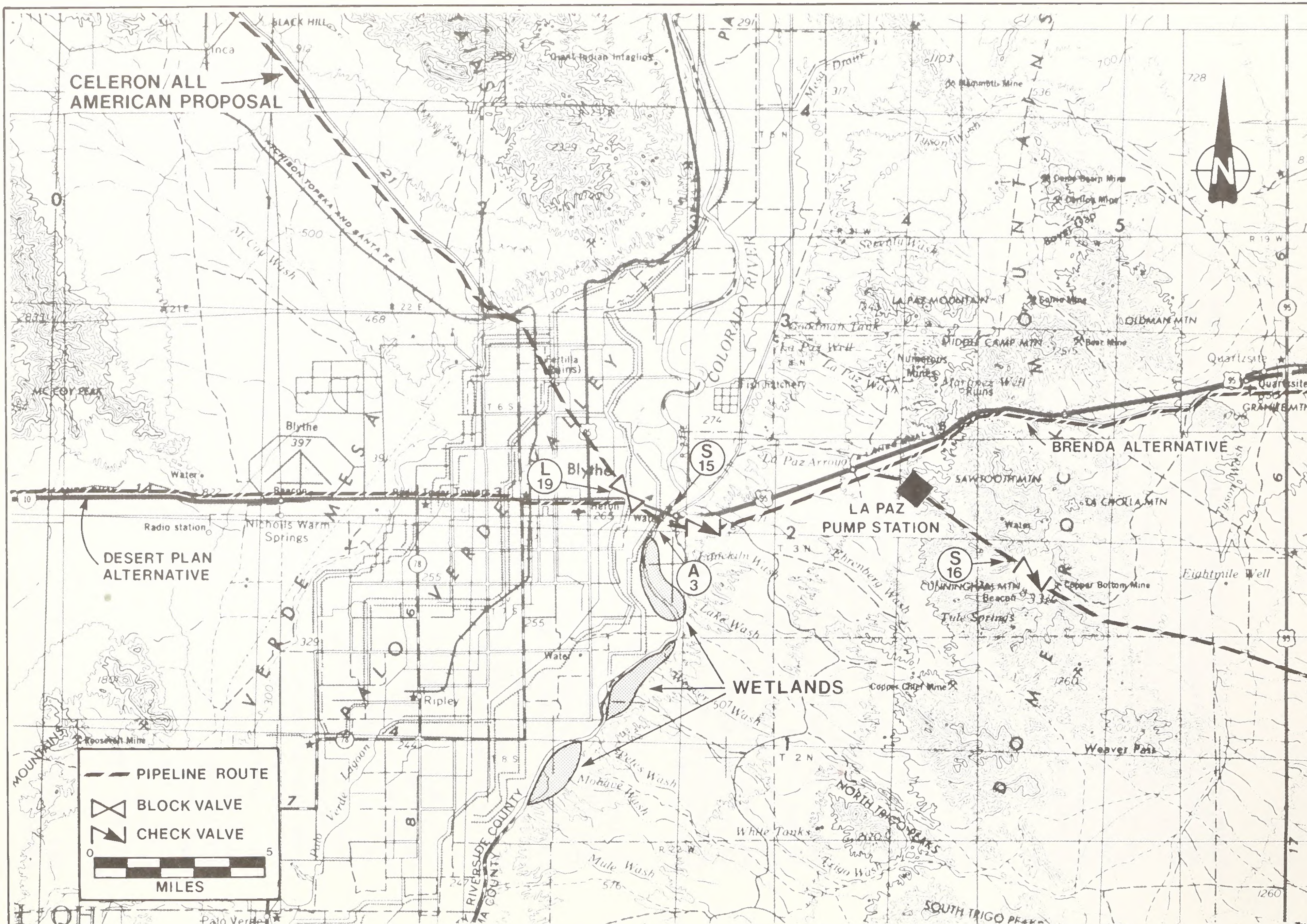
Perennial short-grass prairie is disturbed over large areas because of cultivation and overgrazing. In addition to grama grasses and buffalo grass, sand dropseed becomes common. Snakeweed, plains yucca, and honey mesquite also occur. Honey mesquite stabilizes blowing sand, forming dunes. Associated with mesquite dunes are snakeweed, shin oak, and sand sage. Bluestem grasses inhabit blow-outs on sandy soils.

Wildlife. Below the proposed pipeline crossing of the Colorado River, large man-made "wetlands" comprised of desert riparian scrubland and open water are present (see Map 3-3). These wetland areas were established to mitigate impacts on wildlife associated with dredging in the Colorado River (Celentano 1984, personal communication). Extensive wetlands also occur 20 miles downstream of the crossing in Cibola and Imperial NWRs. The scrublands and quiet backwaters immediate downstream of the crossing provide habitat for resident and migratory waterfowl and marshbirds (Powell 1984, personal communication). No records of Yuma clapper rail breeding have been reported in these wetlands, probably because of human disturbance associated with fishing and boating, although this area is otherwise suitable habitat. Several other species of non-game birds, mammals, amphibians, and reptiles also occur in these wetlands. Yuma clapper rail have been reported for the wetlands in the NWRs (Powell 1984, personal communication).

In Arizona, the lower Colorado River Valley fauna contains a number of unique sand-adapted lizards and snakes, some of which are restricted in their distribution. These include the fringe-toed lizards, flat-tailed horned lizard, banded sand snake, and sidewinder. Rocky outcrops, bajadas, talus slopes, washes, and gravel plains support different herpetofauna such as the chuckwallas, desert spiny lizard, brush lizard, southern desert horned lizard, western whiptail, and desert horned lizard (Turner and Brown 1982).

Bird and mammal species found in the Sonoran Desert reflect the recent evolution of the desert and are the same species found in the southwest's drier warmer regions. Typical species include coyote, desert cottontail, desert pocket mouse, Arizona cactus mouse, roadrunner, mourning dove, cactus wren, black-tailed gnatcatcher, phainopepla, and black throated sparrow. In the Sonoran Desert, riparian communities support a diversity of wildlife including several species not found in other habitats such as the raccoon, ring-tailed cat, spotted skunk, pocket gophers, and bats. Several nesting species requiring trees, cliffs, and streams, such as summer tanager, Mississippi kite, zone-tailed hawk, black hawk, grey hawk, and various hummingbirds may occur in riparian desert woodlands. Such an area occurs along the pipeline in Bass and Double R Canyons near Hot Springs, Arizona. This area is within the Arizona Nature Conservancy's Muleshoe Ranch Preserve.

In New Mexico the Chihuahuan Desert desert scrub communities and the Trans-Pecos grasslands support similar wildlife communities as the Sonoran Desert although somewhat less diverse and the species are less



MAP 3-3 PROPOSED PIPELINE CROSSING OF THE COLORADO RIVER

abundant. Scaled quail and white-necked raven are considered characteristic species. Grassland adapted species face diminishing habitats because livestock and overgrazing are eliminating much of the native tobosa grassland (Brown 1984). Along the pipeline several species of reptile, including some rare species, are likely to occur. Characteristic Chihuahuan Desert herpetofauna include Texas banded-gecko, reticulated gecko, greater earless lizard, roundtail horned lizard, spiny lizard, several whiptails, Trans-Pecos rat snake, western hooknose snake, whipsnake, and rattlesnake (Brown 1984). Introduced big game animals like the ibex, aoudad and mouflon (wild sheep) may occur in the desert mountains near the New Mexico-Texas border.

Threatened, Endangered, and Special Status Species and Communities. No federally or state listed plant species are known to occur along the pipeline route in Arizona (Reichenbacher 1984, personal communication). Sneed's pincushion cactus, a federally listed endangered species, occurs near the pipeline route in New Mexico in the Anthony Gap area. Although critical habitat has not been designated for this species, it occurs only in the Franklin Mountains of New Mexico and Texas. It is found on limestone ledges in desert grasslands between 4,300 and 5,400 ft (New Mexico Natural Heritage Data Base 1984). Surveys of the pipeline route conducted in May of 1984 indicate the proposed route would not affect Sneed's pincushion cactus. Populations of the cactus do occur north of the proposed route.

Several species of commerically valuable cactus occur along the route in Arizona. These species are protected by Arizona law and will be salvaged prior to construction (Countryman 1984, personal communication). Several species of protected wildlife and important habitats occur along the route at the Colorado River crossing, Kofa NWR, and at the Muleshoe Ranch Preserve near the Hot Springs pump station (see Appendix B). Cibola and Imperial NWRs occur 20 miles downstream of the proposed pipeline crossing of the Colorado River. Several sensitive species may potentially occur downstream of the Colorado crossing in man-made wetlands habitat (Map 2-1) and these include the black rail (Arizona and California State list), Yuma clapper rail (federally listed), southern bald eagle (federally listed), and osprey (Arizona State list). Black rails may occur in the marshy areas along the Colorado River, but Yuma clapper rail have not been reported in this portion of the Colorado River. Wintering bald eagles occur occasionally near Ehrenberg but are more numerous at Imperial, Arizona and Cibola NWRs Osprey nest 2 miles below the crossing (Powell 1984, personal communication).

Desert bighorn occur along the proposed route in Arizona. The route would cross between two lambing areas near Livingston Hills and lambing areas and watering holes in the Dome Rock Mountains. The Kofa NWR has the largest population of desert bighorn sheep in the United States with estimates of 800 bighorn sheep in the 660,000-acre refuge. The Celeron/All American pipeline route would cross about 25 miles of the Refuge along an existing 500 kV power transmission line and natural gas pipeline route. The pipeline route would intersect two migration corridors used by the sheep. One corridor is used by ewes and lambs in the late spring, and the other is used by rams to move to the rutting grounds on Black Mesa in fall (Haderlie 1984, personal communication). Desert bighorn also occur in the Eagletail Mountains and Buckeye Hills. Desert tortoise occur in this area in the saguaro-palo verde habitat.

Another sensitive area along the proposed route occurs near the Hot Spring pump station west of Wilcox, Arizona. In this vicinity the proposed route crosses the Muleshoe Ranch, a 51,380-acre land parcel leased by the Arizona Nature Conservancy. The area contains deciduous riparian woodlands, a unique and vanishing community in the southwest. The mature cottonwoods and western sycamore provide nesting habitat for several rare southwestern raptors such as the black hawk, grey hawk, and zone-tailed hawk. The streams also provide habitat for the Gila chub (see Fisheries Section 3.2.6). The Gypsum Dunes Nature Preserve managed by the Texas Natural Heritage Program occurs along the route south of Guadalupe National Park. This area has unique dune communities that are rare in western Texas.

3.2.8 Socioeconomics

The study area includes five counties in California, five counties in Arizona, four counties in New Mexico, and nine counties in Texas. Information sources for the regional overview include U.S. Census data, state employment statistics, community profiles, economic development information, annual state financial reports, and personal telephone interviews.

Section 3.2.8.1 will describe the economic and demographic characteristics of the five counties in California. Section 3.2.8.2 will overview all other counties in Arizona, New Mexico, and Texas traversed by the pipeline.

For additional demographic and economic information on regions that would be affected by the project refer to Table 3-20.

3.2.8.1 California Counties.

Santa Barbara County. The 1983 estimated population in Santa Barbara County was 313,500. Population growth in the county has stabilized between 1 and 2 percent per annum since the 1960s, with immigration accounting for over one-half of the total growth.

The county's economy is dominated by the services and retail trade industries (45 percent) reflecting the high tourist appeal of the area. This is followed by government, manufacturing and agriculture (38 percent). Total unemployment for 1982 averaged 7.9 percent which matched the previous high registered in 1974. The unemployment rate is expected to decline in 1984 to 7.5 percent (EDD 1983-1984).

The 1984 U.S. Department of Commerce, Bureau of Economic Analysis (BEA) estimate for per capita income in Santa Barbara County was $12,218. This was the highest of the five California counties in the study area.

TABLE 3-20

REGIONAL ECONOMIC PROFILE: POPULATION, EMPLOYMENT, AND FISCAL CONDITIONS STATISTICS

State	County	Estimated Population 1980[1]	Estimated Population 1983	Average Annual Increase (%)	Employment 1980	Employment 1982	Unemployment Rate (%) 1980	Unemployment Rate (%) 1982	Primary Industries
California	Santa Barbara	298,694	313,500[2]	1.6	139,700[6]	149,900[6]	6.1[5]	7.9[6]	Services, Trade, Government
	San Luis Obispo	155,435	168,100[a]	4.0	60,000	65,200	7.1	8.4	Government, Services, Trade
	Kern	403,089	442,800	3.2	170,900	184,400	7.7[d]	12.2[d]	Ag, Government, Trade, Services, Oil
	San Bernardino	895,016	985,900	3.3	<541,500[c]	<558,800[c]	7.6[d]	12.2[d]	Trade, Services, Mfg
	Riverside	663,166	731,200	3.3					Trade, Services, Ag
Arizona	Yuma/La Paz	90,554	93,700[3]	1.2	32,625[3]	33,350[3]	11.9[3]	16.3[3]	Trade, Government, Ag, Services
	Maricopa	1,509,052	1,633,100	2.7	708,300	743,200	5.9	7.9	Trade, Government, Mfg, Services
	Pinal	90,918	96,660	2.0	29,650	28,550	7.4	14.5	Government, Mining, Trade, Ag
	Pima	531,443	581,500	3.1	211,400	221,000	5.8	9.6	Trade, Government, Mfg, Services
	Cochise	85,686	91,100	2.1	25,575	25,925	8.8	12.1	Trade, Government, Mfg, Services
New Mexico	Hidalgo	6,049	6,738[4]	3.7	2,209[7]	2,315[7]	4.6[7]	10.0[7]	Services, Trade, Mining, Ag
	Grant	26,204	30,350	5.0	8,968	8,415	7.6	28.3	Trade, Government, Mining
	Luna	15,585	16,517	2.0	4,601	4,564	11.6	12.0	Government, Trade, Ag, Mining, Mfg
	Doña Ana	96,340	101,576	1.8	31,587	34,026	8.9	9.6	Government, Trade, Services, Mfg
Texas	El Paso	479,899	521,317[5]	2.8	164,134[8]	169,301[8]	9.1[8]	11.1[8]	Mfg, Trade, Government (military), Services
	Hudspeth	2,728	2,867	1.7	841	986	3.7	2.5	Ag, Government, Services
	Culberson	3,315	3,310	(0.05)	1,426	1,633	5.4	4.8	Services, Trade
	Reeves	15,801	15,982	0.38	5,458	5,777	5.5	9.4	Ag, Trade, Government, Services
	Loving	91	82	(3.41)	50	68	7.4	1.4	Oil
	Winkler	9,944	10,083	0.46	3,346	4,204	3.0	5.3	Oil, Government, Trade
	Ward	13,976	14,313	.80	6,038	7,133	2.7	6.7	Oil, Government, Trade
	Crane	4,600	4,775	1.25	1,949	2,008	3.1	5.6	Oil, Government, Trade
	Upton	4,619	4,698	.57	1,720	2,153	2.5	5.4	Oil, Government

TABLE 3-20 (CONTINUED)

State	County	Personal Income 1981 (Millions $)[9]	Per Capita Income 1981 ($)[9]	Retail Sales (Thousands $) 1981	Retail Sales (Thousands $) 1982	(%) Increase	Assessed Valuation 1982 (Thousands $)	Property Tax Levy 1982 (Thousands $)
California	Santa Barbara	3,705	12,218	1,310,419	1,357,971	3.6	8,958,231[10]	$ 97,853[10]
	San Luis Obispo	153	9,387	622,696	636,811	2.3	5,029,639	57,984
	Kern	4,069	9,742	1,945,827	1,923,651	(1.1)	20,953,827	223,704
	San Bernardino	8,946	9,465	3,329,268	3,425,415	2.9	19,950,620	242,312
	Riverside	7,138	10,262	2,679,775	2,733,961	2.0	18,567,137	217,465
Arizona	Yuma/La Paz	739	8,572	312,622[11]	320,137[11]	2.4	55,823[14,b]	4,028[14,b]
	Maricopa	16,593	10,610	6,394,128	6,607,012	3.3	5,257,522	451,214
	Pinal	758	8,095	193,987	187,627	(3.3)	305,816	39,294
	Pima	5,322	9,818	1,706,749	1,829,318	7.2	1,777,879	196,084
	Cochise	660	7,596	219,514	208,060	(5.2)	259,850	22,067
New Mexico	Hidalgo	50	8,456	47,357[12]	55,985[12]	18.2	89,222[12]	2,060[15]
	Grant	234	8,772	203,521	283,663	39.4	143,160	4,748
	Luna	114	7,241	95,662	101,929	6.6	66,268	1,638
	Doña Ana	686	7,237	546,307	610,804	11.8	348,824	7,152
Texas	El Paso	3,659	7,360	1,599,200[13]	1,658,300[13]	3.7	15,288,040[16]	75,613[16]
	Hudspeth	30	10,758	1,100	1,000	(9.1)	243,858	1,157
	Culberson	29	8,407	10,400	9,900	(4.8)	694,437	2,671
	Reeves	120	7,550	50,300	56,400	12.1	1,327,418	9,056
	Loving	2	26,042	0	0	0	1,173,427	2,122
	Winkler	111	10,597	36,200	38,100	5.3	2,249,452	6,728
	Ward	160	10,905	55,600	64,800	16.5	2,532,420	13,841
	Crane	57	11,821	11,100	14,500	30.0	4,312,487	7,686
	Upton	59	12,651	14,600	17,000	16.4	1,395,496	5,846

[1] U.S. Bureau of the Census.
[2] California State Department of Finance 1983.
[3] Arizona Department of Economic Security 1983.
[4] Estimate: Bureau of Business Research, University of New Mexico.
[5] Estimate: Texas Department of Water Resources 1983.
[6] California State Employment Development Department.
[7] New Mexico Employment and Security Department 1983.
[8] Texas Employment Commission.
[9] Bureau of Economic Analysis, U.S. Department of Commerce
[10] California State Board of Equalization.
[11] Arizona Department of Revenue.
[12] State of New Mexico Taxation and Revenue Department.
[13] Bureau of Business Research, University of Texas.
[14] County Treasurer (primary Valuation).
[15] New Mexico Local Governments and the Property Tax.
[16] Annual Report for Tax Year 1982, Texas State Property Tax Board

[a] 1982 figure.

[b] 1983 figure.

[c] This figure represents total employment for both San Bernardino and Riverside Counties.

[d] This figure represents the unemployment rate for San Bernardino and Riverside Counties.

In January 1983, Santa Barbara County's total permanent housing stock was estimated at 119,435 units with an average household size of 2.6 (California State Department of Finance 1983). The estimated vacancy rate for the county was 4.1 percent. The low vacancy rate county-wide implies a shortage of housing for the existing population. Over 5,577 rooms are available for transient accomodations within reasonable commuting distance of the proposed pipeline routes. Occupancy rates average 70 to 80 percent year-round and during peak tourist season which is June to September for the coastal area and August to November for LPNF, occupancy is often higher than 90 percent. Approximately 1,735 state and private campsites are available throughout the study area. Public campgrounds run at or above capacity during the summer months. Table 3-21 shows overnight lodging and camping sites in proximity of the pipeline routes.

Water, sewer, electrical, police, health and other governmental services are adequately provided to the existing population throughout the county, except for water services supplied by the Goleta Water District, which is currently under a moratorium for new hook ups.

San Luis Obispo County. San Luis Obispo County would not be affected by pipeline construction. For baseline information on the County refer to Tables 3-20 and 3-21.

Kern County. As of January 1983, Kern County had an estimated population of 442,880. Population growth has averaged 3.2 percent per annum since 1980.

Kern County is consistently among the most productive agricultural counties and petroleum-producing counties in the nation. Five industries dominate the county's economy. Government, agriculture, retail trade, services, and mining (oil and gas production) together provide approximately 80 percent of all wage and salary employment. Per capita income in Kern County in 1981 was estimated at $9,742.

Although employment has increased an average of 3.9 percent per year since 1980, unemployment has also increased, reaching a high of 12.2 percent in 1982. The high unemployment rate is largely due to immigration. Unemployment is expected to decline to 11.8 percent in 1984 (EDD 1983-1984).

The 1983 housing stock was estimated at 165,959, with an average household size of 2.8. The county-wide vacancy rate is 8.3 percent (California State Department of Finance 1983).

Over 5,251 rooms are available for transient accomodations within reasonable commuting distance of the proposed pipeline routes. There are a number of state and private campgrounds available in Kern County. All public services and facilities are adequately provided to the existing population.

San Bernardino and Riverside Counties. Population in San Bernardino County numbered 985,000 in 1983. Since 1980 the county has averaged an annual growth rate of 3.3 percent. The proposed route of the pipeline would traverse Barstow, a city with a population of 18,800.

TABLE 3-21

HOUSING AND PUBLIC SERVICES

State	County	Housing					Public Service		
		Total Units 1980[1]	% Renter Occupied 1980[1]	Percent Vacancy 1980[1]	Number Hotel/Motel Rooms[2]	Number Campsites/ R.V. Sites[2]	Full Service Hospitals 1983[3]	Total Beds 1983[3]	County Law Enforcement Employees 1982[4]
California	Santa Barbara	113,933	NA	4.0	5,577	1,735	10	1,041	230
	San Luis Obispo	66,070	40	11.9	2,040	NA	4	481	167
	Kern	154,321	39	9.4	5,251	222	14	1,236	262[5]
	San Bernardino	366,136	32	15.7	1,467	NA	21	3,398	NA[6]
	Riverside	291,783	32	16.7	488	2,081	14	2,256	NA
Arizona	Yuma/La Paz	37,501	31	12.3	70	4-5,000	1	220	16[5]
	Maricopa	610,782	31	8.6	19,811	6,969	30	6,929	2,315[5]
	Pinal	34,080	30	8.0	1,048	1,278	5	210	158
	Pima	218,609	34	9.4	7,490	2,540	13	2,665	739[5]
	Cochise	32,564	34	10.3	374	66	6	257	108
New Mexico	Hidalgo	2,326	42	17.7	300	70	0	0	NA
	Grant	9,631	28	10.0	570	NA	2	370	35
	Luna (Deming)	6,290	26	11.0	1,463	394	1	48	30
	Doña Ana (Las Cruces)	33,584	36	9.5	336	NA	1	177	96
Texas	El Paso	147,766	41	4.7	5,624	534	14	2,367	831[5]
	Hudspeth	1,059	41	22.3	18	2	0	0	10
	Culberson	1,123	35	12.1	500	17	0	0	11
	Reeves	5,450	31	12.1	634	25	1	62	31
	Loving	47	32	27.6	0	0	0	0	1
	Winkler	3,802	24	10.2	120	12	1	61	12
	Ward	5,246	22	9.1	1,241[7]	25	1	49	14
	Crane	1,683	26	7.7	20	5	1	28	8
	Upton	1,852	30	15.7	99	34	1	29	12

[1]U.S. Bureau of the Census 1980.

[2]Chamber of Commerce, Economic Development Department, Tourist Bureaus, Visitor Conference Centers, Personal Interviews.

[3]American Hospital Assocation 1983.

[4]FBI 1982, Uniform Crime Reports.

[5]City figures.

[6]NA = Not Available.

[7]Includes Midland and Odessa in Midland and Ector Counties.

The pipeline is proposed to run through the extreme eastern portion of Riverside County. The county-wide population was 731,200 in 1983. Blythe, the only major population center in eastern Riverside County, had a population of 7,150 in 1983. Blythe has shown an average annual increase in population of 1.7 percent since 1980, the lowest rate of any incorporated community in the county.

Both San Bernardino and Riverside Counties experienced adverse effects of the recession. The bi-county labor market lost over 5,100 jobs in 1982. Agriculture continues to provide an important mainstay in the Riverside and San Bernardino economies, but recent economic growth has centered in the services and trade industries, which reflects the importance of tourism in the region. Other important industries in the area include the government and manufacturing sectors, even though both sectors showed declines in employment in 1982.

In 1982 the unemployment rate for Riverside and San Bernardino Counties was 12.2 percent. This is 3.9 percent higher than in 1981 and 4.5 percent higher than in 1980. Per capita incomes in San Bernardino and Riverside Counties in 1981 were $9,465 and $10,262, respectively.

The 1983 housing stock was estimated at 397,996 total units in San Bernardino County and 317,483 total units in Riverside County. Average household sizes were 2.8 and 2.7, respectively. The average vacancy rate for San Bernardino County was 15.6 percent and 16.2 percent for Riverside County (California State Department of Finance 1983).

Overnight accommodations along the proposed route between Barstow and Blythe are minimal. The Barstow/Victorville area has an estimated total of 1,635 rooms. Blythe has a total of 488 rooms. Campsites along the route are also sparse.

Barstow and Blythe provide adequate public services and facilities to the existing population.

3.2.8.2 Arizona, New Mexico, and Texas Counties.

Arizona. Table 3-20 provides a baseline overview of demographic and economic characteristics of the five Arizona counties (La Paz, Maricopa, Pinal, Pima, and Cochise) along the proposed pipeline route.

Population in the five-county area totaled 2,496,060 in 1983. The greatest concentration of population occurs in Maricopa and Pima Counties, specifically the Phoenix and Tucson metropolitan areas. In 1980, the native American population for the six Indian communities within the vicinity of the pipeline route totaled 30,105. These communities are identified below:

Colorado Indian Reservation North of Ehrenberg, AZ	-	3 miles from ROW
Maricopa Indian Reservation Northwest of Casa Grande, AZ	-	1 mile from ROW

Gila Indian Reservation Northwest of Coolidge, AZ	-	4 miles from ROW
Papago Indian Reservation South of Casa Grande, AZ	-	13 miles from ROW
San Carlos Indian Reservation East of Globe, AZ	-	16 miles from ROW
Gila Bend Indian Reservation North of Gila Bend, AZ	-	18 miles from ROW

Manufacturing is one of the primary industries in Maricopa and Pima Counties, in addition to the government, trade, and services sectors which are major employers throughout the five-county study area. Maricopa, Pinal, Pima, and Cochise Counties share tourism as one of their primary industries. Mining is a significant contributor to the economy of Pinal County. Agriculture remains an important industry in Yuma County.

Unemployment in the region is high. In 1983, Maricopa and Pima Counties showed the lowest unemployment rate at 7.2 percent and 9.1 percent, respectively. These figures were lower than the 1982 figures. In contrast, Yuma and Pinal Counties experienced higher unemployment in 1983 than 1982 with unemployment rates at 18.7 percent and 18.2 percent, respectively (Arizona Department of Economic Security 1983). In 1980, unemployment within the indian communities ranged between 18 percent in the Salt River Pima-Maricopa community to 43 percent in the San Carlos Apache Tribe.

In 1980, a total of 933,536 total housing units were counted for the five-county Arizona study area. Yuma County showed the highest county vacancy rate at 12.3 percent; Pinal County showed the lowest rate at 8.0 percent.

Personal income in the five-county region is based largely on the sectors that provide the greatest share of employment: trade, services, and government. In 1981, total personal income in the five-county region was $2.4 billion (U.S. Department of Commerce, BEA 1983). The per capita income in the region varies greatly among counties. The more populated areas show higher incomes that correspond with the higher costs of living. Per capita income is summarized in Table 3-20.

Along the proposed pipeline route between Blythe, California, and Gila Bend (156 miles), temporary overnight accommodations are scarce. From Gila Bend to the New Mexico border adequate lodging is available. Estimated overnight rooms in the five-county area within commuting distance of the proposed pipeline total 28,793. Campsites in the same area total 15,810. Table 3-21 shows overnight rooms and numbers of campsites along the route for each county.

All public services and facilities are adequately provided to the existing population.

New Mexico. Table 3-20 provides a baseline overview of demographic and economic characteristics of the four New Mexico counties (Hidalgo, Grant, Doña Ana, Luna) that the proposed pipeline would traverse. Estimated population in the four-county area in 1983 was 155,181.

The government sector is considered primary to all four counties; it is the largest employer in Doña Ana County (White Sands Space and Missile Research and New Mexico State University at Las Cruces), and the second largest employer in both Hidalgo and Luna Counties. The services and trade industries reflect the importance of tourism as an important source of economic stability in the four counties. Agriculture, primarily ranching and irrigated farming, and mining are also important economic sectors in Grant, Hidalgo, and Luna Counties. Luna and Doña Ana Counties are experiencing increased manufacturing.

Unemployment has increased since 1980. Unemployment rates for Hidalgo, Grant, Luna, and Doña Ana Counties in 1982 were 10.0, 28.2, 12.0, and 9.6 percent, respectively (New Mexico Employment Security Department 1982). Grant County is especially vulnerable to shifts in employment rate, due to the fluctuations in copper mining activity.

Personal income in the four-county region is based largely on the sectors that provide the greatest share of employment: government, trade, services, and mining. In 1981 total personal income in the area was $1.1 billion (U.S. Department of Commerce, BEA 1983). Per capita income is shown on Table 3-20.

Housing units in the four-county area totaled 51,831. Vacancy rates are very high in all counties, ranging from 9.5 percent in Doña Ana County to 17.7 percent in Hidalgo County. Renter-occupied units showed especially high vacancies in the 1980 census.

Temporary overnight accommodations are sparse between the Arizona border and Las Cruces. Lordsburg, Deming, and Las Cruces have a large number of motel/hotel rooms, but are the only major population centers for a distance of 130 miles. Overnight rooms in the study area total 2,669, and campsites total 465. Table 3-21 shows numbers of motel/hotel rooms and campsites in proximity to the proposed route.

The Las Cruces water system is operating at 95 percent capacity. Expansion of the system is in the planning stages. All other public services are adequate for existing populations.

Texas. Table 3-20 provides a baseline overview on demographic and economic characteristics of the nine Texas counties traversed by the proposed pipeline. Estimated 1983 population in the nine-county area totaled 577,427.

In many counties trade or services and government are major areas of employment. Government generally employs between 15 to 25 percent of the total work force.

In Crane, Loving, Reeves, Upton, Ward, and Winkler Counties, mining (oil and gas production) employs a significant portion of the work force, ranging from 28 percent in Winkler to 85 percent in Loving. Manufacturing is an important employment sector in the more populated county of El Paso (23 percent). Agriculture is strong in Hudspeth and Reeves Counties, accounting for 16 percent and 12 percent of the total work force. Agriculture in these areas consists mainly of ranching and irrigated farming (Texas Employment Commission 1983).

Unemployment rates vary from county to county. Since 1980 unemployment rates have increased in El Paso, Reeves, Winkler, Ward, Crane, and Upton Counties, and decreased in Hudspeth, Culberson, and Loving Counties. The three most populated counties showed the highest unemployment rates in 1983, El Paso (11.1 percent), Reeves (9.4 percent), and Ward (6.7 percent).

Personal income in the nine-county region is based largely on the sectors that provide the greatest share of employment, that is, trade, services, government, and mining (oil and gas production). In 1981, total personal income for the region was $4.2 billion (U.S. Department of Commerce, BEA 1983). Per Capita income is shown in Table 3-20.

Housing units in the area totaled 168,028 in 1980. Vacancy rates ranged from a low of 4.7 percent in El Paso to a high of 27.6 percent in Loving, closely followed by Hudspeth at 22.3 percent. Area-wide housing vacancies appear high.

Temporary overnight accommodations are rare along the 200-mile stretch between El Paso and Ward Counties. The total estimated number of overnight rooms within commuting distance of the pipeline in the nine Texas counties totals 8,639, but most of these accommodations are in the cities of El Paso, Pecos, Odessa, and Midland. Campsites in proximity to the pipeline route are few. Table 3-21 shows the numbers of motel rooms and campsites in each county. Public facilities and services are adequately provided in all population centers.

3.2.9 Land Use and Recreation

The following sections focus on sensitive issues involving existing land ownership and land use patterns, land use regulations and policies, and recreational facilities and use patterns that may be affected by the proposed pipelines. Special management areas are discussed including wilderness areas. Appendix D contains detailed data on BLM and Forest Service areas that are under consideration for wilderness.

3.2.9.1 Las Flores to Emidio

Land Ownership and Land Use Patterns. Land uses along the pipeline segment from Las Flores to Emidio are shown in Tables 3-22 and 3-23. The Celeron/All American route would parallel US Highway 101 on the north side along Santa Barbara County's southern coast. Refugio State Park is within 0.5 mile of the route near milepost 3. The route crosses primarily grazing land between side canyons containing riparian vegetation. Several ranch residences are within 1 mile of the pipeline.

TABLE 3-22

LAND USES FROM LAS FLORES TO EMIDIO

(In Linear Miles)

Applicant	Total	Rangeland	Shrubland and Woodland	Irrigated Agriculture	Dryland Agriculture	Commercial Industrial	Residential	Other
Celeron/All American								
	121.5	65.3	29.8	20.7	1.0	2.7	0.7	1.3
Getty								
	113.0	56.3	28.9	21.2	1.0	2.4	0.7	2.5

Source: ERT

Key:
Rangeland = Grassland and Alkali Shrub
Shrubland and Woodland = Oak Woodland, Riparian Woodland, Coastal Sage Scrub, Chaparral
Other = Disturbed Lands and Washes

The Vista del Mar Elementary School is located adjacent to the proposed pipeline and the existing Getty facility. Beyond the industrial facility is the small commercial development of Gaviota (a gas station, restaurant, and motel) which is also adjacent to the proposed route. The Celeron and Getty routes cross at separate locations into Gaviota State Park. The routes rejoin outside the park and pass through oak woodland until crossing adjacent to several residences near the junction of US 101 and California Highway 1.

Both proposed routes (Celeron/All American and Getty) would pass through oak woodland and productive rangeland to the Santa Ynez Valley where they split and pass east and west of the community of Buellton and cross irrigated cropland. The Getty route passes through areas of irrigated fields, vineyards, and pasture land before rejoining the Celeron/All American route. At the Sisquoc River more irrigated cropland and vineyards would be crossed before the routes enter La Brea Canyon and the LPNF.

TABLE 3-23

SENSITIVE LAND USES WITHIN OR ADJACENT TO LAS FLORES TO EMIDIO PIPELINE CORRIDORS

Pipeline	Milepost	Feature	Proximity to Pipeline
Celeron/All American	3	Refugio State Park	0.2 mile
	10	Vista del Mar School	Adjacent
	11	Residential/Commercial Area	Crosses
	12	Gaviota State Park	Crosses
	23	Town of Buellton	Adjacent
	44	Los Padres National Forest	Crosses
	83	Irrigated Cropland	Crosses
	89	Irrigated Cropland	Crosses
	107	Cropland	Crosses
Getty	2	Gaviota State Park	Crosses
	3	Roadside Rest Area	Adjacent
	8	Residential/Commercial Area	0.1 mile
	12	Town of Buellton	Crosses
	22	Residential Area	Adjacent
	26	Commercial Area	Adjacent
	40	Los Padres National Forest	Crosses
	86	Cropland	Crosses
	104	Cropland	Crosses

Source: ERT

La Brea Canyon, as described under the Recreational Facilities and Use section, is a popular recreation use corridor with four campgrounds. The routes generally follow the creek bottom until the junction with

Bear Canyon, where the Celeron/All American line ascends a ridge and crosses a Forest Service RARE II Further Planning Area (FPA) (see Appendix D for a description of this FPA) before returning to La Brea Canyon. The Getty route follows the bottom of the canyon in this area. Both routes then cross the Miranda Pine FPA, the Sierra Madre Road and the Spoor Canyon FPA.

Descending the Sierra Madre Mountains, both pipelines would follow similar routes crossing rangeland and irrigated cropland in the Cuyama River Valley. After crossing a section of rangeland, the routes enter the irrigated cropland of the San Joaquin Valley and pass within 1 mile of several farm residences before reaching the Emidio site.

The Solomon Hills, Zaca substation, and Cuyama River transmission line routes to the Sisquoc pump station, all in Santa Barbara County, would pass through primarily grasslands and oak woodlands. The latter line would parallel existing roads and avoid irrigated cropland and residential areas.

The mountainous portions of the proposed route, as well as coastal and eastern foothill segments, have experienced large-scale damaging forest and range fires in the past. During dry years and under strong easterly wind conditions, large parts of mountainous areas present extreme fire danger and are sometimes closed to recreational use (Heinze 1984). Fire season is normally May through October. Much of the pipeline segment passing through the LPNF has not burned since a 59,600-acre fire in 1922, so potential fuel for fires is at very high levels in this and other areas. The Kern County and Santa Barbara Fire Departments as well as the California Department of Forestry, Forest Service, and BLM are responsible for fire suppression actions along various parts of the pipeline.

Prescribed (controlled) burning is a tool used by the LPNF to enhance forestry, grazing, and recreation opportunities. Part of the area crossed by the pipeline is an area planned for prescribed burning in 1985 (Wenstrom 1984, personal communication).

Land Use Regulations and Plans. County and city land use regulations and plans that may be affected by the proposed pipelines are listed in Table 3-24 and summarized below. California state and Federal regulations and plans potentially affected are described in latter sections.

County and city regulations and plans that typically affect pipeline construction include zoning and flood plan ordinances, comprehensive and land use plans, and, in some cases, specific development plans for subdivisions. Santa Barbara County has two unique regulations: a coastal plan and related zoning ordinance that applies to a narrow band of coastal lands, and a petroleum ordinance that provides standards for facilities transporting petroleum. All counties, cities, and states require permits for crossing roads under their jurisdiction. Review of construction plans by emergency services agencies, fire departments, flood control districts, county commissioners and planning commissions is generally required.

TABLE 3-24

COUNTY LAND USE REGULATIONS AND POLICIES

County/City	Land Use Regulations & Policies	Plans/Permits Required	Miscellaneous Review	Comments
California				
Santa Barbara	County Code Comprehensive Plan Coastal Plan Zoning Petroleum Ordinance	Coastal Development Conditional Land Use County Parks ROW/Beach Access Final Development Plan	Fire Department Emergency Service Coordinator	Pipeline permitted use in all zoned districts Coast line is Environmentally Sensitive Habitat area
San Luis Obispo	County Code	Building and Construction Roads Flood/Hazard Area Drainage Plan Development Plan (For Pump Station)	Planning Commission	In hazard area
Kern	Comprehensive Plan Specific Development Plans Zoning	Route Siting Study Pump Station Permit	Public Works Department Health, Fire, Agricultural Departments Water Agency	Pipeline permitted in any zone--most is Agriculture Concerned with setback from roads
San Bernardino	General Plan Joint Utilities Management Plan	Site Approval for Pump Station Disaster Plan	Flood Control District Road Department County Officials	Exempt from zoning code Consolidate with existing pipeline or electrical corridor
Riverside	Comprehensive Plan Consolidated Corridor Plan	Consistency with Plans		Crosses Colorado River at Blythe Major concern is consolidated corridors
Arizona				
La Paz	None	ROW for County Roads	None Identified	Public utilities are exempt from zoning regulations state-wide
Maricopa	Zoning Ordinance	None Identified	Flood Control District Highway Department Health Department	Crosses Gila River
Pinal	Zoning	None Identified	None Identified	
Pima	General Land Use Plan Zoning Ordinance Hillside Development Zoning Ordinance	None Identified	None Identified	Land is zoned "interim rural"

TABLE 3-24 (CONTINUED)

County/City	Land Use Regulations & Policies	Plans/Permits Required	Miscellaneous Review	Comments
Arizona (Continued)				
Cochise	Land Use Plan	Easement in County ROW Flood Plain Board	None Identified	None Identified
New Mexico				
Hidalgo	None	None Identified	None Identified	Concern that comply with federal and state regulations
Grant	None	County Roads	None Identified	
Luna	Subdivision Regulations	None Identified		Must be buried 42 inches minimum
Town of Deming	Zoning	Pipeline requirements	None Identified	
Doña Ana	Comprehensive Policy Plan Zoning Ordinance Road Excavation Ordinance	Drainage Study Special Use Utility Construction in County ROW Grading in County ROW	None Identified	Road crossing must be bored, not dug Must be buried 24 inches minimum
Texas				
El Paso	None	County Commissioners Court		State and federal regulations were considered adequate
Hudspeth	None	Same as above		Same as above
Culberson	None	Same as above		Same as above
Reeves	None	Same as above		Same as above
Loving	None	Same as above		Same as above

TABLE 3-24 (CONTINUED)

County/City	Land Use Regulations & Policies	Plans/Permits Required	Miscellaneous Review	Comments
<u>Texas (Continued)</u>				
Winkler	None	Same as above	None Identified	Fee of $250 for each county road crossed
Ward	None	Same as above	None Identified	Any future raising or lowering of pipeline will be at pipeline expense
Crane	None	Same as above	None Identified	None Identified
Upton	None	Same as above	None Identified	None Identified

Source: ERT

The following state and Federal agencies have land use plans that could affect pipeline location or design. The California Department of Parks and Recreation developed the Gaviota State Park General Plan (1979). The California Coastal Commission has a state coastal plan that affects tidelands in Santa Barbara County. The California State Lands Commission, as described earlier, has authority over ROW applications only on those state lands over which they have jurisdiction. The BLM is developing a Resource Management Plan for the Caliete Resource Area.

The LPNF is currently preparing a forest plan which includes a roadless area review for wilderness considerations. Under interim management policy the Forest Service must manage FPAs to protect their wilderness characteristics.

Recreational Facilities and Use. The proposed pipelines would follow US 101, a major route for visitors to the Santa Barbara area. The segment from Las Flores to Gaviota Pass has numerous scenic vistas and two state parks, Refugio and Gaviota. These parks have beaches and campgrounds that are very popular year round, especially during the summer months. Visitor use in 1982 totaled 262,998 and 202,310 days at Refugio and Gaviota State Parks, respectively (Santa Barbara County Energy Division 1984). Undeveloped beaches that are accessible to the public are also important along this route. The area's scenic beauty is a major attraction for tourists.

The proposed routes leave the coastal area by crossing into Gaviota State Park in the vicinity of the park access road off US 101 and continuing across the central part of the park. These inland areas are managed to preserve open space and scenic vistas, and receive limited day hiking recreational use (Preec 1984, personal communication). The Celeron/All American route then passes within 0.6 mile of the Fremont-Foxen Historical Marker and rest area on Gaviota Pass. Getty's route would be adjacent to this area.

Beyond Gaviota Pass the pipeline would pass through predominantly private land with low recreational use until entering the LPNF. The Celeron/All American and Getty routes follow the North Fork of La Brea Creek, a recreation use corridor, and cross two Forest Service FPAs and are adjacent to two other FPAs. See Appendix D for a detailed description of these FPAs. Recreational use in the La Brea Creek corridor is limited by a rough access road that is closed during periods of poor weather. There are four Forest Service campgrounds along the route that have limited developed facilities. Use of the campgrounds varies from 1,900 visitor-use days in 1982 at Wagon Flat to less than 500 at Horseshoe Springs (Forest Service 1983b). The greatest use occurs during hunting season (August-December) and spring. Hunting, off-road-vehicle (ORV) use, picnicking, and camping are the most popular activities within the corridor. Miranda Pines campground has one of the few stands of pines in the area and rugged La Brea Canyon has large mature sycamore and oak trees. These scenic features are important attractions for area visitors (Stone 1984, personal communication).

The Celeron/All American La Brea Canyon route avoids one Forest Service campground and narrow segments of La Brea Canyon, but it crosses into the Horseshoe Springs FPA. Appendix D describes the characteristics of this FPA. There is only limited dispersed recreation, such as hunting along this route, compared to the more heavily used corridor along La Brea Creek. The remainder of the line from the Cuyama Valley to Emidio has limited recreational use.

3.2.9.2 Emidio to Blythe

Land Ownership and Land Use Patterns. Land uses and sensitive land uses for this segment of the Celeron/All American pipeline are displayed in Tables 3-25 and 3-26. Ownership consists of private land (40 percent), state land (0.2 percent), and Federal land (60 percent). From the Emidio pump station the route follows existing roads and passes through irrigated cropland in the San Joaquin Valley for 14 miles before crossing desert grassland and small residential subdivisions. At about milepost 30 the proposed route is adjacent to the California State Women's Penitentiary. About milepost 41 the proposed route crosses the Pacific Crest National Scenic Trail in an area of desert grassland. Descending Tehachapi Pass the route passes within 0.2 mile of the small communities of Mojave, North Edwards, Desert Lake, and Boron. The route crosses into Edwards Air Force Base for 2.6 miles and parallels the Atchison-Topeka and Santa Fe Railroad mainline.

After entering San Bernadino County, the route continues along Highway 58 past Kramer's Junction to an area of scattered rural residences and irrigated agriculture on the western outskirts of Barstow. The route goes to the north of downtown Barstow but does pass through some residential subdivisions. To the east of Barstow, the route alignment is adjacent to an undeveloped portion of the Marine Corps Supply Center (Nebo Area) and generally parallels Interstate Highway 40, past the small community of Newberry Springs until California Highway 66 goes southeast toward Amboy.

The proposed pipeline alignment follows Highway 66 and the Atchison-Topeka and Santa Fe Railroad to the Twentynine Palms Marine Corps Base. At Amboy the route departs from the highway and parallels the railroad and the Cadiz Road to its crossing of California Highway 62 near Rice. Beyond Rice the route coincides with the Midland Road and railroad until it crosses irrigated cropland adjacent to the Colorado River. The Colorado River crossing is approximately 0.5 mile south of the I-10 bridge; the route crosses agricultural field and is adjacent to a residential development.

The Tejon pump station would receive electricity from an adjacent transmission line or a new line from the Emidio site. The latter would follow the proposed pipeline ROW across agricultural land except for the last 4 miles which would cross rangeland.

The new 66 kV transmission line serving the Cadiz pump station will follow an existing pipeline and secondary road to the Ward Valley. This portion of the ROW is not within a designated BLM utility corridor. The final segment lies within a BLM energy corridor. Land crossed by the ROW has sparse desert vegetation, typical of the area. The Old Woman WSA 299 and Ship Mountains WSA 300 are adjacent to but not crossed by the proposed ROW.

TABLE 3-25

LAND USE BY COUNTY AND STATE FOR THE CELERON/ALL AMERICAN PIPELINE ROUTE

EMIDIO TO McCAMEY

(In Miles Traversed)

	Miles Traversed	Rangeland	Woodland	Irrigated Agriculture	Dryland Agriculture	Commercial Industrial	Residential	Other
California								
Kern County	83.1	54.7	3.7	18.3	1.7	2.2	2.5	0
San Bernardino	171.8	157.7	0	3.3	0	6.2	1.9	2.7
Riverside	39.1	30.1	0	7.4	0	0.1	0	1.5
Total	294	242.5	3.7	29.0	1.7	8.5	4.4	4.2
Arizona								
La Paz	73.8	72.9	0	0.2	0	0.7	0	0
Maricopa	75.3	66.5	0	6.7	0.9	1.2	0	0
Pinal	101.4	69.6	6.9	23.2	0	0.5	1.2	0
Pima	12.0	12.0	0	0	0	0	0	0
Cochise	85.9	75.2	0	10.7	0	0	0	0
Total	348.4	296.2	6.9	40.8	0.9	2.4	1.2	0
New Mexico								
Hidalgo	30.6	22.0	0	0.4	0	1.9	0	6.3
Grant	18.2	18.2	0	0	0	0	0	0
Luña	55.1	41.7	0	5.5	2.7	2.1	0	3.1
Doña Ana	52.5	45.0	0	6.1	0	1.4	0	0
Total	156.4	126.9	0	12.0	2.7	5.4	0	9.4
Texas								
El Paso	29.4	28.0	0	0	0	0.7	0	0.7
Hudspeth	68.9	63.3	0	0	0	0	0	5.6

TABLE 3-25 (CONTINUED)

	Miles Traversed	Rangeland	Shrubland and Woodland	Irrigated Agriculture	Dryland Agriculture	Commercial Industrial	Residential	Other
Texas (Continued)								
Culberson	54.9	54.9	0	0	0	0	0	0
Reeves	14.5	14.4	0	0	0	0.1	0	0
Loving	27.8	26.9	0	0	0.9	0	0	0
Winkler	18.9	18.3	0	0	0.4	0.2	0	0
Ward	21.2	19.5	0	0	0	1.2	0.5	0
Crane	42.2	40.8	0	0	0	1.4	0	0
Upton	7.7	7.1	0	0	0	0.6	0	0
Total	285.5	273.2	0	0	1.3	4.2	0.5	6.3
Grand Total	1,084.3	938.8	10.6	81.8	6.6	20.5	6.1	19.9

Source: ERT

Key: Rangeland = Grassland and Alkali Shrub
Shrubland and Woodland = Riparian Woodland, Chaparral and Pinon-Juniper
Other = Disturbed Land, Alkaline Flats, and Washes

TABLE 3-26

SENSITIVE LAND USES WITHIN OR ADJACENT TO THE PROPOSED PIPELINE CORRIDOR, EMIDIO TO McCAMEY

	Milepost From Emidio	Feature	Proximity to Pipeline (miles)
California			
Kern	1	Residential area	0.01 - 0.2
	5	Residential area	0.3
	25	Residential area	adjacent
	30	California State Womens Prison	crosses
	33	Pacific Crest National Scenic Trail	crosses
	53	Town of Mojave	0.8
	70	Edwards Air Force Base	0.2
	71	Town of North Edwards	0.3 - 0.4
	79	Town of Desert Lake	0.1 - 0.2
	82	Town of Boron	0.2 - 0.6
San Bernardino	89	Town of Kramer Junction	adjacent
	108	Residential area	0.2 - 0.4
	113	City of Barstow	adjacent
	124	U.S. Marine Corps Supply Center (Nebo area)	crosses
	138	Residential area	adjacent
	140	Newberry Springs residential area	0.1 - 0.8
	197	Residential/commercial area	0.1
	200	Residential area	0.1 - 1.0
	210	Residential/commercial area	0.1
Riverside	271	Town of Midland	0.5 - 0.6
	289	Colorado River Aqueduct	crosses
	294	Colorado River	crosses
Arizona			
La Paz	317	Kofa National Wildlife Refuge	crosses
	342	Little Horn and Eagletail Mountains BLM WSAs	adjacent
Maricopa	402	Commercial area	0.2
	405	Gila River	crosses
	406	Arlington State Wildlife Area	0.3
	438	Town of Mobile	adjacent

TABLE 3-26 (CONTINUED)

	Milepost From Emidio	Feature	Proximity to Pipeline (miles)
Pinal	444	Commercial development	crosses
	448	Residential/commercial development	adjacent
	460	Residential development	crosses
	470	Residential development	adjacent
	478	Residential development	0.2
	483	Residential development	0.4
Pima	552	San Pedro River	crosses
Cochise	592	Residential area	0.2
<u>New Mexico</u>			
Hidalgo	661	Town of Lordsburg	adjacent
Grant		None	
Luna	713	City of Deming	crosses
	734	Residential area	crosses
Doña Ana	786	Rio Grande River	crosses
		Town of Anthony	0.8
<u>Texas</u>			
El Paso	802	Fort Bliss Military Reservation	crosses
	825	Hueco Tanks State Park	adjacent
Hudspeth		None	
Culberson	904	Guadalupe National Park	2.0
Reeves	966	Pecos River	crosses
Loving	994	Ranch	0.5
Winkler	1,001	County Airport	0.2
	1,002	Town of Wink	0.2
Ward	1,020	Town of Wickett	0.8
	1,025	Town of Monahans	crosses

TABLE 3-26 (CONTINUED)

	Milepost From Emidio	Feature	Proximity to Pipeline (miles)
Crane	1,060	Town of Crane	crosses - 0.5
Upton	1,082	Town of McCamey	0.2

Source: ERT

Land Use Regulations and Plans. County and city land use regulations and plans that may affect the location or design of the Celeron/All American Pipeline are listed in Table 3-24 and summarized below. This is followed by a brief description of state and Federal regulations and plans.

County and city regulations and plans that typically affect pipeline construction include zoning and floodplain ordinances, roadway excavation ordinances, and comprehensive and land use plans. San Bernardino County has a Joint Utilities Management Plan that controls the siting of electrical transmission lines and petroleum pipelines.

The California State Lands Commission issues ROW for the crossing of the Colorado River. The other states have similar requirements for any state lands.

The BLM California Desert District's California Desert Conservation Area Plan (BLM 1980c) presents detailed management prescriptions for the Mojave and Sonoran Deserts. Included in this document are utility corridors that were designed to meet future needs.

The Edwards Air Force Base crossing will require granting of a separate easement. The Air Force will evaluate the proposed plan and EIS and issue/deny a permit to construct. Stipulations and length of lease will be developed (Yonkers 1984, personal communications).

Recreational Facilities and Use. The pipeline route crosses the Pacific Crest National Scenic Trail near the summit of Tehachapi Pass. Eastward it enters the California Desert, an area that has large tracts of BLM lands open for public recreation. Each year this area attracts millions of visitors for activities such as hunting, rockhounding, and ORV use (BLM 1980c). Vehicle access is restricted in many localities to protect resources, while other areas are open to intense ORV use. The route generally avoids areas of unique recreational or resource value and passes through areas managed for "moderate" use and avoids areas classified as "controlled" or "limited" (BLM 1980c). In "moderate" use areas, vehicle access is restricted to existing routes of travel. These can be either maintained roads or undeveloped trails or washes which are shown on recreation maps or they may be marked by signs (BLM 1980c).

The proposed ROW is adjacent to, but outside of the Amboy BLM Wilderness Study Area (WSA) #304. The proposed route does cross into the Palen-McCoy WSA #325 near Brown's Well for about 8 miles. The ROW, as now located, would be about 150 ft within the WSA just west of the Brown's Well dirt road.

3.2.9.3 Blythe to McCamey.

Land Ownership and Land Use Patterns. Land uses for the Arizona, New Mexico, and Texas segments of the pipeline are shown in Tables 3-25 and 3-26. The majority of this portion of the route is the same as proposed and analyzed for the Sohio Project (Williams Brothers Engineering 1975), and in general, this route is immediately adjacent to the El Paso Natural Gasline which crosses the entire states of Arizona and New Mexico and parts of Texas. The proposed transmission lines for the Lordsburg, Anthony, Salt Flats, Wind pump stations would generally occur adjacent to or in the vicinity of the proposed pipeline corridor or existing transmission lines. There are no residential or agricultural lands crossed.

Arizona. Land ownership for the Arizona segment is as follows: 38 percent Federal, 29 percent state and local government, and 33 percent private.

From the Colorado River crossing the route passes through irrigated cropland for 0.2 mile adjacent to a residential development. The pipeline would follow a 500-kV transmission line and the El Paso gas pipeline through 25 miles of the Kofa NWR. Bordering and to the east of the refuge are three BLM WSAs: the Little Horn Mountains (#2-127), the Eagletail Mountains (#2-148), and the North Maricopa Mountains (#2-157). The El Paso gas line forms the northern border of these WSAs. About 8 miles of irrigated agriculture would be crossed before the Gila River crossing. A large amount of irrigated cropland would be encountered in Pinal County. A short segment of the Coronado National Forest is crossed near milepost 580. Rerouting around the Forest was not considered because of previous disturbance by the El Paso gas pipeline. From that point through milepost 463, irrigated cropland with scattered rural residences are encountered. Undeveloped desert grassland and shrubland is also found along the route until near milepost 585 when irrigated cropland is present until milepost 595. Scattered irrigated cropland is found between mileposts 617 to 624; this is the last agricultural or urban land use encountered in the remaining Arizona segment.

New Mexico. The New Mexico segment land ownership is as follows; 38 percent Federal, 26 percent state and local, and 36 percent private.

From the Arizona border the route passes through desert grassland and alkali flats to within 1 mile of the town of Lordsburg, adjacent to commercial development and the town's airport. It generally parallels I-10 and the Southern Pacific Railroad mainline near the existing natural gas pipeline corridor. Grazing is an important use of public lands in this area. The route passes through irrigated agriculture and scattered rural subdivisions to the south of Deming. Near milepost 732 another area of cropland is encountered. It is not until the fields of the Rio Grande River Valley that cropland or residential areas are crossed. The small town of Anthony is within 0.8 mile of the route. Irrigated agriculture ends about milepost 790 and is followed by desert shrubland to the Texas border.

Texas. The Texas segment land ownership is 96 percent private; 2 percent state; and 2 percent Federal land, all contained in Fort Bliss Military Reservation. Land uses along the route consist of rangeland (96 percent), commercial (2 percent), other land uses (2 percent), and a small amount of residential land use (less than 1 percent).

Fort Bliss Military Reservation would be crossed by the route and Hueco Tank State Park is adjacent to the route at milepost 825. The corridor passes within 1 mile of Guadalupe National Park and within 2 miles of Franklin Mountains Wilderness Park. Between the Pecos River crossing and the Winkler County Airport, the route passes through several oil fields and desert shrubland. It passes within 0.2 mile from the town of Wink, 0.8 mile of the town of Wickett, and crosses through the town of Monahans. From there until the proposed pipeline passes within 0.5 mile of the town of Crane, it crosses numerous oil fields and collection pipelines. Before reaching the Rancho Tank Farm, the pipeline would pass within 0.2 mile of the town of McCamey.

Land Use Regulations and Plans. Pima County, Arizona has a hillside development ordinance that affects construction in steep terrain. Review of construction plans is normally made by planning and zoning commissions, county commissioners, flood control districts, emergency service agencies, and fire prevention districts. The Yuma, Phoenix, and Safford Districts of the Arizona BLM would have land affected by the pipeline. Each is now developing a Resource Management Plan. The Phoenix and Safford Districts are in the process of drafting wilderness EISs for the WSAs that are adjacent to the proposed pipeline route (Hanson 1984, personal communications). Outside of Quartzsite, Arizona, the pipeline is adjacent to the La Posa Plain Long Term Visitor Area where camping is permitted during the winter months.

The Kofa NWR was established in 1939 for the protection of desert bighorn sheep (*Ovis canadensis mexicana*) and their environment. Management of the area falls into two categories; protection from adverse human impacts (poaching, removal and destruction of vegetation, competition with domestic animals, and incompatible developments), and improving water sources for wildlife. Use of the area by the public is permitted when compatible with the primary purpose of the refuge. This generally limits activities to wildlife/wildlands oriented recreation (Haderlie 1984). It has a refuge management plan and has completed a wilderness inventory. The proposed route is outside recommended wilderness. The FWS Regional Director must review pipeline construction plans and will make a determination of compatibility with refuge management directives prior to issuance of a ROW.

In New Mexico, the BLM Las Cruces District has a Resource Management Plan and has made an inventory of WSAs.

Fort Bliss Army Base would be crossed by the pipeline and has environmental regulations and designated historical areas. Pipeline proponents would need to comply with these requirements prior to issuance of a ROW (DeGarmo 1984, personal communication). Texas regulates pipeline operation through the Railroad Commission.

Recreational Facilities and Use. The Colorado River crossing receives considerable recreation use from boaters, fishermen, and water skiers. In the Blythe area there are several boat ramps and recreational facilities, including Mayflower County Park. A private marina/campground is located about 0.5 mile from the route. The Arizona side has no nearby recreational facilities.

The months of November through January are the slowest for overall recreation use along the Colorado River (Caldera 1984, personal communications). Retired persons are the primary recreationists during the winter. Fishing for catfish and bass are popular activities. Beginning in April when water and air temperatures rise, increasing numbers of water skiers and boaters use the river. Holidays and weekends are particularly busy during the spring and summer. Boating craft range from inner tubes to jet boats.

The next recreation area crossed by the pipeline would be the Kofa NWR and surrounding desert. An existing road that parallels the existing pipeline and transmission line is open to the public and is one of the most frequently traveled access routes in the refuge. An estimated 2,000 recreationists use the road each year, primarily during the winter months (Haderlie 1984, personal communication). Driving for pleasure, rockhounding, and wildlife observation are the most popular activities. Adjacent areas owned by the BLM and State of Arizona are frequented by ORV users, hunters, and rock collectors. The route is on the northern border of three BLM WSAs (see Appendix D for a description of these areas). The Arlington State Wildlife Area, located about 10 miles southwest of Buckeye, is the only other designated recreation area adjacent to the proposed pipeline in Arizona and New Mexico.

Hueco Tanks State Park is adjacent to the proposed route in Texas. Gudalupe Mountains National Park at its closest border is 650 yards from the route. Franklin Mountain Wilderness Park is within 2 miles of the ROW. The remainder of the route is mostly private land with limited recreational activity.

3.2.10 Transportation

Major roadways that would be intersected by the Getty and Celeron/All American pipeline are listed in Table 3-27. Major permits required for these crossings are noted in the Authorizing Actions Tables 1-1, 1-2, and 1-3. A description of the major highways and their approximate locations is discussed in the following sections.

3.2.10.1 Las Flores to Emidio. The Getty and Celeron/All American pipelines would cross US 101 four times each between Gaviota and north of Buellton in Santa Barbara County. US 101 is the major north-south roadway along coastal California. Other important crossings in Santa Barbara County would include California State Highways 1 (near Gaviota Pass) and 246 (at Buellton). California Highway 166, a major east-west thoroughfare through the Cuyuma Valley, would be intersected seven and five times by the Celeron/All American and Getty pipelines, respectively.

3.2.10.2 Emidio to Blythe. Interstate 5 and California State Highway 99, major north-south roads along the San Joaquin Valley, would be traversed a few miles east of Emidio. Near the Town of Mojave, the Celeron/All American pipeline would cross California State Highway 14 and would parallel California State Highway 58 to Barstow. Highway 58 would be intersected four times enroute to Barstow and would cross US 395 at Kramer Junction. Interstate 15, the major artery connecting

TABLE 3-27

MAJOR ROAD CROSSINGS

GETTY PIPELINE

Santa Barbara County, CA

U.S. Highway 101
State Highway 1
U.S. Highway 101
State Highway 246
U.S. Highway 101 (2)

San Luis Obisbo County, CA

State Highway 166

Kern County, CA

State Highway 33/166
State Highway 166 (3)

CELERON/ALL AMERICAN PIPELINE

Santa Barbara County, CA

U.S. Highway 101
State Highway 1
U.S. Highway 101
State Highway 246
U.S. Highway 101 (2)

San Luis Obisbo County, CA

State Highway 166 (3)

Kern County, CA

State Highway 33/166
State Highway 166 (3)
Interstate 5
State Highway 99
State Highway 202
State Highway 14
State Highway 58 (2)

San Bernardino County, CA

U.S. Highway 395
State Highway 58 (2)
Interstate 15
Interstate 40/State Highway 66 (3)
State Highway 62

CELERON/ALL AMERICAN PIPELINE (CONTINUED)

Riverside County, CA

U.S. Highway 95
Interstate 10

Yuma County, AZ

U.S. Highway 95

Maricopa County, AZ

State Highway 85

Pinal County, AZ

State Highway 93/187
Interstate 10
State Highway 87/287
U.S. Highway 89/80
State Highway 77

Cochise County, AZ

Interstate 10
U.S. Highway 666
Interstate 10

Hidalgo County, NM

Interstate 10/U.S. Highway 80 (2)

Luna County, NM

Interstate 10/U.S. Highway 70/80
State Highway 11

Doña Ana County, NM

State Highway 28
U.S. Highway 85/Interstate 10
State Highway 478
State Highway 460
State Highway 401

El Paso County, TX

U.S. Highway 54

CELERON/ALL AMERICAN PIPELINE (CONTINUED)

Hudspeth County, TX

U.S. Highway 62/180
State Highway 1111
U.S. Highway 62/180

Culberson County, TX

U.S. Highway 62/180
State Highway 1108 (2)

Reeves County, TX

U.S. Highway 285

Loving County, TX

State Highway 302

Winkler County, TX

State Highway 1232 (2)
State Highway 115

Ward County, TX

State Highway 1219
U.S. Highway 80/Interstate 20
State Highway 464
State Highway 18

Crane County, TX

State Highway 1053
State Highway 1233
State Highway 1601
U.S. Highway 385
State Highway 329

Upton County, TX

U.S. Highway 67

Source: ERT

Los Angeles and Las Vegas, would be intersected at Barstow. The pipeline would follow I-40 from Barstow and would intersect this route about 40 miles east of Barstow in the vicinity of Twentynine Palms Marine Corps Base. The pipeline would cross Highway 62 just east of the Town of Rice. Highway 62 is a major east-west route from the Palm Springs vicinity to the Colorado River. In Blythe, the pipeline would traverse US 95 and I-10, just west of the Colorado River.

3.2.10.3 Blythe to McCamey. The pipeline would cross the following major north-south roads in southwestern Arizona: US 95 (Yuma County) and Arizona State Highway 85 (Maricopa County). I-10 would be intersected three times in Arizona near the towns of Casa Grande, Wilcox, and Bowie. Other important highways to be crossed in southcentral and southeastern Arizona include State Highways 93/187 (Casa Grande), 87/287 (south of Coolidge), 77 (Oracle), US 89/80 (southeast of Coolidge), and US 666 (Wilcox).

The pipeline would parallel and cross I-10 and its associated east-west roadways four times in New Mexico (twice near Lordsburg, at Deming, and at Anthony). New Mexico State Highway 11, a north-south route between the Mexican border and Deming would be crossed by the pipeline. New Mexico State Highways 28, 478, and 460 all parallel the Rio Grande River and would be intersected by the pipeline in the vicinity of Anthony.

In Texas, the pipeline would intersect US 54 just north of El Paso. US 62/180, an east-west road between Carlsbad, New Mexico and El Paso, Texas would be crossed three times in Hudspeth and Culberson Counties. Other major roadways to be intersected by the pipeline include US 285 (Reeves County), Texas State Highway 302 (Loving County), Texas 115 (Winkler County), I-20/US 80, Texas 464, State 18 (Ward County), US 385, State 329 (Crane County), and US 67 (Upton County) near McCamey.

3.2.11 Cultural Resources

Data regarding cultural resources locations and sensitivities in the vicinity of the proposed pipelines were compiled using record searches and literature reviews at State Historic Preservation Offices (SHPOs), regional information centers of the California Archaeological Inventory, local universities and museums, BLM offices, and computerized data files; inspection of published and unpublished regional archaeological overviews; and discussions with professional archaeologists familiar with the regional culture history. Topographic maps depicting the locations of previously recorded sites were inspected, locations recorded, and site files accumulated for those sites within 0.5 mile of the proposed ROW. Cultural resources reports that describe the potentially impacted sites and archaeological fieldwork nearby were reviewed for developing concerns and research questions with which to evaluate sites (Weil et al. 1984; Effland and Green 1984; Reed 1984; Bamforth 1984).

In addition, Los Padres National Forest, BLM, and Fort Bliss cultural resource personnel were contacted to discuss study procedures, cultural resource expectation, significance criteria, and sensitivities.

Pertinent regional overviews, cultural resource management reports, dissertations, theses, and published articles were reviewed with regard to potentially significant historic, archaeological, and ethnographic sites in the study area. Evaluation of sites was conducted as specified by National Register criteria and, for California State and private lands, CEQA regulations. BLM documentation developed for the California Desert Conservation Area was reviewed to determine the extent of previously identified Areas of Critical Environmental Concern (ACECs) potentially affected by the project.

Tabulated lists of known cultural resources located within 0.5 mile of the proposed route for each of the pipeline segments discussed below are on file with the offices of the BLM districts crossed by the pipeline and LPNF. These listings include data on site number, types, cultural-temporal affiliations, National Register status, and related references (Weil et al. 1984; Effland and Green 1984; Reed 1984; Bamforth 1984). This information is summarized in the following discussions.

Native American communities near the project area were informed of the project by a letter of introduction describing project location and construction specifications. Personal contacts with tribal councils have also been initiated. It was requested that information be provided pertaining to tribal concerns regarding cultural resource sites and values. Similar requests will be made upon distribution of the draft EIR/EIS, and Native American concerns will be considered throughout the environmental review process.

3.2.11.1 Las Flores to Emidio. The previously recorded sites within 0.5 mile from the proposed route between Las Flores and Emidio fall into 11 site types including lithic scatters (chipping stations), bedrock millingstones or mortars, rock shelters, campsites, habitations/villages, quarries, pit houses, burial sites, historic sites, isolated, and unknown. Precise functional interpretation requires further research.

Of the 72 sites identified, 13 are located within the proposed Celeron ROW. Three villages (at least one with a burial area), one bedrock mortar, two rock shelters, and two historic sites are within the route. The historic sites are homesteads with structural remains and trash deposits.

Forty-nine sites have been previously recorded within 0.5 mile of the proposed Getty pipeline route; 7 of these are considered by their recorder to be eligible for inclusion on the National Register. Sixteen of the 49 sites would be located directly within the Getty ROW; 4 of these are considered eligible. The sites within the ROW include 2 village sites, 5 campsites, 2 bedrock mortars, 2 rock shelters, 4 historic sites, and 1 site of unknown description.

Transmission lines to the Sisquoc pump station could be constructed along the Solomon Hills Zaca substation and Cuyama River optional routes. One known historic site is located within 0.5 mile of the Solomon Hills route. No previously recorded sites are located within

0.5 mile of the Zaca substation and Cuyama River routes. Other sites may exist within or near the ROW but archaeological field survey has not been undertaken to determine the locations and nature of specific cultural resources.

No sites along this segment are listed on the National Register; however, based on site records at least one village and two historic sites are considered eligible for inclusion by the researchers who recorded them. The majority of sites both within and near the proposed routes require additional evaluation to determine their eligiblity or, on private lands, to determine their significance using criteria as stated in Appendix K of CEQA.

A 100 percent pedestrian survey was also conducted for cultural resources on the proposed pipeline routes within the LPNF. This survey identified no new cultural resource sites; however, approximately 3 miles of the route could not be surveyed due to the steepness of the terrain and thickness of the vegetation. If the proposed routes are approved, this area would be surveyed following vegetation removal and prior to earth movement.

As a result of field survey of 14 0.5-mile sample units (5 percent) between Las Flores and Emidio, 1 additional site, a habitation or campsite, was located. This site requires further evaluation to determine its significance.

Based upon previously recorded sites, their distribution, and other archaeological research, the length of both the proposed Celeron/All American and Getty routes between Las Flores and the entrance into the San Emigdio Mountains is assigned high sensitivity with regard to cultural resources within or near the ROW (Weil et al. 1984). In the San Emigdio Mountains cultural resource sensitivities decrease to moderate due to the rugged nature of the terrain and relative lower density of recorded sites. Along the Maricopa Flat cultural resource sensitivities are low to moderate with higher expectations along drainages and associated with springs.

3.2.11.2 Emidio to Blythe. Of the 86 sites identified along this segment, 10 are located directly within the Celeron/All American pipeline route. The previously recorded sites fall into 11 site types including lithic scatters (chipping stations), rock features, bedrock millingstones or mortars, rock shelters, campsites, habitations/villages, quarries, petroglyphs, historic sites, isolates, and unknown. Twelve lithic scatters were identified. These are sites with flaking debitage resulting from the manufacture of stone tools, but no features or structures. Two rock features, arrangements of rocks in circular, rectangular, or linear design, were previously noted. Seven bedrock millingstones or mortars were recorded; these sites represent the isolated processing of food materials by means of ground stone implements. Three rock shelters utilized by prehistoric societies were identified.

Village/habitation sites indicate a wide range of subsistence and nonsubsistence activities. A village site would include primary tools, secondary tools (used to manufacture primary tools), floral or faunal remains, and the widest range of artifactual materials for any given chronological period. A midden is often a component of a village site. Between Emidio and Blythe, 17 villages were previously recorded within 0.5 mile of the proposed pipeline route.

Four campsites were previously recorded within the proposed route. Campsites are smaller sites that were occupied for shorter periods by smaller groups of people.

Six quarries, locations where lithic materials have been extracted from a larger source, were identified. Flakes, cores, hammerstones, or prepared tools are often associated with this site type. One petroglyph was recorded near the pipeline route.

Historic sites are common (22) in the project area. These sites represent past activities of Hispanic and Euro-American populations in the Mojave Desert area, including early transportations, communication, mining, and military facilities.

One site between Emidio and Blythe, SBr-189, the Rancheria of Susugina, was determined to be eligible for inclusion on an the National Register; however, this site is outside the immediate project area. One historic town outside the immediate project area, SBr-3235H, was nominated by BLM but further information was requested by the SHPO prior to final evaluation. Thus, the determination is pending. Six other sites, including two within the pipeline route, are considered eligible for the National Register based upon the assessment of the site recorder. The majority of sites both within and near the proposed route require additional evaluation to determine their eligibility for inclusion in the National Register.

As a result of field survey of 23 0.5-mile sample units (40 percent) between Emidio and Blythe, 2 additional sites were located, a campsite and a village. Both require subsurface evaluation to determine their extent, integrity, and significance.

No archaeological or historical sites have been located within 0.5 of the proposed 37 mile-long transmission line to the Cadiz tank farm, however, no cultural resource surveys have been completed directly within the utility corridor. Prehistoric sites are most likely to occur along the base of the mountains, along washes, and near springs; historic sites are most likely to occur along transportation routes, in mining districts, and near water sources. One archaeological site has been previously recorded within 0.5 mile of the proposed gas pipeline route. The site is described as a campsite containing manos, metates, hammerstones, and windbreaks. No previously recorded sites are located within the ROW although archaeological survey has not been undertaken. Other sites could occur associated with the Marble Mountains.

Cultural resource sensitivities along the route vary depending upon associations with geomorphological, environmental, and cultural factors (Weil et al. 1984). The determinations are based upon review of BLM sensitivity maps pertaining to the California Desert Conservation Area studies, and other current archaeological data. General areas of moderate to high sensitivity include the Tehachapi Mountains, the Rogers Dry Lake Shoreline, portions of the line paralleling the Mojave River, the Lavic Lake, Bristol Lake, Cadiz-Danby Lake Basin, and areas bordering the Colorado River. Other areas are considered to have low to moderate cultural resource sensitivity, although occasional significant sites could occur.

3.2.11.3 Blythe to McCamey.

Arizona. Of the 144 sites previously recorded within 0.5 mile of the proposed Celeron/All American pipeline route in Arizona, 34 are located directly within the ROW. The previously recorded sites fall into 13 site types: lithic scatters, ceramic scatters/pot busts, ceramic and lithic scatters, sleeping circles/rock rings, campsites, villages/pueblos, trails, rock shelters, rock art, quarries, historic sites, hearths (historic), isolates, and type unknown. Lithic scatters, ceramic scatters, and lithic and ceramic scatters were the most numerous. These sites represent limited-use areas with specialized activities with no features or habitation structures as do sleeping circle/rock rings.

Villages or pueblos are the most complex sites found in the project area evincing a wide variety of activities and longer periods of occupation. Four villages or pueblos were previously recorded in the project area in Arizona and 15 campsites were identified.

Three trails, one rock shelter, one rock art locus, and one quarry site are located within 0.5 mile of the proposed route. The 13 historic sites, including 1 hearth, represent Euro-American occupation involving farming, ranching, communication, transportation, mining, and residential activities. Nine sites of unknown types were also identified.

Many sites have been evaluated for National Register eligibility during the cultural resource studies for the Palo Verde-Devers transmission line studies (Carrico and Quillen 1982). For that project several sites were tested; six sites, two directly within the pipeline route, are considered eligible. One site was salvaged prior to construction of the El Paso pipeline. Despite these previous cultural resource management procedures, 57 sites (8 within the pipeline route) require additional evaluation to determine their significance.

The following assessments of cultural resource sensitivity are based, in part, on the opinions formed as a result of review of existing site records, pertinent literature, and judgments provided by cultural resource managers working within the state (Effland and Green 1984).

Between the Colorado River and Dome Rock Mountains, areas along mountain slopes and major washes should have a low to moderate sensitivity. Between Dome Rock Mountains and Tyson Wash, the area is judged to have a low sensitivity except along washes such as Tyson Wash where there is moderate cultural resource sensitivity. The Palomas Mountains and New Water Mountains areas are judged to have a low to moderate sensitivity. Between the Ranegras Plain and the Eagletail Mountains the area is judged to have a low level of cultural resource sensitivity except along the slopes of the Eagletail Mountains where it is judged to have a moderate sensitivity. Between the Eagletail Mountains and the Harquahala Plain the area has a moderate sensitivity near Centennial Wash and near the slopes of mountains. Between Centennial Wash, the Gila River, and the town of Mobile, a low sensitivity is assigned although cultural resource sensitivity increases as the route approaches the Gila River.

Between Mobile and the Coolidge pump station a low to moderate level of sensitivity is assigned. Between the Coolidge pump station and the McClellan Wash the area is judged to have a low sensitivity except near the washes where sensitivities would be moderate to high.

Between McClellan Wash and Falcon Valley a low to moderate level of sensitivity has been assigned although a moderate level of sensitivity is expected in association with major washes. Between Falcon Valley and Peppersauce Wash a moderate level of cultural resource sensitivity exists although Peppersauce Wash may have a higher level of sensitivity. Between Peppersauce Wash and the San Pedro River a moderate level of sensitivity can be assigned; along the San Pedro River a high sensitivity is assigned. Between the San Pedro River and Hot Springs Canyon a very high sensitivity exists; the level of sensitivity decreases away from the river terraces. Between Hot Springs Canyon and Bowie a moderate to high sensitivity rating is assigned. From Bowie to the New Mexico state line a very high level of cultural resource sensitivity exists.

New Mexico. Of the 43 cultural resource locations previously recorded within 0.5 mile of the proposed Celeron/All American pipeline route in New Mexico, 5 sites are located directly within the route. Thirteen of the 43 sites were of unknown cultural affiliation; 22 sites were associated with the Mogollon tradition, 5 were classified as Archaic or Cochise sites; and 3 represent historic or Euro-American activities. No Paleo-Indian sites have been recorded. In general the Mogollon sites are characterized by stone tools and potsherds, and the Archaic sites by stone artifacts, and Euro-American sites are characterized by artifacts of metal and glass. Of the 22 Mogollon sites, 11 are attributed to the Mimbres branch and 11 to the Jornada branch. The major portion of the pipeline corridor, from the Arizona border to the vicinity of Las Cruces, is considered to be within the area occupied by the Mimbres branch; the easternmost portion from the lower elevations on the western side of the Rio Grande Valley eastward, is within the Jornada Mogollon branch. The Mimbres branch comprises one San Francisco Phase site, two Animas Phase sites, and eight sites for which there is insufficient data to determine phase. Of the Jornada branch sites, one is attributed to a Late Pithouse period occupation, four are ascribed to the Pueblo period, and the remainder are of unknown phase.

The previously recorded sites fall into nine site types: rock shelters, caves, ceramic scatters, lithic scatters, ceramic and lithic scatters, campsites, hamlets, villages/pueblos, historic dumps, and unknown. A single cave site was recorded, evidently representing a prehistoric occupation of a cave or rock overhang. Seven ceramic scatters were recorded; sites of this type yield potsherds but no stone artifacts, features, or habitation structures. Seven lithic scatter sites with chipped or ground stone artifacts are included in this category. Five sites are classified as ceramic and lithic scatters. These sites lack features and evidence of permanent habitation.

The most common site type represented is campsite. Campsites yield ceramic and/or lithic artifacts in association with hearths and were probably inhabited on a short-term basis. One hamlet and one pueblo were recorded. The hamlet evinces the remains of pithouses, and the pueblo evidences extensive surface structures. Three sites are described as "dumps" and are deposits of Euro-American artifacts. Three other sites are of unknown function and type.

None of the previously recorded sites within 0.5 mile of the pipeline route (including the five directly subject to impacts) have been determined to be eligible for nomination to the National Register of Historic Places. Insufficient data are available for 38 of the sites to determine eligibility, and the remaining 5 are not considered by their recorders to be eligible.

Three previously recorded archaeological sites are located within 0.5 mile from the proposed transmission line route to the Anthony pump station. This includes a lithic scatter, a ceramic scatter, and a lithic/ceramic scatter. None of these sites have been evaluated for significance. Other sites may exist within and near the proposed ROW.

Inspection of the results of previous cultural resource inventories, site settlement patterns described in regional syntheses, and topographic maps have permitted the identification of high, medium, and low site sensitivity zones (Reed 1984). It should be pointed out that the size and nature of the data base requires that these zones be utilized with caution. Seventy percent of the project area in New Mexico is classified into the low sensitivity zone, 13 percent is classified into the medium zone, and 17 percent is classified into the high sensitivity zone. High sensitivity was designated at areas of projected high prehistoric or historic use, such as along mountain passes, terraces overlooking playas, the Rio Grande floodplain, and the benches and terraces overlooking the Rio Grande.

Areas placed in the medium site sensitivity zone represent areas where some sites, such as non-structural artifact scatters, may be located in moderate numbers. Low hills overlooking broad flatlands and areas near major intermittent streams are placed in this category. Areas placed in the low site sensitivity zone have few previously recorded sites located along their extent and are generally very flat and featureless. Comparatively few sites are expected in this zone.

Texas. Of the 182 cultural resource locations previously recorded within 0.5 mile of the proposed Celeron/All American pipeline in Texas, 5 would be directly within the proposed pipeline route. The previously recorded sites fall into 11 site types: small camp, large camp, hamlet, small village, medium village, large village, caves and rock shelters, quarries, rock art, isolates, and unknown.

Researchers in the study area have generally recognized recurring associations of artifact and feature types that appear to indicate analytically useful distinctions between sites. The types presented here essentially replicate the major categories that have been thus defined. The principal source of the typology is the recent work on Maneuver Areas 1 and 2 on Fort Bliss where the majority of the sites have been identified (Whalen 1977, 1978). Most previously recorded sites are located in El Paso County on the Fort Bliss and Nation East Well USGS topographic maps. This reflects the general lack of systematic archaeological field survey along other portions of the proposed pipeline. The majority of previously recorded archaeological sites (131) are small camps. These range in size from 0.025 to 1.25 acres and contain small quantities of flaked stone, occasional groundstone and projectile points, rare ceramics, and no non-utilitarian items; one or more small hearths are frequently present.

The 8 large camp sites recorded range in area from 1.25 to 12.5 acres and contain low densities of flaked stone and ceramics, occasional projectile points, and no non-utilitarian objects. As many as 100 hearths may be present on these sites along with roasting pits or ring-middens.

Hamlets range in size from 1.25 to 3.75 acres and contain light densities of ceramics, abundant flaked and ground stone, and a number of hearths; 19 were identified near the project area.

Small villages range in size from 1.25 to 8.75 acres containing similar items to that found in hamlets, with the addition of occasional non-utilitarian objects such as shell ornaments; 15 were identified. Two medium villages were identified; these range in size from 8.75 to 15 acres and contain a full range of artifact types. No large villages were identified along the proposed pipeline route. Those are similar to medium villages, but range in size from 15 to 40 acres. In addition, two quarry sites, one rock art site, and two historic sites were located near the project.

Intensive archaeological field surveys from the Texas/New Mexico border to the eastern boundary of Fort Bliss cover approximately the first 20 miles of the proposed route in El Paso County. The extremely small number of sites recorded for the rest of the route reflects the minimal amount of systematic field work done in the project area, rather than the absence of resources. The abundance of information for El Paso County is probably a more accurate measure of the likely density of sites elsewhere. The disproportionate amount of data on this segment of the route is the result of the active work of the El Paso Archaeological Society and of the first stage of a detailed inventory of cultural resources on Fort Bliss performed in compliance with Executive Order 11593.

Only one site along the pipeline route in Texas, 41EP2 (Hueco Tanks State Park), is located within a National Register District. Sites on

Fort Bliss, however, are to be evaluated for eligibility on a case-by-case basis depending upon development projects or uses by the Fort. Thus, at this time insufficient information is available. Four sites on Fort Bliss and two elsewhere are located directly within the proposed pipeline route.

Prediction of site locations from the Texas-New Mexico border to the eastern boundary of Fort Bliss is not an issue; with the exception of a probable under-representation of small camps on Maneuver Area II, all surface cultural remains have been recorded in this area. Subsurface sites, some of which have no surface indications, are known to exist in the alluvial fans extending from the Franklin and Hueco Mountains in this region, but there is no basis at present for predicting the specific locations.

For the rest of the route, so little data are available that no good basis for predicting specific site locations exists. Very general zones where sites are likely to occur can be outlined, but such an outline cannot provide the basis for any detailed management decisions (Bamforth 1984).

Whalen (1977, 1978) notes a common association of sites with playa lakes and that concentrations of roasting pits and associated habitation areas tend to occur at the lower ecotone of mountain and foothill zones. In the Guadalupe Mountains sites containing as many as 100 roasting pits are found on relatively flat ridges in the foothills and lower mountain slopes.

Areas of sand dunes in west Texas typically contain dense concentrations of sites; such regions are found in the study area west of the Guadalupe Mountains and in the Monahans area. Finally, in any arid environment access to water is a key to human occupation. Permanent water sources are therefore likely to be highly associated with prehistoric sites. Cultural resource sensitivities are thus moderate to high along drainages, washes, and physiographic transition zones.

3.2.12 Visual Resources

The Existing Visual Conditions (EVC) from California to Texas were inventoried for above-ground pumping/heating/delivery stations, pipeline crossing sites at major rivers/aqueducts; and underground pipeline corridors in the LPNF in western Santa Barbara County. Areas of high scenic value are generally in Santa Barbara County and are of particular concern within the LPNF. From the Cuyama Valley to Emidio, (Celeron/All American and Getty) California and the route from Emidio to McCamey, Texas (Celeron/ All American), the existing visual environment is of less concern due to existing visual intrusions (highways, overhead utilities, agricultural fields, railroads, and existing pipelines) and the lower scenic value of extensive flat, featureless areas. The existing visual environment along the Celeron/All American route from eastern California to western Texas has been described in detail in the Sohio DEIS (BLM 1976 pp. 2-675 through 676).

Segments of the landscape of relatively high scenic value within the regions traversed by the proposed pipeline systems would be areas of considerable landform relief, colorful rock outcroppings, mosaics of diverse plant communities, few man-made intrusions, or perennial water features. Much of the existing and proposed pipeline ROW between Emidio and McCamey (Celeron/All American) parallels existing pipelines and traverses extensive, flat, featureless areas with uniform, monotonous desert brushland or grassland vegetation. Judgements of visual sensitivity involve consideration of people's uses of and concerns for maintenance of scenic quality and open space. Along the the proposed pipeline ROW, examples of visual sensitivity would be areas visible from scenic highways or tourist routes, wilderness or primitive areas; designated and developed parks and recreation areas, resort, retirement or second-home communities, recreational water bodies; and areas experiencing considerable backcountry, recreational vehicle, or camping use. Much of the proposed pipeline ROW traverses areas of relatively low visual sensitivity (i.e., BLM seldom seen zones).

Table 3-28 defines visual conditions used in this EIR/EIS and compares EVC types with BLM and Forest Service terminology. Table 3-29 displays the sites or above-ground facilities selected for study, EVC type, narrative description of EVC, and the location from which the facility would be seen, for the segment from Las Flores to Emidio (Celeron and Getty). Table 3-30 displays similar information for the pipeline ROW through the LPNF and Appendix E contains additional information concerning existing visual conditions within the Forest. Table 3-31 has similar data for facilities on the segment from Emidio to Blythe (All American), and Table 3-32 covers Blythe to McCamey (All American).

Electric transmission lines to pump stations would parallel the proposed or existing pipelines to the extent possible. Transmission lines to the Sisquoc pump station would parallel the proposed pipeline or the Santa Maria Canyon Alternative across farmland and rolling grazing land (EVC = III). A line to the Tejon pump station would parallel the proposed pipeline across the southern San Joaquin Valley which is dominated by existing agriculture, roads, and power lines (EVC = V). The transmission line to the Cadiz tank farm would parallel the existing Four-Corners Pipeline and existing power lines across a nearby flat desert landscape for its total length (EVC = III).

3.2.13 Noise

Describing the environment potentially affected by noise emissions of the Celeron/All American and Getty proposals requires identification of physical characteristics of noise in the area of the proposed corridors and legislative sanctions that define limits of project-related noise. Legislative sanctions include state or local plans or regulations addressing noise standards. Physical characteristics include noise-sensitive receptors as an indicator of both general and specific noise sensitivity, terrain features, and existing noise levels together with major existing sources. Each of these will be discussed by segment of the corridor. Ambient noise levels for most of the corridor were not measured specifically for this

TABLE 3-28

DEFINITIONS OF VISUAL CONDITION TYPES AND COMPARISON OF BLM AND FOREST SERVICE TERMINOLOGY

Visual Condition (Existing & Future)	Existing & Future Visual Conditions Names	Narrative Description	Similar to BLM Visual Management Class	Similar to FS Visual Quality Objective
Type I	Untouched Landscapes	In wildland landscapes, areas in which only ecological change has taken place except for trails needed for access. They appear to be untouched by human activities	I	Preservation
Type II	Unnoticed Alterations	In wildland, agricultural or residential-use landscapes, areas in which changes in the landscapes are not visually evident to the average person unless pointed out. The changes appear to be unnoticed.	II	Retention
Type III	Minor Visual Disturbances	In wildland, agricultural or residential-use landscapes, areas in which changes in the landscape are noticed by the average person but they do not attract attention. The natural appearance of the landscape still remains dominant. The changes appear to be minor disturbances	III	Partial Retention
Type IV	Visual Disturbances	In wildland, agricultural, industrial or urbanized landscapes, areas in which changes in the landscape are easily noticed by the average person and may attract some attention. The changes appear to be disturbances but resemble natural patterns.	IV	Modification
Type V	Major Visual Disturbances	In wildland, agricultural, industrial or urbanized landscapes, areas in which changes in the landscape are strong and would be obvious to the average person. These changes stand out as a dominating impression of the landscape. Yet in wildland landscapes the changes are shaped so that they might resemble natural patterns when viewed from 3 or more miles distance.	IV	Maximum Modification
Type VI	Drastic Visual Disturbances	In wildland, agricultural, industrial or urbanized landscapes, areas in which changes in the landscape are in glaring contrast to the natural appearance. In wildland landscapes, almost all people would be displeased with the effect. The changes appear to be drastic disturbances. In agricultural, industrial or urbanized areas, these changes represent the strongest human domination of the landscape.	V	Unacceptable Modification

Sources: USDA Forest Service Manual 2383.4-3; BLM 1980d; and California Resources Agency 1979.

TABLE 3-29

EXISTING VISUAL CONDITIONS

LAS FLORES TO EMIDIO

ABOVE-GROUND FACILITIES

Site or Facility	Existing Visual Condition	Description	Visible From
Celeron/All American: Las Flores Pump Station	II	Site is a grass-covered hillside in Cañada del Corral, adjacent to an existing Exxon facility	Aircraft approaching Santa Barbara Airport and seldom used road up Cañada del Corral. Not visible from US 101
Celeron/All American and Getty: Gaviota Pump Station	II	Grass-covered marine terrace adjacent to existing Getty facility which is screened from view by masses of trees and shrubs	US 101, Gaviota Store, and Restaurant
Celeron/All American: Santa Ynez River Crossing	V	Shrub-lined river meandering through broad, flat valley which is intensively cultivated	US 101, and Buellton
Getty: Santa Ynez River Crossing	V	Shrub-lined river meandering through broad, flat valley which is intensively cultivated	US 101, and Buellton
Celeron/All American: Sisquoc Pump Station	II	Grassy plain framed by two low grassy ridges	Foxen Canyon Road and nearby ranch house
Getty: Sisquoc Pump Station	II	Small, grassy flat near the confluence of the Sisquoc River and Round Corral Canyon	Not visible from any major travel routes, use areas, or water bodies
Celeron/All American and Getty: Cuyama River Crossing	IV	Broad, flat Cuyama Valley with agricultural and pastoral fields	Highway 166 and nearby ranch houses

TABLE 3-29 (CONTINUED)

Site or Facility	Existing Visual Condition	Description	Visible From
Getty: Cuyama Pump Station	III	Broad, flat Cuyama Valley with agricultural and pastoral fields	Highway 166 and nearby ranch houses
Celeron/All American and Getty: California Aqueduct Crossing	V	Aqueduct is a large, concrete-lined waterway in the flat, intensively developed agricultural fields of the San Joaquin Valley.	Highway 166
Celeron/All American: Emidio Delivery Station	VI	Adjacent to existing tank farm and pumping station. No topographic or vegetative screening. Adjacent to intensive agricultural fields	Highway 166
Getty: Emidio Delivery Station	VI	The existing facility described above	Highway 166

Source: ACT

TABLE 3-30

EXISTING VISUAL CONDITION PIPELINE RIGHT-OF-WAY ON LOS PADRES NATIONAL FOREST

Site or Facility	Existing Visual Condition	Acres Disturbed: Celeron/ All American	Acres Disturbed: Getty	Description	Visible From
La Brea Canyon (Celeron/All American and Getty)	III	4.82	4.24	Narrow canyon bottom with one-lane gravel road, mature sycamore and live oak trees, and a park-like, small scale character.	La Brea Canyon Road
	IV	25.37	12.69		
Ridgetop between Bear and La Brea Canyons (Celeron/All American and Getty)	II	2.53	0	Fuel break and trail on ridgetop.	La Brea Canyon Road and various low-use trails
	III	11.14	0		
	IV	14.46	0		
	V	6.43	0		
	I	33.39	1.04	Brush-covered, undeveloped ridgetop.	Various low-use trails
North Fork La Brea Creek and Smith Canyon (Getty)	III	0	10.17	Narrow canyon bottom with one-lane gravel road, and fuel break on adjacent ridge.	La Brea Canyon Road, Jesse and Wagon Flat Campgrounds, and Smith Canyon Fuelbreak road
	IV	0	16.93		
	V	0	4.53		
Treplett Mountain Area (Celeron/All American and Getty)	V	11.25	5.05	Fuel break and road on ridgetop on south flank of Treplett Mtn.	Forest Service Road 11N04
	V	33.62	16.82	Fuel break and road on Treplett Mtn.	Sierra Madre Road and Miranda Pine Campground
	V	12.51	6.25	Fuel break and jeep trail on ridgetop on north flank of Treplett Mtn.	Sierra Madre Road, Pine Camp and Miranda Pine Campground
Miranda Pine Mountain Area (Celeron/All American and Getty)	V	3.67	1.84	Fuel break and road on ridgetop on south flank of Miranda Pine Mountain, and Sierra Madre Road.	Sierra Madre Road, Miranda Pine Campground and Pine Camp.
	II	14.58	7.29	Fuel break and trail on ridgetop through uniform brush field on Sierra Madre Front.	Highway 166 and Cuyama Valley
	III	10.57	5.29		
		184.34	92.14		

Source: ACT

TABLE 3-31

EXISTING VISUAL CONDITIONS

EMIDIO TO BLYTHE

Site or Facility	Existing Visual Condition	Description	Visible From
Emidio Heating/ Pumping Station	VI	Adjacent to existing tank farm and pumping station. No topographic or vegetative screening. Adjacent to intensive agricultural fields.	Highway 166
Tejon Pump Station	II	A site in the foothills of the Tehachapi Mountains near Cedar Canyon.	Not visible from any sensitive area
Twelve Gauge Lake Pump Station	IV	Existing pipeline ROW, overhead wires, nearby homestead in California Desert.	Highway 58
Mojave River Crossing	VI	Shrub-lined river situated in a broad, gravel wash, adjacent to U.S. Marine Depot facility.	Interstate 40
Cadiz Tank Farm, Heating/Pumping Station	IV	On flat floor of Cadiz Valley with existing road, railroad and overhead utility lines.	US 66
Colorado River Crossing	V	At the south edge of Blythe, near a campground, residences, light industrial facilities, a levee, an overhead suspension bridge for a pipeline, and Interstate 10 and its attendant bridge over the Colorado River.	Interstate 10 bridge; local roads

Source: ACT

TABLE 3-32

EXISTING VISUAL CONDITIONS

BLYTHE TO McCAMEY

Site or Facility	Existing Visual Condition	Description	Visible From
La Paz Heating/ Pumping Station	IV	In the foothills of the Dome Mountains adjacent to the La Paz Arroyo, with an existing pipeline corridor, jeep trails and several small mines.	Interstate 10
Gila River Crossing	V	In the broad valley of the Gila River, with existing pipeline bridges, US 80 bridge, quarries and Gillespie Dam.	US 80 and the Gillespie Dam in the Arlington State Wildlife Area.
Gila Heating/ Pumping Station	IV	On a flat desert landscape with brush cover, with an existing pipe-line corridor and nearby cultivated fields.	US 80
Coolidge Heating/ Pumping Station	IV	On a flat, brush-covered, desert plain with existing roads and pipeline corridors.	Not visible from any road. Visible from aircraft approaching the Coolidge-Florence Municpal Airport.
Tom Mix Pump Station	III	On a flat desert plain at the base of some low, unnamed hills, with existing pipeline corridor and roads.	US 80/89
San Pedro River Crossings	III	A broad, gravel wash framed by desert mountains and canyons, with existing roads on both sides of the river.	Not visible from any major travel routes or use areas.

TABLE 3-32 (CONTINUED)

Site or Facility	Existing Visual Condition	Description	Visible From
Hot Springs Heating/ Pumping Station	IV	On a flat desert terrace at the base of the Winchester Mountains, with an existing pipeline corridor and roads.	Hot Springs Canyon Road leading to Hooker Hot Springs.
Lordsburg Heating/ Pumping Station	V	A vast, inclined, brush-covered desert plain with numerous dry washes running into the Burro Cienaga to the southwest, with an existing pipeline corridor and road.	Interstate 10
Rio Grande River Crossing	V	In the broad Rio Grande floodplain, with existing overhead pipeline crossings, a highway bridge, and roads and agricultural fields on both river banks.	Berino Road
Anthony Heating/ Pumping Station	II	In the desert foothills of North Anthony's Nose Mountains with existing pipeline corridors, roads, overhead utility corridors, and city streets of Anthony, N.M.	Site is not visible because of topographic screening.
Salt Flats Heating/ Pumping Station	IV	On a desert salt flat, with an existing pipeline corridor, roads and a nearby borrow pit.	US 62/180
Delaware River Crossing	IV	In the Basin and Range Province of southwestern Texas, with existing pipelines and roads.	Not visible from any major travel routes or use areas.

TABLE 3-32 (CONTINUED)

Site or Facility	Existing Visual Condition	Description	Visible From
Pecos River Crossing	V	In the broad floodplain of the Pecos River, with existing pipeline crossings, roads, overhead utilities, a gauging station, and nearby Mason Station tank farm.	Not visible from any major travel routes or use areas.

Source: ACT

analysis but reasonable estimates, sufficient for the purpose of this analysis, can be made using the following table.

Location	Persons/Square Mile	L_{dn} (dB)
Rural-Undeveloped	20	35
Rural-Partially Developed	60	40
Quiet Suburban	200	45
Normal Suburban	600	50
Urban	2,000	55
Noisy Urban	6,000	60
Very Noisy Urban	20,000	65

Source: National Research Council 1977

3.2.13.1 Las Flores to Emidio. Neither the Federal government nor the State of California has specific regulations for community noise that are applicable to the Celeron/All American and Getty proposals. The state does require, however, that counties and cities prepare noise elements as part of their mandated general plans [California Government Code ss. 65302 (g)]. The state has also issued guidelines for preparation of the noise elements indicating the relative acceptability of a range of community noise exposure levels for major land use categories (Appendix F). The guidelines indicate that an exterior noise exposure up to 60 decibels (dB) exterior day-night average sound level (L_{dn}) or Community Noise Equivalent Level (CNEL) is "normally acceptable" for low density residential, which is the most restrictive land use category specified.

Santa Barbara County's Noise Element recommends an L_{dn} of 65 dBA (A-weighted) as the maximum compatible with noise-sensitive uses. Specific standards are not cited in the county zoning ordinances for the zoning districts that apply to the proposed pipeline corridors.

San Luis Obispo County has an adopted ordinance (County Code ss. 22.06.040) establishing exterior noise standards but exempts uses that are outside of, and would not adversely affect, urban or village reserves.

Kern County has no noise ordinances but may require an accoustical study on a project-specific basis (James 1984, personal communucation).

The few noise-sensitive receptors along the proposed corridors from Las Flores to Emidio are tabulated in Section 3.2.9 (Table 3-23). Among the receptors listed, only those near a proposed pump station could be affected by project-related noise beyond the brief construction period. The Vista del Mar Union School and associated residences are the only identified noise-sensitive receptors near a pump station site (Gaviota) on the Las Flores to Emidio corridor segment.

Terrain is highly varied along the corridor. The Gaviota pump station would be located on moderately sloping ground at approximately the same elevation as the school with no intervening terrain barriers.

Ambient noise levels along the Las Flores to Emidio corridor are as varied as the land use and terrain. The Santa Barbara County Noise Element (1979) estimated noise contours for major highway corridors and measured noise levels at selected sites in the county. An L_{dn} level of 60 dBA or greater was estimated to extend 250 ft on both sides of US 101 for the highway segment paralleling the Celeron/All American and Getty proposals. Measurements for two sites near the proposed corridors, both located in Buellton, indicated ambient L_{dn} levels of 50 and 56 dBA. Ambient levels for the remainder of the corridor have not been measured but can be estimated based on population densities using the table in the introduction to Section 3.2.13. The largely rural character of corridors suggests ambient noise levels ranging from 35 dBA to 45 dBA (L_{dn}).

3.2.13.2 Emidio to Blythe. Federal, state, and Kern County guidelines discussed above also apply to the Emidio to Blythe corridor segments. Neither San Bernardino County nor Riverside County has adopted a noise ordinance, but Riverside County's Noise Element recommends an outdoor L_{dn} level of 60 dBA for residential areas.

Noise-sensitive receptors are listed in Table 3-26 (Section 3.2.9). None are located near proposed pump or heater station sites. Terrain varies from nearly flat desert to mountainous, with pump stations typically located on flat or gently rolling terrain.

Ambient noise levels for much of this corridor would be in the rural range as defined on the above table. Principal exceptions would be at Barstow and Blythe, where the corridor crosses suburban residential type areas, and along I-40, where L_{dn} levels could reach 60 dBA to 70 dBA or more.

3.2.13.3 Blythe to McCamey. There are no noise statutes or ordinances in effect at either the state or county level along All American's proposed corridor in Arizona, New Mexico, or Texas.

Most of the land crossed by the pipeline corridor for this segment is grazing or desert land with few noise-sensitive uses nearby (see Table 3-26). No sensitive receptors have been identified near proposed pump or heater stations sites. Terrain varies from flat to mountainous with pump stations typically located on flat to rolling sites.

Ambient noise levels for most of the Blythe to McCamey corridor segment would be in the rural range defined on the above table. Minor but notable exceptions would occur in limited areas where the corridor is near I-10; towns such as Lordsburg and Deming, New Mexico; and on cultivated agricultural land during high activity seasons.

3.3 Santa Maria Canyon Alternative

3.3.1 Air Quality

Existing air quality conditions along the Santa Maria Canyon Alternative would be the same as described for the Celeron/All American and Getty proposals. This alternative would pass within 2 miles of the north coast nonattainment area for TSP.

3.3.2 Geology

The Santa Maria Canyon Alternative route crosses sheared, fractured, and altered rock of the Franciscan Assemblage above California State Highway 166 for about 5 miles north of the Buckhorn Canyon Road intersection. Pods of serpentine, which can range from very hard competent rock to incompetent, clay-like material, occur locally in this reach. The other rock units traversed are generally similar to those on the Celeron/All American and Getty routes through La Brea Canyon (Hall 1978). As shown on Map 1-2, portions of this alternate route, particularly in the general vicinity of Pine Canyon, are characterized by landsliding in the Franciscan and some adjacent rock units. The Santa Maria route crosses the Quaternary age Rinconada and South Cuyama faults. As indicated on Table 3-3, neither of these faults exhibit documented evidence of movement during Holocene time. The discussions of seismicity, paleontology, and unique geologic features for the Celeron/All American and Getty proposed routes are generally applicable to this alternative. Small active commercial quarries are located adjacent to the Santa Maria route at the mouth of Suey Canyon and at the mouth of Pine Canyon. No other operating or inactive mining operations or mineral resources are present.

3.3.3 Soils

The major soils intersected by this alternative route from Foxen Canyon to the LPNF boundary occur on mountain uplands and dissected terraces. The Chamise, Santa Lucia, Lopez, and Gazos soils dominate this area (Shipman 1972). The Chamise series is characterized by deep, well drained shaly loams. These generally occupy slopes of 15 to 45 percent and are highly erodible. The Santa Lucia and Lopez soils are shallow, well to somewhat excessively drained, shaly clay loams. They generally occur on very steep (up to 75 percent) slopes and are highly erodible. The Gazos series is typified by moderately deep, well drained clay loams on steep upland hills. They are prone to accelerated erosion and landslides. The soils along the Sisquoc River and Suey Canyon occupy low dissected terraces and alluvial fans. The Pleasanton and the Elder series represent these deep, well drained, cobbly sandy loam soils which occur on gentle to moderately steep slopes.

The dominant soils along this route within the LPNF occur on steep (20 to 60 percent slopes) mountain uplands and hillsides. They are typically moderately deep to deep, well drained, and moderately coarse to moderately fine-textured. Representative soils include the Modesto, Millerton, and Rincon series which are characterized by very erodible soils that are often prone to slumping (O'Hare el al. 1984). The Yorba and Aqua Dulce soils that also occur in these steep mountainous uplands are excessively drained and contain high percentages of coarse fragments. Included are areas of the Millsholm series that are typified by shallow, well drained, medium to moderately fine-textured soils. They are very erodible and contain areas prone to slumping.

The western portion of the Cuyama Valley is characterized by gently sloping alluvial fans and floodplains. The soils intersected by the pipeline route are generally deep, well drained, and moderately coarse-textured. Representative soils are the Sorrento and Mocho series (Shipman 1972). Included in this area are small units of Pleasanton soils that are deep, well drained, cobbly sandy loams. Small pockets of riverwash, dominated by sand, gravels, and cobblestones, occur within the active channels of the Cuyama River.

3.3.4 Surface Water

The Santa Maria Canyon Alternative would be similar to the Celeron/All American and Getty proposals except the pipeline would cross Tepusquet Creek instead of following La Brea Creek. Flows gaged about 1.1 miles up from the mouth of Tepsuquet Creek averaged 1.57 cfs for 38 years of record through September 1981. The maximum discharge recorded during that period was 788 cfs on December 6, 1966, and there have been periods with no flow in some years. The channel bed material is sand and gravel averaging less than 1.5 inches in diameter in the lower sections. In the upper reaches of the stream, bedrock is exposed in the channel. At the proposed pipeline crossing, the channel bed material is composed of sand and gravel with an average diameter of 1.5 inches.

3.3.5 Groundwater

The groundwater in the alluvium of Tepusquet Canyon is used by local residents for domestic and agricultural uses. The pipeline crosses Tepusquet Creek near its confluence with the Sisquoc River. This crossing is considered a sensitive area because of potential impact to the Sisquoc River alluvium; however, most of Tepusquet Canyon would be unaffected because of its location upgradient from the crossing.

The additional length of pipeline route through Cuyama Valley is approximately 7 miles for the Santa Maria Canyon Alternative. This would not add to the length of sensitive aquifers affected because in this part of Cuyama Valley, the alluvial fill is absent and the river is cut into consolidated bedrock which is considered to be non-water bearing (Upson and Worts 1951).

3.3.6 Aquatic Biology

No published information is available concerning aquatic communities in Tepusquet Creek. Based on habitat characteristics in the creek, probable species include arroyo chub and threespine stickleback. Since the creek is quite small (widths range from 3 to 6 ft) and dominated by shallow riffles, no rainbow trout are expected to be present.

3.3.7 Terrestrial Biology

The Santa Maria Canyon Alternative route would cross primarily oak woodlands (27 percent) and affect 1.6 miles of riparian woodlands (5 percent) along its 38-mile length (Table 3-33). Oak woodlands occur primarily on private lands in Suey Canyon. The high percentage of woodlands, grasslands, and scrubland reflect the private land ownership and use of the land crossed by this alternative. Much of the route crosses annual grasslands and oak woodland-grasslands used to pasture or graze livestock. The route along Highway 166 would affect primarily mixed chaparral before dropping into the Cuyama Valley.

Much of the oak woodland near the Rockfront Ranch is considered to be important wild turkey habitat. This site is being considered for future turkey reintroductions. Several turkeys were released in January 1982 and appear to still be in the area (G. Smith 1984, personal communication).

Prairie falcon and golden eagle nest near the pipeline route along the old Highway 166 road bed (see Map 1-2). No other threatened, endangered, or rare species are known to occur along this segment.

3.3.8 Socioeconomics

The affected environment would be the same as the Celeron/All American and Getty proposals.

3.3.9 Land Use and Recreation

The Santa Maria Canyon Alternative splits off from the Celeron route near the crossing of Sisquoc Ranch and adjacent cropland. The route then enters Tepusquet Canyon and follows the wooded ridge top to the west of the canyon bottom. The ROW would then ascend undeveloped range and woodland in Suey Canyon and descend to Highway 166 and the Cuyama River. It generally parallels the highway and passes through 4.5 miles of the LPNF. Near the forest boundary, it crosses the Cuyama River three times before maintaining a course on the north bank to the junction with the applicants' proposed route from La Brea Canyon.

A description of land use regulations for Santa Barbara County was discussed under the Celeron/All American and Getty proposals. Recreational use along the route is limited to sections of the LPNF which receive very limited hunting use. The Tepusquet Road and a side road, the Colson Canyon Road, are the primary access routes for recreationists into the La Brea Canyon recreation corridor (Green 1984, personal communication). No FPAs would be crossed by this route.

3.3.10 Transportation

State Highway 166 is the only major roadway to be intersected by the proposed pipelines in the Santa Maria Canyon Alternative route (see Table 3-34). The pipelines would cross Highway 166 twice in the Cuyama

TABLE 3-33

VEGETATION COVER TYPES AFFECTED BY THE SANTA MARIA CANYON, DESERT PLAN, AND BRENDA ALTERNATIVE ROUTES

(In Percent with Miles in Parentheses)

Alternative/County	Chaparral	Coastal Sage	Irrigated Agriculture	Dryland Agriculture	Desert Scrubland	Desert[1] Grassland	Riparian	Woodland	Disturbed	Total (linear miles)
Santa Maria Canyon Alternative										
Santa Barbara County	25(8.1)	10(3.2)	3(0.9)	0	2(0.6)	23(7.5)	5(1.6)	32(10.4)	<1(0.2)	32.5
San Luis Obispo County	0	0	0	0	32(1.9)	65(3.9)	0	3(0.2)	0	6.0
Kern County	0	0	0	0	0	0	0	0	0	0
Desert Plan Alternative										
San Bernardino County	0	0	0	0	100(194)	0	0	0	0	194
Riverside County	0	0	0	0	0	0	0	0	0	0
Brenda Alternative										
Yuma County	0	0	0	0	100(63)	0	0	0	0	63

Source: ERT

[1]Includes dune communities and ironwood washes.

TABLE 3-34

PIPELINE ROAD CROSSINGS FOR THE PROPOSED ALTERNATIVE ROUTES

Santa Maria Canyon Alternative

Santa Barbara County, CA
Tepusquet Road (2)[1]

San Luis Obispo County, CA
State 166 (2)

Desert Plan Utility Corridor Alternative

Riverside County, CA
State 62
State 177
Interstate 10 (2)
U.S. 95

Brenda Alternative

Yuma County, AZ
U.S. 95

Source: ERT

[1]Numbers in parenthesis refer to the number of times a road would be crossed by the pipeline.

Valley in San Luis Obispo County. Tepusquet Road would be crossed by the pipelines at the Tepusquet Canyon entrance and near the intersection with Highway 166 in the Cuyama Valley (Santa Barbara County).

3.3.11 Cultural Resources

Of the 14 sites identified within 0.5 mile of the Santa Maria Canyon Alternative route, 3 are located within the pipeline ROW. These include one village site, one lithic scatter, and one site of unknown description.

Village/habitation sites indicate a wide range of subsistence and nonsubsistence activities. A village site would include primary tools, secondary tools, floral or faunal remains, and the widest range of artifactual materials for any given chronological period. A shell midden is often a component of a village site. Five villages were previously recorded within 0.5 mile from the pipeline route. One campsite was previously recorded near the proposed route.

One pithouse (a single occupation) and one burial site were previously recorded within 0.5 mile of the route; these locations have been identified as prehistoric areas of high sensitivity.

No sites along this alternative route are listed on the National Register. The majority of sites, both within and near the route, require additional evaluation to determine their eligibility for inclusion in the National Register or, on private lands, to determine their significance using criteria as stated in Appendix K of CEQA.

A 100-percent pedestrian survey was also conducted for cultural resources along 4.5 miles of the Santa Maria Canyon Alternative route within the LPNF. This survey identified no new cultural resource sites; however, approximately 0.25 mile of the route could not be surveyed due to the steepness of the terrain and thickness of the vegetation. If this alternative is approved, this area would be surveyed following vegetation removal and prior to earth movement.

The entire length of the Santa Maria Canyon Alternative is assigned high cultural resource sensitivity due to potential for direct and indirect impacts.

3.3.12 Visual Resources

The Santa Maria Canyon Alternative would traverse near-level farmland along the Sisquoc River and Tepusquet Creek, rolling grassland and oak woodland along the ridge west of Tepusquet Canyon, and mixed grassland/oak woodland/chaparral along 4.5 miles in LPNF, before turning east along the south side of the Cuyama River. There would be no above ground facilities located along this alternative route.

The site or area selected for study, EVC type, narrative description of EVC, and the location from which the site would be seen for the Santa Maria Canyon Alternative are presented in Table 3-35. Appendix E contains additional information concerning existing visual conditions along this alternative within the LPNF.

3.3.13 Noise

The affected environment for noise associated with the Santa Maria Canyon Alternative would be essentially the same as that described for the Las Flores to Emidio segment of the Getty and Celeron/All American corridor proposals. The key consideration is the residences scattered along the route, which would be considered sensitive receptors for noise.

3.4 Desert Plan Utility Corridor Alternative

3.4.1 Air Quality

Existing air quality conditions along the Desert Plan Alternative would be essentially the same as those described for the Mojave Desert region traversed by the Celeron/All American proposed route. This alternative would pass within 1 mile of Joshua Tree National Monument, which is a Class I area.

TABLE 3-35

EXISTING VISUAL CONDITIONS, SANTA MARIA CANYON ALTERNATIVE
PIPELINE RIGHT-OF-WAY ON LOS PADRES NATIONAL FOREST

Site or Facility	Existing Visual Condition	Acres Disturbed	Description	Visible From
On ridge top east of Cuyama River, and midslope in Cuyama River Gorge	I II III II	27.35 5.86 4.48 3.69	Flat ridgetop covered with grass and scattered oaks	Various jeep trails
			Ridgetop dissected by jeep trails	Various jeep trails
	II	1.19	Old abandoned roadbed of Highway 166	New alignment of Highway 166 and various jeep trails
	V	5.16	On the shoulder of Highway 166	Highway 166
Crossing western tip of Sierra Madre Mountain	I	1.38	Unroaded, undeveloped mountain slope covered with grass, brush, and scattered oak trees	Highway 166 and Sierra Madre Road
Crossing Sierra Madre Road	III	4.13	Gravel road in rolling landscape with grass and scattered oak trees.	Sierra Madre Road and Highway 166
Cuyama River Crossing (outside LPNF)	III	NA	Abandoned highway roadbed at west end of broad, agricultural Cuyama Valley	Highway 166
		53.24		

Source: ACT

NA = Not Applicable

3.4.2 Geology

Geologic and physiographic conditions along the Desert Plan Utility Corridor Alternative route are generally similar to those described for the proposed Celeron/All American route). The most significant physiographic/geologic features on this route are the rugged Coxcomb Mountains underlain by hard Mesozoic-age granitic and metasedimentary rocks, and the active sand dunes in Chuckwalla Valley. The discussions of seismicity and faulting and slope stability for the Mojave Desert portion of the applicants' proposed route are generally applicable to this alternative. The only potentially significant fossiliferous units crossed by the Desert Plan Alternative route would be the Danby Lake beds in Ward Valley. No unique geologic features of great scientific interest would be traversed. Mineral resource areas (as identified by the BLM 1980c) underlie the Desert Plan Alternative route as summarized on Table 3-36. Exploration to assess the potential for extraction and heap leaching of gold is occurring or proposed in the Piute-Old Woman Mountains area in the general vicinity of the route (Britton 1984, personal communication). The route also passes just east of a proposed Southern California Edison solar pond project on Danby Lake (Hayes 1984, personal communication).

3.4.3 Soils

The major soils intersected by this alternative route would be similar to those described for the Celeron/All American proposal. They occupy level to gently sloping alluvial fans, floodplains, and dry lake beds (playas) of Chuckwalla and Cadiz Valleys (BLM 1978). These soils are typical of the major soils units of the Mojave Desert.

3.4.4 Surface Water

No major rivers or streams would be crossed by this alternative.

3.4.5 Groundwater

The Desert Plan Alternative would route the pipeline through Fenner, Ward, and Chuckwalla Valleys rather than through Cadiz and Rice Valleys. All of these Mojave Desert basins are considered non-sensitive, because of depths to groundwater, poor water quality, or a low degree of groundwater use.

3.4.6 Aquatic Biology

As indicated in the California Desert Conservation Area EIS (BLM 1980a), surface water sources such as springs, seeps, and streams are rare in the California Desert. No perennial streams would be crossed by this alternative. Since water would exist in the washes and streams only after rains, aquatic organisms would mainly include invertebrates and algae that are able to colonize temporary habitats. Based on distribution maps of fish species listed as threatened and endangered in the California Desert (BLM 1980b), none occur in the proposed corridor for this alternative.

TABLE 3-36

MINERAL RESOURCE AREAS ALONG THE DESERT PLAN UTILITY CORRIDOR ALTERNATIVE WITHIN THE CALIFORNIA DESERT CONSERVATION AREA

Location	Type	Commodity	Comments
Ford Dry Lake	Energy	Geothermal	Leasable; moderate potential
Piute Mountains to Chuckwalla Valley	Energy	Uranium/thorium	Gamma-ray anomalous, potential unkown; scattered occurrences
Cadiz Summit	Non-metallic	Limestone	
Piute Mountains	Non-metallic	Limestone	
Danby Lake	Non-metallic	Sodium, potassium	Leasable; known valuable; previous production (Stephens 1984, personal communication)
Granite Pass	Non-metallic	Sand and gravel	Past production
Chuckwalla Valley	Non-metallic	Sand and gravel	Past production

Source: BLM (1980)

3.4.7 Terrestrial Biology

This 191-mile route alternative affects similar vegetation and wildlife resources as the Celeron/All American proposal. Major vegetation types include creosote scrub communities, alkali sinks, Joshua tree woodlands, and desert washes and dunes. Vegetation is described in more detail in Appendix X of the California Desert Conservation Area Final EIS (BLM 1980b). Sensitive plant communities along or near the route include a population of California ditaxis, a candidate species for listing as threatened or endangered by the U.S. Fish and Wildlife Service. The population occurs in cresote bush scrub and sandy washes about 3 miles west of Desert Center near Interstate 10. Another sensitive community, is an unusual dune thicket in the Chuckwalla Valley south of I-10 and west of Blythe. This 100-acre community occurs in an alluvial fan at the base of large dunes allowing for development of dense thickets of mesquite and ironwood trees (Foreman 1984, personal communication). The Ford Dry Lake area (6 acres) occurs along the route west of Blythe. No other unique plant communities have been identified along the route.

Sensitive wildlife resources include desert bighorn sheep, golden eagle, prairie falcon, and desert tortoise. The route would cross desert bighorn migration corridors between Old Woman Mountain and the Piute Mountains, and possibly routes near the Iron Mountains. The existing migration corridors along this route generally follow the desert floor, and no lambing areas or watering holes would be crossed. Raptors such as the golden eagle and prairie falcon nest in desert mountains throughout the region. The route crosses six golden eagle and prairie falcon foraging areas (BLM 1980b). Desert tortoise occur throughout the region and high concentrations occur in the Fenner Valley/Chemeheuvi Valleys crossed by the Desert route near the Piute Mountains. This area is designated as crucial habitat for desert tortoise.

3.4.8 Socioeconomics

The affected environmental would be the same as described for the Celeron/All American proposal.

3.4.9 Land Use and Recreation

The Desert Plan alternative route begins near Amboy, California and proceeds northeastward through the Fenner Valley following along an existing road and a 34-inch pipeline ROW. Near Camino it turns southwest and traverses the Ward Valley along a transmission line corridor to the Iron Mountain pump station. The Colorado River Aqueduct is crossed several times before the route proceeds eastward along Interstate Highway 10 to Blythe. Approximately 8 miles of mixed agricultural and urban development surrounding and within Blythe would be crossed by the route before meeting the Colorado River.

This route would be entirely within a designated utility corridor described in the BLM California Desert Conservation Area Plan (1980c).

It also is within a utility corridor recognized by San Bernardino County (1980). Other land use regulations and plans are similar to those described for the All American Proposal.

Recreational use of this corridor is limited by the existence of transmission lines and pipelines. The service roads for these facilities, however, do provide public access to large areas of the desert. Recreational use patterns would be similar to those described for the Celeron/All American proposal. The route passes primarily through land with motorized access limited to existing or approved routes of travel. The route follows an existing transmission line where it crosses the Coxcomb Mountains WSA (#328). The transmission line was set by helicopter and there are no roads in that part of the WSA. The area south of the transmission line has been recommended as not suitable for wilderness while the northern portion is recommended as suitable.

3.4.10 Transportation

Major roadways to be crossed by the pipeline following this alternate route (utility corridors H, E, and K) include State Highways 62 and 177, I-10, and US 95. Highways 62 and 177 would be intersected by the pipeline near Granite Pass in Riverside County. I-10 would be intersected at Desert Center and in the Chuckwalla Valley east of Ford Dry Lake. In Blythe, the proposed pipeline would cross US 95.

3.4.11 Cultural Resources

Of the 21 sites identified within 0.5 mile of the Desert Plan Utility Corridor alternative, 3 are located within the proposed alternative ROW. Site types include rock rings, lithic scatters, petroglyphs (two located within the ROW), trails, quarries, habitations/villages, campsites, milling stations, historic sites, and isolates. One historic site, identified as Patton's World War II camp, has been nominated to the National Register; final determination is pending. Six other sites, two within the ROW, are considered by the recorders to be eligible for inclusion. The majority of previously recorded sites, both within and near the proposed alternative route, require additional evaluation to determine their eligibility for inclusion in the National Register, or, on private land, to determine their significance using criteria as stated in CEQA Appendix K.

No additional sites were recorded during field survey of 16, 0.5-mile sample units (5 percent) along the alternative route.

Based upon the locations of previously recorded sites, their distributions and other archaeological information, portions of the alternative route were ranked regarding cultural resource sensitivities. Areas of moderate to high sensitivity include the bases of the Bristol and Marble Mountains; the pass between the Old Women and Piute Mountains; the shoreline of Danby Dry Lake; and the bases of Iron, Granite, Coxcomb, and Chuckwalla Mountains. Other areas are considered of low to moderate cultural resource sensitivity but occasional significant resources could occur.

3.4.12 Visual Resources

The site or facility selected for study, EVC type, narrative description of EVC, and the location from which the facility would be seen for the Desert Plan Utility Corridor Alternative are presented below. The transmission line to the Essex pump station would follow the same route as the line described for the Cadiz pump station and would be approximately 13 miles in length.

3.4.13 Noise

No noise-sensitive receptors have been identified near the corridor for the Desert Plan Alternative. Consequently, noise would not be a concern for this alternative.

EXISTING VISUAL CONDITIONS

Site or Facility	Existing Visual Condition	Description	Visible From
Essex Pumping/Heating Station and Tank Farm	IV	Broad, flat, brush-covered desert plain with existing roads, pipelines, valve/pumphouse, and overhead utility corridors	US 66

3.5 Brenda Alternative

3.5.1 Air Quality

Existing air quality conditions along the Brenda Alternative would be essentially the same as those described for the proposed Celeron/All American route.

3.5.2 Geology

The Brenda Alternative route in Arizona traverses valley/basin alluvium and alluvial fans similiar to those described for the Celeron/All American proposed route. Between Quartzite and Brenda the route crosses a topographically subdued to pedimented portion of the Plumosa Mountains. The discussion of other geologic topics for All American's proposed route are generally applicable to this alternative. More detailed geologic information is available in the Palo Verde-Devers ES (BLM 1978 p. 2-6, 7) and supporting documents (Southern California Edison 1977 p. 2.1-19, 20 and Section A-1, Appendix A).

3.5.3 Soils

The major soils along this alternative are comparable to those described for southwestern Arizona in Section 3.2.3.

3.5.4 Surface Water

No other major rivers or streams would be crossed by this alternative.

3.5.5 Groundwater

The Brenda Alternative is similar to the Celeron/All American proposal since both routes cross La Posa and Ranegras Plains. Ranegras is not considered a sensitive groundwater basin. La Posa includes a moderate degree of development of shallow (<100 ft) groundwater for domestic uses near Quartzite, Arizona. This alternative would route the pipeline through the more developed area of La Posa Plain.

3.5.6 Aquatic Biology

No perennial streams would be crossed by the Brenda Alternative. Invertebrates and algae may exist in intermittent streams for a short period after rains; however, no fish are expected to occur in these streams.

3.5.7 Terrestrial Biology

Vegetation types along the Brenda Alternative route would be similar to those along the Celeron/All American proposed route. The 63-mile route crosses desert scrubland communities consisting of creosote-bursage flats, creosote scrub, palo verde, saguaro transitional areas on upper bajadas or foothills, and palo verde-saguaro communities in the mountains (BLM/NRC 1978). About 70 percent of the route would follow existing disturbance (primarily pipeline ROW) parallel to I-10. No federally or state listed protected plant species were reported along this segment of the Brenda route by BLM (BLM/NRC 1978) or FWS (see Appendix B).

Wildlife species found along the Brenda route would be similar to those described for the Celeron/All American proposal as typical of Upland Sonoran Desert. Sensitive wildlife resources along this alternative route include desert bighorn migration corridors. Lambing areas and associated watering holes occur in rocky habitats at elevations above the route. North of I-10, the route would come within one-quarter mile of the Lazarus tank lambing grounds. Other species possibly occurring along the route include American peregrine falcon, Yuman mountain lion, desert tortoise, and gila monster (see Appendix B).

3.5.8 Socioeconomics

The affected environment would be nearly the same as described for the Celeron/All American proposal. Quartzsite, Arizona, which is located close to the Brenda Alternative, has a significant increase in population during the winter months. From November through April a large number of recreational vehicle campers ("snowbirds") take up residence in the area. Up to 50,000 immigrants have been estimated in previous years.

3.5.9 Land Use and Recreation

The Brenda Alternative diverges from the proposed route near the La Paz pump station and parallels an existing pipeline and I-10. It has a mixture of BLM, state, and private land ownership. Principal land uses are grazing and recreation. Hunting is the principal recreational use of the area. It is accessible from old Highway 60.

This alternative avoids the Kofa NWR, and also avoids New Water Mountains WSA (#2-125) for approximately 5 miles by paralleling the north side of I-10. This WSA is managed under Interim Management Policy, which states that until Congress acts, no new permanent ROW can be established (Hanson 1984, personal communication). See Appendix D for a detailed description of the WSA.

3.5.10 Transportation

The Brenda Alternative would involve a pipeline crossing I-10 twice east of Quartzsite, Arizona. No other major roads would be affected by the pipeline with this alternative.

3.5.11 Cultural Resources

Twenty five archaeological and historic sites have been previously recorded within 0.5 mile of the Brenda Alternative including historic sites, prehistoric campsites, rock shelters, ceramic scatters, lithic scatters, ceramic and lithic scatters, trails, and rock rings/sleeping circles. Three sites are located directly within the proposed ROW. Eight sites are not considered eligible for National Register status by the recorders; one site is considered eligible for the National Register and is within a multiple resource area. The remaining 16 sites need additional evaluation.

Sensitivities within specific portions of the Brenda Alternative have been assessed based upon previous research and research potential as follows. Between Dome Rock Mountains and Tyson Wash a low to moderate level of sensitivity is assigned. Along the Palomas Mountains a low to moderate level of cultural resource sensitivity is assigned. Along the New Water Mountains a low to moderate level of sensitivity is assigned. Between the Renegras Plain and the Eagletail Mountains a lower sensitivity is likely to be found except along the Upper Bouse Wash where a moderate level of sensitivity is anticipated.

3.5.12 Visual Resources

Along the Brenda Alternative, there would be no major river crossings or above-ground facilities. Therefore, the visual environment along the Brenda Alternative was not inventoried; however, it does parallel existing pipelines and highway corridors throughout its length.

3.5.13 Noise

The affected environment for noise associated with the Brenda Alternative would be essentially the same as for the remainder of the Emidio to Blythe corridor segment of the Celeron/All American proposal except that portions of the community of Quartzsite would be near enough to the corridor to be identified as sensitive noise receptors.

3.6 McCamey to Freeport Alternative

3.6.1 Air Quality

Existing air quality data for San Antonio, Texas, is presented in Appendix A, Table A-9. San Antonio is the only major air quality monitoring location near a proposed pump station site along the McCamey to Freeport Alternative. The Seguin pump station would be located approximately 25 to 30 miles northeast of San Antonio. The only pollutants for which violations of federal and state standards were observed were O_3 (1-hour), CO (8-hour), and TSP (annual geometric mean). Only CO and TSP would be emitted by pipeline construction or pump station operation.

3.6.2 Geology

Geology and Physiography. The alternative pipeline route from McCamey to Freeport would cross two major geologic/physiographic provinces, the Edwards Plateau and the Texas (or West Gulf) Coastal Plain.

The Edwards Plateau is a relatively high, somewhat dissected plain dominantly underlain by limestones and dolomites of Cretaceous age (Wermund 1974). The density of dissections on the topographic surface increases significantly to the east as the route enters Kerr County. Drainages are often bounded by steep-sided, rocky cliffs. Steep dissections also occur east of the Pecos/Crockett County line, where the route crosses relief of up to 600 ft. In this same area, the proposed route also crosses the floodplains of Fourmile Draw and the Pecos River.

In general, elevations on the Edwards Plateau range from approximately 2,400 ft on the west and gradually decline eastward to roughly 1,300 ft in the vicinity of San Antonio. A thin veneer of soil overlies the Edwards limestone; the plateau is referred to as a "stripped plain" due to the erosion of the Tertiary materials that once overlaid it (Fenneman 1931, Thornbury 1965). Numerous small solution basins, sinkholes, and springs attest to the immature karstic nature of the plateau.

To the south and east, in the San Antonio vicinity, the Edwards Plateau is bounded by the rugged Balcones Escarpment. Topographic relief in this area is roughly 400 to 600 ft as the plateau meets the inland portion of the Gulf Coastal Plain. Several fault zones and scarps occur across the Gulf Coastal Plain. The major escarpments are the Edwards (or Balcones), Nacogdoches, and the Bordas-Oakville-Kishatchie.

The major topographic features of the inland coastal plain are controlled by erosion of the softer uplifted Tertiary and Cretaceous sedimentary rocks to form a series of lowlands. These in turn are separated by the previously mentioned escarpments, which locally form low, west-facing hills.

Toward the coast, the surface geology of the plain consists of a series of coalescing deltaic and fluvial sediments of Quaternary age. Topographically, the Gulf Coastal Plain in this area consists of five major terraces, four of Pleistocene and one of Holocene age. They are underlain by sands and gravels fining upward to silts and clays. Outer coastal features consist of broad deltaic plains, low-lying tidal marshes, and dunes (Thornbury 1965).

Faulting and Seismicity. Four major fault zones occur along the route from McCamey to Freeport; all occur within the Gulf Coastal Plain or along its northwestern boundary. From northwest to southeast, these are the Balcones, Luling, Mexia fault zones and the Karnes trough. Only the Balcones has major topographic expressions (Thornbury 1965). The Balcones and Luling zones near San Antonio consist of in echelon normal faults with offsets on the order of 900 and 450 ft, respectively. They were probably active from middle to late Tertiary times (Rose 1972). The Mexia system, and the nearby Karnes trough occur approximately halfway between San Antonio and Houston. Throw of the faults in the Karnes trough is 1,100 to 1,500 ft. It was actively subsiding in early Cretaceous times, and intermittently active since (Rose 1972). The Mexia system is also believed to have been intermittently active. Activity from either of these fault systems has occurred over widely spaced intervals.

Seismic hazards along this portion of the proposed route appear to be minimal, with a 90 percent probability that a maximum 0.04g horizontal acceleration of rock will not be exceeded in 50 years (Algermissen, et al. 1982).

Slope Stability. Some unquantifiable risk of pipeline damage due to slope instability is present along this portion of the proposed route. Such instability would be restricted to cuts and fills at drainage crossings on the Edwards Plateau, and areas of sloping, high shrink-swell clays within the Gulf Coastal Plain.

Karstic Terrain and Subsidence. The Edwards Plateau region is characterized by active solution of limestone, forming openings from small cavities to caverns. Collapse basins and sinkholes are common. Significant subsidence has been documented in the Houston area; this is generally thought to be due to the withdrawal of groundwater and petroleum resources. Such subsidence may occur where the ROW passes existing oil fields.

Paleontology. Fossil marine fauna are common in the Edwards limestones. These are generally comprised of oysters, clams, snails, and ammonites. Some rare ammonites do occur in the Edwards Group. Paleontological resources in the Gulf Coastal Plain include tertiary vertebrate mammal fossils. No areas of unique paleontological resources would be crossed by the pipeline.

Mineral/Petroleum Resources. Commercial lignite deposits are found in the lower Eocene Wilcox Group that occurs in a narrow belt east of San Antonio. The coal deposits apparently thin out in the vicinity of the proposed ROW and thus are not anticipated to be of significant concern. Several oil and gas fields occur within or near the proposed route. Active sand and gravel operations and developable zones of ceramic clay and sulfur exist in the inland coastal plain area (Kier 1974).

3.6.3 Soils

The major soil units intersected by the McCamey to Freeport alternative route are described on Table 3-37. The combined use of the General Soil Map of Texas (Godfrey et al., 1973) and applicable soil series descriptions provided the information necessary to complete this table. Additional information was provided by the State Soil Conservation Service (Newman 1984, personal communication). The majority of the soils along this route are characterized by high shrink-swell potential. Shallow soils are common in the Edwards Plateau area and highly productive rice croplands are concentrated along the coast.

3.6.4 Surface Water

The McCamey to Freeport Alternative would cross 17 perennial and 123 intermittant or ephemeral streams (Table 3-38). Only seven of these streams have stream gages with recent records (Table 3-39). Response to precipitation is flashy; streams on the McCamey end of the pipeline can carry large sediment loads but may dry up during the summer months. Springs are important sources of streamflow on the Freeport end of the proposed alternative west of the Balcones escarpment, and most streams will flow the year around at least in some reaches. USGS Water Supply Papers indicate that no municipalities in the vicinity of the proposed alternative route use surface water as a source of municipal supply (Sundstrom et al. 1948, Sunstrum et al. 1949, Broadhurst 1951).

The streams that have been gaged all had very large maximum discharges compared with average discharges during the period of record (Table 3-39). The Llana River has a mean annual discharge of 193 cfs, but a historical maximum discharge of 319,000 cfs occurred on June 14, 1935 (69 years of record). The Guadalupe River has also produced an impressively large discharge of 240,000 cfs on August 2, 1978. The average discharge for the 45-year period of record is 180 cfs.

3.6.5 Groundwater

The McCamey to Freeport Alternative can be divided into three segments to describe general groundwater conditions. The western segment from McCamey through Sutton County crosses the western part of the Edwards Plateau. Groundwater of fair to good quality (TDS = 280 to 1,370 ppm) is pumped from depths of 116 to 365 ft for domestic, municipal, and agricultural purposes. The primary bedrock aquifers are the Trinity sandstone and Fredericksburg limestone groups of lower Cretaceous age (Broadhurst et al. 1951). Secondary aquifers are Quaternary alluvium of limited extent where groundwater may occur at depths of less than 100 ft along stream valleys. Approximately 15 miles of the pipeline route cross sensitive alluvial valleys; in the remainder of this segment the depth to groundwater is greater than 100 ft.

TABLE 3-37

MAJOR SOIL UNITS, McCAMEY TO FREEPORT ALTERNATIVE

Location	Soil Series, Association, Land Types	Setting	Slope (%)	Depth[1]	Texture	Drainage Class	Limiting Factors
Edwards Plateau							
McCamey to Sonora (Pecos, Crockett Counties)	Ector -	hills, mountains, and mesas	1-40	very shallow	gravelly loam	well	Depth to rock, slope, stoniness
	Conger -		0-5	shallow	loam		
	Rock outcrop		--	--	--		
Sonora to Kerrville (Sutton, Kimble, Kerr Counties)	Tarrant -	undulating uplands	1-50	very shallow and shallow	cobbly clay	well	Depth to rock, high shrink-swell potential, stoniness, slope
	Kavett -		0-5	shallow	silty clay		
	Tobosa		0-3	deep	clay		
Kerrville to New Braunfels (Kerr, Kendall, Comal Counties)	Tarrant -	undulating uplands	1-50	very shallow and shallow	cobbly clay	well	Depth to rock, high shrink-swell potential, stoniness, slope
	Brackett -		1-30		loam		
	Speck	low ridges	0-3		clay loam		
Blackland Prairie							
New Braunfels to Luling (Guadalupe, Caldwell Counties)	Houston Black -	uplands	0-3	deep	clay	well	High shrink-swell potential
	Heiden -		0-20		clay		
	Austin	erosional uplands	0-8	moderately deep	silty clay		
	Wilson -	ancient terraces and uplands	0-5	deep	silt loam	somewhat poorly	High shrink-swell potential, wetness
	Crockett -	uplands	0-10		sandy loam	moderately well	
	Burleson	upland terraces	0-5		clay		
Claypan Area							
Luling to south of Waelder (Caldwell, Gonzales Counties)	Lufkin -	uplands	0-3	deep	sandy loam	somewhat poorly to poorly	High shrink-swell potential, wetness
	Axtell -	uplands and ancient terraces	0-12			moderately well	
	Tabor	broad uplands	0-5				
Blackland Prairies							
South of Waelder to Hallettsville (Gonzales, Lavaca Counties)	Wilson -	ancient terraces and uplands	0-5	deep	silt loam	somewhat poorly	High shrink-swell potential, wetness
	Crockett -	uplands	0-10		sandy loam	moderately well	
	Burleson	upland terraces	0-5		clay		
	Burleson -	upland terraces	0-5	deep	clay	moderately well	High shrink-swell potential, wetness
	Heiden -	uplands	0-20			well	
	Crockett		0-10		sandy loam	moderately well	

TABLE 3-37 (CONTINUED)

Location	Soil Series, Association, Land Types	Setting	Slope (%)	Depth[1]	Texture	Drainage Class	Limiting Factors
Claypan Area							
Hallettsville to east boundary of Lavaca County (Lavaca County)	Lufkin -	uplands	0-3	deep	sandy loam	somewhat poorly to poorly	High shrink-swell potential, wetness
	Axtell -	uplands and ancient terraces	0-12			moderately well	
	Tabor	broad uplands	0-5				
Coast Prairie							
Colorado County	Katy -	coastal prairie	0-5	deep	sandy loam	somewhat poorly	Wetness, irrigated cropland
	Hockley -	lowlands and low	0-5			moderately well	
	Clodine	ridges	0-1		loam	poorly	
East of Wharton to Freeport (Wharton, Fort Bend, Brazoria Counties)	Miller - Norwood - Pledger	high floodplains	0-1	deep	clay, loam	somewhat poorly	High shrink-swell potential, occasional flooding, irrigated cropland
	Moreland - Pledger - Norwood						

Source: Godfrey, C. L., G. S. McKee, and H. Oakes. 1973. General Soil Map of Texas. Published by Texas Agricultural Experiment Station, Texas A&M University in cooperation with Soil Conservation Service, U.S.D.A

[1]very deep = >60 inches
deep = 40-60 inches
moderately deep = 20-40 inches
shallow = 10-20 inches

TABLE 3-38

STREAM CROSSINGS BETWEEN McCAMEY AND FREEPORT, TEXAS

County	Stream Crossed	Status[1]
Pecos	Unnamed	I
	Unnamed	I
	Unnamed	I
	Unnamed	I
	Unnamed	I
	Unnamed	I
	Unnamed	I
	Unnamed	I
	Unnamed	I
	Unnamed	I
	Unnamed	I
Crockett	Pecos River	P
	Unnamed	I
	Live Oak Creek	I
	Unnamed	I
	Unnamed	I
	Unnamed	I
	Unnamed	I
	Unnamed	I
	Howard's Draw	I
	Unnamed	I
	Unnamed	I
	Johnson Draw	I
	Unnamed	I
	Unnamed	I
	Unnamed	I
	Unnamed	I
Sutton	Unnamed	I
	Granger Creek	I
	Unnamed	I
	Unnamed	I
	Unnamed	I
	Unnamed	I
	Devil's River	I
	Unnamed	I
	Unnamed	I
	Unnamed	I
	Unnamed	I
	Unnamed	I
	Ten Mile Draw	I
	Live Oak Draw	I
	Dry Llano River	I
	Unnamed	I
	Unnamed	I

TABLE 3-38 (CONTINUED)

County	Stream Crossed	Status[1]
Kimble	Unnamed	I
	Unnamed	I
	Maynard Creek	I
	Bois d'Arc Creek	I
	Llano River	P
	Unnamed	I
	Chalk Creek	I
	Unnamed	I
	Dry Cedar Creek	I
	Unnamed	I
	Unnamed	I
	Johnson's Fork Creek	P
	East Johnson's Fork Creek	I
Kerr	Unnamed	I
	Unnamed	I
	Unnamed	I
	Unnamed	I
	Unnamed	I
	Unnamed	I
	Husenninkel Creek	I
Kendall	Unnamed	I
	Flat Rock Creek	I
	Guadalupe River	P
	Joshua Creek	P
	Wasp Creek	P
	Sabines Creek	P
	Spring Creek	P
Comal	Honey Creek	I
	Indian Creek	I
	Lewis Creek	I
	Unnamed	I
	Unnamed	I
	Unnamed	I
	Unnamed	I
	Dry Comal Creek	I
	Unnamed	I
Guadalupe	Guadalupe River	P
	Alligator Creek	I
	Unnamed	I
	Unnamed	I
	York Creek	I
	Unnamed	I
	San Marcos River	P
	Unnamed	I
	Unnamed	I

TABLE 3-38 (CONTINUED)

County	Stream Crossed	Status[1]
Guadalupe (Continued)		
	West Fork Plum Creek	I
	Plum Creek	P
	Unnamed	I
	Unnamed	I
	Unnamed	I
Gonzales	Sandy Fork Creek	I
	Unnamed	I
	Unnamed	I
	Unnamed	I
	Unnamed	I
	Unnamed	I
	Unnamed	I
	Baldridge Creek	I
	Peach Creek	I
Lavaca	Lavaca River	P
	Unnamed	I
	Unnamed	I
	Unnamed	I
	Unnamed	I
	Unnamed	I
	Unnamed	I
	Mirror Creek	I
	Navidad River	P
	Honey Creek	I
	Crooked Creek	I
	West Ragsdale Creek	I
	West Sandy Creek	I
	Sandy Creek	I
	Pinoah Creek	I
	Colorado River	P
	Caney Creek	I
Wharton	Colorado River	P
Brazoria	San Bernard River	P
	Brazos River	P

Source: USGS Topographic Maps, 1:250,000 scale.

[1]I = Intermittent; P = Perennial; NA = Not Applicable.

TABLE 3-39

AVAILABLE GAGE RECORDS FOR STREAMS CROSSED BY
McCAMEY TO FREEPORT ALTERNATIVE

River	Watershed Area mi^2	Mean Annual cfs	Period Recorded	Maximum Discharge		Minimum Discharge		Remarks
				cfs	Date	cfs	Date	
Pecos	29,560	87.9	1939-1984	20,000	10/5/84	2.2	7/18/64	Reg by Red Bluff Res. Numerous diversions.
Llana N. Junction	1,874	193	1915-1984	319,000	6/14/35	3.1	8/17/56	Station is 10 mi upstream of proposed crossing.
Guadalupe	839	180	1938-1984	240,000	8/2/78	No flow	5/2/57	Many small diversions above station.
San Marcos	838	369	1939-1984	57,000	9/12/52	43	8/12/51	Station is 5 mi downstream of proposed pipeline; controlled by flood detention ponds.
Plum Creek	309	104	1930-1984	78,500	7/1/36	No flow	at times	Station is 5 mi downstream of proposed pipeline crossing, flow regulated by flood detention ponds.
Lavaca	108	48.4	1939-1984	93,100	6/30/40	No flow	1953-1956	Records good; station is 10 mi downstream of proposed crossing.
Nividad	332	159	1961-1984	53,500	9/13/74	No flow	8/5-7/64; 9/2-16/64	Good records; station is 5 mi downstream of proposed crossing.

Source: USGS 1980d

The segment from Kimble County through Comal County traverses the eastern portion of the Edwards Plateau. Aquifers include the Trinity and Fredericksburg Groups. Because of higher annual precipitation in eastern Texas and the regional groundwater discharge area along the Balcones Fault Zone, groundwater is more abundant and occurs at shallower depths in the eastern Edwards Plateau segment than in the western segment. Groundwater is extensively used for domestic, municipal, and other uses along this pipeline segment. Most notable is the Edwards limestone aquifer (part of the Fredericksburg Group) which has the largest perennial yield of any aquifer in Texas and is the principal water supply for the City of San Antonio (Sundstrom et al. 1949). Because of the high degree of use, shallow depth to groundwater, and ease of contaminant transport in open fractures and solution cavities in limestone aquifers, this entire 135-mile segment of the pipeline is sensitive.

The easternmost and final segment of the alternative pipeline route crosses the Gulf Coastal Plain from New Braunfels to Freeport. Tertiary and Quaternary age sediments dip gently to the southeast and contain shallow water table aquifers near outcrops and confined aquifers beneath interlayered clay strata at depth. Tertiary aquifers include the Carrizo sand, sands of the Wilcox group, Catahoula tuff, Oakville sandstone, sands of the Lagarto Formation, and the Goliad Sand. Quaternary age aquifers include the Lissie Formation, sands of the Beaumont Formation, and recent alluvium (Broadhurst et al. 1950 and Sundstrom et al 1948). Along most of this 180-mile pipeline segment, these aquifers are used to a moderate degree for domestic, municipal and agricultural uses. Because of the shallow (<100 ft) depth to water in the outcrop areas, these aquifers are sensitive to potential contamination. Deeper, confined aquifers are less likely to be contaminated. Approximately 70 percent, or 130 miles, of the segment is underlain by sensitive aquifers.

The total length of sensitive groundwater areas along the McCamey to Freeport alternative pipeline alignment is 280 miles; a summary of affected groundwater basins is presented in Table 3-40.

3.6.6 Aquatic Biology

<u>Aquatic Communities and Habitat Characteristics</u>. Only 14 of the 140 proposed stream crossings between McCamey and Freeport represent perennial or larger intermittent streams (see Table 3-38). Information describing fish occurrence in streams proposed to be crossed by this alternative is limited (Bounds 1984, personal communication). Based on a checklist that describes fish distribution for geographical areas in Texas (Hubbs 1982), a total of 116 species of fish potentially occur in these streams, including 32 game fish species (Appendix B, Table B-10). The most popular and widespread freshwater game fish is the largemouth bass [Texas Parks and Wildlife Department (TPWD) 1971]. Habitat preference and life history information are summarized for selected game fish species in Appendix B, Table B-2.

<u>Threatened and Endangered Species</u>. Two federally listed endangered fish species, the fountain darter (<u>Etheostoma fonticola</u>) and the San

TABLE 3-40

GROUNDWATER BASINS SUMMARY, McCAMEY TO FREEPORT ALTERNATIVE

Groundwater Basin	Length of Pipeline Through Basin (mi)	Minimum Depth to Water Table (ft.)	Degree of Groundwater Development	Total Dissolved Solids (ppm)
McCamey to Freeport Alternative				
Western Edwards Plateau[1]	145 (15*)	116-365	Moderate	280-1,370
Eastern Edwards Plateau[2]	135*	<100	High	280-827
Gulf Coastal Plain[3]	180 (130*)	<100	Moderate High	250-1,100

Sources:

[1]Broadhurst et al. 1951.

[2]Sundstrom et al. 1949 and Broadhurst et al. 1950.

[3]Broadhurst et al. 1950 and Sundstrom et al. 1948.

*Indicates miles of sensitive groundwater basins.

Marcos gambusia (Gambusia georgi), occur in the headwaters of the San Marcus River below the mouth of Blanco River in Comal County. Both species are also listed by the Texas Organization for Endangered Species (TOES) and the TPWD as endangered (TOES 1979). The proposed alternative pipeline would cross the San Marcos River downstream from both these species' critical habitat.

Four additional fish species, the Rio Grande darter (Etheostoma grahama), river darter (Hadropterus shumardi), proserpine shiner (Notropis proserpinus), and blue sucker (Cycleptus elongatus), are listed as threatened by the TPWD (Potter 1984, personal communication). The Rio Grande darter and proserpine shiner occur only in the Pecos River drainage, while the river darter and blue sucker occur in several drainages along the pipeline route. Exact locations of all these species in relation to the pipeline route are not know at this time. Habitat requirements and life history information are summarized for these species in Appendix B Table B-2.

3.6.7 Terrestrial Biology

General Vegetation and Wildlife. In general, the McCamey to Freeport Alternative traverses various shrub savannahs, oak-hickory forests, and several grassland communities from west to east Texas. Based on Kuchler's (1964) classification system, these three broad vegetation types are subdivided into eight general potential natural vegetation types including: 1) the Trans-Pecos shrub, mesquite, and juniper-oak savannahs, 2) oak-hickory forests, and 3) the blackland, Fayette, bluestem-sacahuista and southern cordgrass prairies. Approximately 57 percent of the pipeline would cross the shrub savannah type, 19 percent would cross irrigated agriculture, 13 percent forest/pasture, and 11 percent dryland agriculture.

From McCamey to Crockett County the pipeline would traverse the eastern edge of the Trans-Pecos shrub savannah. Potential dominant shrub species include tarbush and creosote. In Crockett County, the pipeline would cross the mesquite savannah community, which is dominated by curly mesquite grass, tobosa, and mesquite.

A diversity of wildlife habitats occur along the McCamey to Freeport Alternative. Desert shrews, pallid bats, raccoons, striped skunks, coyotes, bobcats, Mexican ground squirrels, black-tailed prairie dogs, hispid pocket mice, plains harvest mice, deer mice, black-tailed (California) jack rabbits, and mule deer are species which could be expected in the drier habitats throughout the pipeline route in Trans-Pecos Texas. Over 540 species of birds occur in Texas. Although many of these species breed in the state, many migrate through Texas to wintering areas in Mexico or Central America and north to breeding areas in the spring. The distribution of birds in Texas is related to rainfall and vegetation diversity. The McCamey to Freeport Alternative would cross a diversity of habitats that are important to birds, ranging from dry, semi-desert shrub savannah in the west to vast marshlands in the southeast. Each geographic area, based on the existing vegetation, supports a different avian community. The savannah habitats in Pecos and Crockett Counties, because of their elevation and different habitats, support a different group of birds than is found in the Edwards Plateau or in southeastern Texas. Lizards and snakes are expected to be very common throughout habitats occurring along this alternative. Lizards would be more common in the drier habitats in the Trans-Pecos. Most snakes would more common in the central and eastern counties where water is more common, but the entire route is expected to have a high diversity and abundance of snakes.

From Sutton to Comal County, the route would cross the juniper-oak savannah community of the Edwards Plateau area. Characteristic dominant plants include little bluestem, Ashe juniper, and live oak.

The pipeline would cross dry and irrigated cropland and pasture in this region. Wildlife occurs mainly in the scattered areas of native grassland and forests. Species such as the opossum, eastern mole, least shrew, raccoon, armadillo, striped skunk, gray fox, coyote, deer mouse, white-footed mouse, mule deer, and white-tailed deer have adapted to this interspersion of agriculture, pasture, and native habitats. The Edwards Plateau, Crockett to Comal County, is an area of low hills, cedar, and scrub oak, and supports a diversity of birds not found in southeastern counties. The golden-cheeked warbler and black-capped vireo nest only in this region.

The blackland prairie vegetation zone would be traversed from southeastern Comal to Caldwell County. Potential dominant species include little bluestem and Texas needlegrass. However, most of the native blackland prairie along this alternative has been converted to dry cropland. An oak-hickory forest community would be traversed by the pipeline from Caldwell to Lavaca County. This major plant association has been interpreted as a post oak savannah community (Gould 1962). Much of this community is extensively used as pasture. From western to mid-Lavaca County, the route would traverse a narrow band of Fayette prairie that is potentially dominated by little bluestem and buffalo grass. Major portions of the native Fayette prairie have been converted to dryland agriculture. Another band of oak-hickory forest/modified pastures would be crossed from eastern Lavaca to southern Colorado County.

The blackland and Fayette prairie region in Comal, Guadalupe, Caldwell, and Gonzales Counties has been reverted primarily to cropland or grazing, and bird diversity is probably relatively low. The area near Comal County is generally the line between eastern and western bird distribution in Texas. Mammal and reptile diversity and abundance is probably similar to that found in the western Edwards Plateau, with species adapted to a mixture of agriculture, pasture, native habitats, and human presence dominating.

A bluestem-sacahuista prairie community would be crossed from Wharton through Brazoria County. Extensive rice fields and inclusions of dry cropland now replace much of this prairie community. Potential dominants include seacoast bluestem and coastal sacahuista. A narrow coastal band of southern cordgrass prairie that is potentially dominated by smooth cordgrass exists along the Gulf Coast.

Many of these habitats are wet and support a diversity of wildlife species not found in the drier western counties. White-tailed deer, nutria, raccoon, and muskrat would be fairly common in these habitats. Many species of birds nest in the shrub and forest habitats of east Texas, but these habitats occur only in small areas along the pipeline route. Many species migrate through the coastal prairie in Brazoria County.

It is this coastal area, and similar wetland or irrigated agricultural habitats inland as far as Halletsville in Lavaca County, that supports millions of nesting, wintering, or migrating ducks, geese, waterbirds, and shorebirds. The pipeline in these counties would cross some of the most important waterfowl habitat in the state. This region supports 3 to 7 million ducks and geese in the winter (Brownlee 1984), primarily snow geese, Canada geese, white-fronted geese, green-winged teal, pintail, gadwall, mottled duck, fulvous whistling duck, blue-winged teal, and black-bellied whistling duck (Lobpries 1984). Sea ducks such as scaup and redheads are common closer to the coast. In 1981, 69 percent of all ducks and 88 percent of all geese in the state were counted in this region during mid-winter surveys.

The pipeline route crosses four counties which provide important winter waterfowl habitat. Brazoria County provides excellent nesting and feeding habitat in the freshwater and saline marshes. Wharton County is important for waterfowl because of the agricultural areas which provide corn and milo. Colorado County and eastern Lavaca County provide important feeding areas in rice fields. Good waterfowl habitat is less common west of Lavaca County throughout the remaining pipeline segments.

Threatened and Endangered Species. A formal list of potential threatened and endangered species has been requested from the FWS and National Marine Fisheries Service for the McCamey to Freeport Alternative. Through discussions with FWS and Texas Parks and Wildlife personnel, a preliminary list of species has been prepared (Table B-7). Federally protected species include three plants, one mammal, one amphibian, one reptile, and five birds; not counting potential species in marine habitats.

Lloyd's hedgehog cactus is federally endangered and occurs in northeast Pecos County. Tobusch fishhook cactus is federally endangered and occurs in Kerr County in the oak-juniper vegetation type. Texas wildrice, also federally endangered, occurs in Hays County along the San Marcos River. The pipeline, however, crosses the San Marcos River in Guadalupe and Caldwell Counties, and this species could potentially occur in this area also.

The Houston toad presently is known only from two counties (Bastrop and Burleson) that are not crossed by the proposed alternative route. However, this species has historically been reported from Colorado County and could possibly occur in suitable habitat in Guadalupe, Caldwell, Gonzales, Lavaca, Wharton, and Brazoria Counties (Potter 1984, personal communication). Re-introduction of this species is planned, but locations are unknown at this time. American alligators occur in

Lavaca, Wharton, Colorado, and Brazoria Counties in suitable habitat, and were once threatened or endangered in these counties. Recent federal regulations allow the harvest of alligators in designated areas within this region.

The brown pelican is a Federally listed endangered species and is expected to be a migrant in Brazoria County. Brown pelicans would be expected in the project area primarily near Freeport along the Intracoastal Waterway. They do, however, nest in adjacent Matagorda County. Bald eagles (Federally listed endangered species) could occur in any of the 15 counties occurring along the pipeline route as migrants, but are known to nest only in Colorado, Wharton, and Brazoria Counties. Eagles could be common in this area in the winter at certain reservoirs. Arctic peregrine falcons (also endangered) are expected in the region only as migrants. Although potentially occurring as a rare migrant in all 15 counties, they would be most common along the coast in Brazoria County. Attwater's greater prairie chicken is presently known only from eight counties in Texas (Halverson 1984, personal communication). The pipeline would cross one of these counties, Colorado County. The pipeline would not come near the Attwater's Prairie Chicken NWR in Colorado County, but may cross historical habitat. Whooping cranes migrate to Aransas NWR in Aransas County, Texas, from Wood Buffalo National Park, Northwest Territories, Canada. They arrive in Aransas approximately October-November and leave for the northward migration in March-April. The wintering birds are not expected to occur in the vicinity of the pipeline, but cranes migrating to and from Aransas will cross the pipeline route. It is not known at this time if the pipeline would cross areas where cranes feed or rest.

Brazoria County is adjacent to the Gulf of Mexico. The facility at Freeport is not connected directly to the Gulf, but is buffered by the Intracoastal Waterway. Threatened or endangered marine mammals and sea turtles are not expected within this waterway, but could occur on the Gulf side of Brazoria County (Table B-8). The Brazos, San Bernard, and Colorado Rivers would be crossed by the pipeline in southeast Texas. Crossings are all within 40 miles of the coast. Marine mammals and sea turtles would be very rare in or near the estuaries of these rivers.

The Texas Parks and Wildlife Department lists mammals, birds, reptiles, and amphibians that are considered to be threatened or endangered in the state. Many of these species are known to occur in counties crossed by the McCamey to Freeport Alternative including 11 birds, 11 reptiles, and five amphibians (Table B-9).

Special status birds occurring in the area can generally be classified into two groups; those occurring in the western, drier section of the route between Pecos and Comal counties; and those occurring in the wetter areas between Comal and Brazoria counties (mainly Brazoria, Wharton, and Colorado counties). Species such as the aplomado falcon and zone-tailed hawk would be more common in the western counties. The reddish egret, white-tailed hawk, white-faced ibis, swallow-tailed kite, wood stork, and least tern would be more common in the eastern counties where water is more abundant. The interior least tern and golden-checked warbler have limited nesting requirements, with nesting occurring only in certain habitats. Most of these species could nest in habitats that occur on or near the proposed pipeline route.

This general region supports a diversity of special status salamanders not found elsewhere in the state. The exact location of the pipeline relative to these species is not known at this time. The Rio Grande frog, also a special status species, may occur in counties crossed by the pipeline, although it is out of its normal range and was possibly introduced by shipment of house plants.

3.6.8 Socioeconomics

Tables 3-41 and 3-42 provide a baseline overview on demographic, economic, housing, and public services characteristic of the 15 Texas counties traversed by the pipeline in this alternative. Estimated 1983 population in this study area totaled 488,285. Average annual increase in population ranged from 0.46 percent for Pecos County to 4.22 percent in Kendall County.

The most important sectors of economic activity in the area include mining (oil and gas), manufacturing, services, and trade. Major urban centers which influence economic activity in the region of the pipeline route include San Antonio, Austin, Houston, and Galveston. Historically, farming and ranching have been important sectors in the economy and still represent a significant economic activity. The coastal areas have important commercial fishing (fin fish, shrimp, oysters, and blue crabs) and recreation-oriented industry.

Unemployment rates vary from county to county. From 1980 to 1982 all counties except Kimble experienced increases in unemployment. In 1982, unemployment rates ranged from a low of 2.9 percent in Kimble County to a high of 7.8 percent in Crockett County; these were between 0.5 percent and 3.9 percent higher than in 1980. Pecos, Crockett, Brazoria, and Caldwell Counties showed the highest unemployment rates. By November 1983 these rates had dropped by at least one percentage point in most counties, which reflected the upturn in the overall national economic condition. The most important sector in three of these four counties is mining (oil and gas).

Personal income in the 15-county area is based largely on the sectors that provide the greatest share of employment. In 1981, total personal income for the region was $4.5 billion (BEA 1983). The 1981 per capita incomes in the region ranged from $7,765 in Caldwell County up to $12,105 in Kendall County. The national per capita personal income was $10,495 in 1981.

Housing units in the region totaled 82,893 in 1980. Vacancy rates ranged from a low of 10 percent in Brazoria County to a high of 25 percent in Sutton County. Areawide housing vacancies appear high. Temporary overnight accomodations are not abundant along the approximate 230-mile stretch between McCamey and Kerrville. From Kerrville to Freeport small and larger urban areas are frequent and afford many temporary housing opportunities. The estimated number of overnight

TABLE 3-41

REGIONAL ECONOMIC PROFILE: POPULATION, EMPLOYMENT, AND FISCAL CONDITIONS STATISTICS

McCAMEY TO FREEPORT, TEXAS

County	Estimated Population[1]		Average Annual Increase (percent)	Employment[2]		Unemployment Rate[2] (%)		Primary Industries[2]
	1980	1983		1980	1982	1980	1982	
Pecos	14,618	14,825	.46	5,680	6,618	3.6	7.1	Mining, Trade, Local Govt
Crockett	4,608	4,935	2.31	2,117	2,468	3.9	7.8	Mining, Local Govt, Trade
Sutton	5,130	5,674	3.42	2,656	3,154	3.0	4.9	Mining, Trade
Kimble	4,063	4,213	1.22	1,969	2,070	3.1	2.9	Services, Trade
Kerr	28,780	31,237	2.77	10,599	11,586	2.4	3.5	Services, Trade, State & Local Govt
Gillespie	13,532	14,527	2.40	5,667	5,879	4.0	4.4	Trade, Services, Local Govt
Kendall	10,635	12,040	4.22	4,356	4,995	2.7	3.6	Services, Trade
Comal	36,446	40,530	3.60	14,092	14,867	4.6	5.3	Manufacturing, Services, Trade, Local Govt
Guadalupe	46,708	50,659	2.74	18,058	19,052	4.8	5.5	Manufacturing, Trade, Local Govt, Services
Caldwell	23,637	24,838	1.67	7,790	8,772	6.3	6.8	Mining, Services, Trade, Local Govt
Gonzales	16,883	17,193	.60	7,722	8,405	4.1	5.6	Manufacturing, Trade, Local Govt, Services
Lavaca	19,004	19,733	1.26	8,522	8,633	3.3	4.9	Manufacturing, Trade
Colorado	18,823	19,500	1.18	9,286	9,452	3.0	3.7	Mining, Services, Trade, Manufacturing
Wharton	40,242	41,972	1.41	16,265	18,065	4.4	6.6	Mining, Trade, Services, Local Govt
Brazoria	169,587	186,409	3.20	87,280	95,867	4.5	6.8	Manufacturing, Services, Trade, Local Govt

TABLE 3-41 (CONTINUED)

State	County	Personal Income 1981 (Thousands $)[3]	Per Capita Income 1981 ($)[3]	Retail Sales (Thousands $)[4] 1981	Retail Sales (Thousands $)[4] 1982	Percentage Increase (%)	Assessed Valuation 1982[5] (Thousands $)	Property Tax Levy 1982[5] (Thousands $)
Texas	Pecos	148,678	9,575	60,700	70,700	16.5	13,021,000	10,524
	Crockett	51,540	10,542	NA	NA	NA	1,309,000	7,249
	Sutton	59,567	10,988	32,800	35,400	7.9	1,127,000	4,455
	Kimble	33,804	8,148	8,300	8,700	4.8	261,000	1,077
	Kerr	322,900	11,095	88,200	100,700	14.2	1,373,000	5,682
	Gillespie	144,230	10,466	36,800	40,800	10.9	454,000	1,135
	Kendall	134,719	12,105	16,100	18,400	14.3	808,000	3,247
	Comal	396,108	10,376	110,100	128,000	16.3	1,295,000	5,093
	Guadalupe	390,959	8,143	108,600	118,900	9.5	1,855,000	14,197
	Caldwell	188,961	7,765	68,200	62,300	(8.7)	793,000	4,741
	Gonzales	163,394	9,320	53,800	50,700	(5.8)	477,000	1,520
	Lavaca	165,052	9,115	53,900	56,000	3.9	846,000	3,346
	Colorado	195,126	10,119	52,500	57,200	9.0	632,000	1,971
	Wharton	384,463	9,365	110,900	119,400	7.7	2,103,000	14,769
	Brazoria	1,799,296	10,127	554,220	599,700	8.2	11,325,000	43,496

Sources:

[1] Texas Department of Water Resources

[2] Texas Employment Commission

[3] Bureau of Economic Analysis, U.S. Department of Commerce

[4] City Sales and Use Tax Allocation Summary, Comptroller. State of Texas.

[5] Annual Report for Tax Year 1982, Texas State Property Tax Board. Best estimate of County and School District assessed valuation.

TABLE 3-42

HOUSING AND PUBLIC SERVICES

McCAMEY TO FREEPORT

County	Units[1] 1980	Vacancy[1] 1980	Hotel/ Motel[2]	Hospitals[3] 1983	Total Beds[3]	County Law Enforcement[4]
Pecos	2,392	17%	711	2	51	38*
Crockett	545	21%	216	1	20	31*
Sutton	594	25%	155	1	26	10
Kimble	1,217	18%	146	1	18	7
Kerr	6,715	16%	663	5	1,230	51*
Gillespie	3,410	15%	318	1	61	23*
Kendall	3,502	19%	125	NA	NA	26*
Comal	7,018	17%	1,036	1	86	43
Guadalupe	9,029	12%	289	1	75	40
Caldwell	3,388	14%	154	1	44	32*
Gonzales	4,563	23%	136	1	42	27
Lavaca	5,967	22%	191	3	110	16*
Colorado	5,491	19%	94	3	111	21*
Wharton	7,787	10%	216	2	210	51*
Brazoria	21,275	10%	530	2	169	51

Sources:

[1]U.S. Bureau of Census

[2]4th Quarter 1983 Hotel Tax Accounts, Comptroller; State of Texas.

[3]American Hospital Association 1983

[4]FBI 1982, Uniform Crime Report

*City & County Figures

rooms available in communities close to the pipeline are shown on Table 3-42. Another 9,495 rooms are available in the cities of Austin, San Angelo, Rosenberg, and Yorktown, which are within commuting distance of the proposed pipeline. Campsites in proximity to the pipeline route are numerous from Kerrville to Freeport.

Public facilities and services are adequately provided in all population centers.

3.6.9 Land Use and Recreation

Land Ownership and Land Use. Land ownership for the alternative from McCamey to Freeport is dominated by private entities with less than 1 percent under local, state, or federal government ownership.

From McCamey the route passes through predominantly open space grazing lands with scattered oil fields to Comal County near San Antonio. Several small towns lie adjacent to the pipeline but none would be directly crossed. In Comal, Caldwell, and Guadalupe Counties the ROW would cross the blackland prairie, an area of dryland farming (Newman 1984, personal communication). Common crops include cotton and grains. Beyond Guadalupe County post oak forest land is encountered through Lavaca County. From this area to the coast the route passes through the Coastal Plain, a region of mixed irrigated and dryland farming. This area is one of the largest rice producing regions in the country. Dryland crops, such as grains are also grown. Scattered farm houses and small unincorporated communities are the only residential areas adjacent to the pipeline route. The ROW would cross the Colorado and Brazos Rivers, which are major streams used for agricultural and urban uses.

The route ends at the existing Freeport Seaway Terminal, about 50 miles south of Houston. Within the Freeport area the route passes through open space and agricultural lands along with industrial areas associated with petroleum production. No residential areas are nearby. About 7 miles northeast of the terminal is Brazoria NWR. The San Bernard NWR lies about 10 miles southwest. Neither refuge would be crossed by the pipeline. The proposed ROW would be within or adjacent to existing pipeline ROWs.

Land Use Regulations and Plans. Section 3.2.9.3 describes the applicable land use regulations and policies for pipelines in Texas. The state has no authority to regulate pipeline location, but it does have limited regulations regarding pipeline operation. Individual counties require permits for crossing roads and for the construction and operation of pump stations. Most counties do not have land use/ comprehensive plans.

Recreational Facilities and Use. Lands crossed by this alternative ROW are predominately in private ownership with limited public recreation opportunities. Many farms and ranches lease their lands to private clubs or groups for deer and/or waterfowl hunting in the fall and winter months. The route crosses no designated recreation areas or facilities. No state or national parks are encountered. The Brazoria and San Bernard NWRs are located near the proposed route at Freeport. The Gulf of Mexico and its adjacent estuarine resources provide opportunities for fishing, boating, and beach activities.

3.6.10 Transportation

Major highways that would be crossed by the McCamey to Freeport Alternative are listed in Table 3-43. As would be expected, the frequency of highway crossings increases with increased population density in the eastern half of the alternative.

3.6.11 Cultural Resources

Due to the general nature of the ROW location between McCamey and Freeport, only general site distributions and predictions of sensitive areas can be presented. Extensive research in the area crossed by the McCamey to Freeport Alternative has demonstrated the existence of abundant and diverse cultural resources. These resources range in age from the earliest through the most recent periods of human occupation. The properties which have been recorded include burnt rock middens, extensive shell middens on the coast, rockshelters, quarries, and camps, was well as historic structures (Brown and Killen 1982; Hester 1976; Lynott 1981; Sayles 1935; Skinner 1981; Suhm et al. 1954).

Major sites in this region are usually associated with permanent water sources, particularly rivers. The alternative route crosses most of the major rivers flowing through this part of Texas, thus it is extremely likely that sites will be found along it. However, the abundance of sites known from these areas probably reflects not only the importance of water in determining site locations, but also the overwhelming tendency for archaeological surveys in Texas to be conducted in river basins in the context of flood control and reservoir projects (Shafer 1968, 1969; Sorrow 1969).

3.6.12 Visual Resources

An inventory of visual resources along the McCamey to Freeport Alternative was not conducted due to the preliminary nature of both the ROW and pump station locations. In general the route would cross grazing land in western Texas and agricultural land in eastern Texas; no federal land with established visual management objectives would be crossed. Since the alternative would parallel existing pipeline ROWs for the majority of its length, existing disturbance would be evident and the EVCs would be primarily Types III and IV.

3.6.13 Noise

As noted in Section 3.2.13.3 there are no noise statutes or ordinances in effect at the state or county level in Texas along the McCamey to Freeport alternative route. Land crossed by the route for this alternative is largely grazing land in west Texas; east of I-35 there is cultivated cropland interspersed with the grazing land. Cropland predominates on the coastal plain near Freeport. There are some developed recreation facilities near New Braunfels and the

TABLE 3-43

MAJOR ROADS TO BE INTERSECTED BY THE McCAMEY TO FREEPORT ALTERNATIVE

Highway	County
US 305	Upton
US 290[1] (I-10)	Pecos and Crockett
State 163	Crockett
US 277	Sutton
US 377	Kimble
US 83	Kimble
State 27	Kimble/Kerr
State 783	Gillespie
State 16	Kerr
US 87	Kendall/Kerr
State 473	Kendall/Kerr
State 46	Comal
US 281	Comal
US 81 (I-35)	Comal
State 46	Guadalupe
Sate 123	Guadalupe
State 80	Caldwell
US 183	Caldwell
US 90 (I-10)	Gonzales
State 304	Gonzales
State 95	Lavaca
US 77	Lavaca
US Alt 90	Lavaca
State 71	Colorado
US 59	Wharton
State 60	Wharton
State 35	Brazoria
State 36	Brazoria
State 288	Brazoria

Source: ERT

[1]US 290 would be crossed three times by the pipeline route.

Guadalupe River, but proximity to the route cannot be determined until a centerline is established. The corridor would pass near numerous towns, especially in the San Antonio/Austin region and eastward. Residences in the communities would be considered noise-sensitive, as would some recreation areas, such as camping, picnicking, and hiking areas, if they are close to the ROW.

From the information available, the pump/heater stations appear to be located in rural areas, which should permit them to be sited away from noise-sensitive receptors.

Terrain for this alternative is highly varied. The corridor segment from McCamey to Junction is rolling hills. From Junction to I-35 the terrain is more rugged, almost mountainous, and east of I-35 it transitions from hills to the flat plain near the coast.

Ambient noise levels for most of the McCamey to Freeport Alternative would be in the rural range defined in Section 3.2.13. Exceptions would occur in areas near towns, where suburban to urban noise levels would be expected, and near major highways where high ambient noise levels would be expected for limited areas.

4.0 ENVIRONMENTAL CONSEQUENCES

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 Introduction

Chapter 4 presents a discussion of the environmental consequences that would result from implementation of the Celeron/All American and Getty proposals or the alternatives. In keeping with the directive of the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA), the chapter focuses on impacts that are considered significant; criteria used to establish significance are stated at the beginning of each analysis. Where these criteria were exceeded, impacts were deemed "significant". In many cases, anticipated impacts were compared to the significance criteria and found to be "not significant". The general approach followed throughout the chapter is to briefly describe the range of impacts that would occur and then provide a detailed discussion of those impacts that are considered significant. Exceptions were made, however, when a question of potentially significant impact was identified as an issue in the scoping process, by an agency, or in the impact analysis process, and more detailed discussions were included in the EIR/EIS.

On the Las Flores to Emidio segment, the impacts associated with the Celeron and Getty proposals have been analyzed separately. Impacts that would result from the construction and operation of both projects have also been presented where appropriate. For certain disciplines, the impacts associated with either or both projects would be the same, while for other disciplines, the combined impacts of both projects would be greater than either project analyzed separately. Getty and Celeron/All American representatives were interviewed concerning construction procedures and scheduling, and it was determined to be highly unlikely for Getty and Celeron construction crews to work "side by side". Therefore, it was assumed that construction activities for the two projects would be separated in time and/or space.

Based on this assumption, it was determined that disciplines such as air quality, surface water, aquatic biology, socioeconomics, transportation, and noise would not experience combined impacts. Other disciplines such as soils, terrestrial biology, land use and recreation, cultural resources, visual resources, and oil spill potential would have additive impacts from the construction of both projects. Impacts to geology and groundwater would be essentially the same for either or both projects. Combined impacts from the Celeron and Getty proposals are discussed at the end of the Las Flores to Emidio section for each affected discipline.

4.2 Celeron/All American and Getty Proposals

4.2.1 Air Quality

The Celeron/All American and Getty proposals would consist of pipeline construction and pump station and delivery station operations that would emit various air pollutants including sulfur dioxide (SO_2), oxides of nitrogen (NO_x), total suspended particulates (TSP), carbon monoxide (CO), and hydrocarbons (HC). Maximum concentrations for these pollutants were estimated to determine air quality impacts resulting from the Celeron/All American and Getty proposals. During the construction phase, air quality impacts were based upon pipeline construction on one spread from Las Flores to Emidio for either Getty or Celeron and 5 spreads working simultaneously from Emidio to McCamey.

The analytical techniques used to generate the results (see Appendix A) varied slightly depending upon averaging time, location, and operation being modeled. These variations necessitated the use of several models. Due to the lack of available data near the proposed pipeline route, assumed worst-case scenarios were developed for the short-term (24 hours or less) averaging times.

The project emissions were compared with applicable Federal, state, and county emissions thresholds (e.g., New Source Review), and project emission control devices were evaluated in terms of applicable BACT and LAER requirements. Air quality modeling using EPA approved models was performed for sources emitting pollutants in excess of the significance thresholds. The modeling results were then compared with allowable pollutant concentrations as specified in county, state, and Federal ambient standards and increments, including those for Class I areas.

Air quality impacts were judged significant or not significant based on regulatory standards, and best professional judgement of resource specialists. The National Ambient Air Quality Standards (NAAQS), and the ambient air quality standards for California, Arizona, New Mexico, and Texas are all important benchmarks for significant impacts. Primary and secondary NAAQS and state standards have been issued for SO_2, NO_2, TSP, CO, ozone (O_3), and HC. These standards are summarized in Appendix A. Primary standards are designed to protect public health, while secondary standards are designed to protect public welfare. Annual average standards are never to be exceeded. Short-term standards (24 hours or less) cannot be exceeded more than once per year, except in California where no standards can be exceeded.

New large pollutant sources in attainment areas (areas where the NAAQS are met) are also subject to prevention of significant deterioration (PSD) review. PSD regulations further control pollutant emissions by allowing the maximum predicted concentrations from a new major source and any other nearby previously permitted PSD sources to be a fraction of the NAAGS. PSD regulations in California, Arizona, New Mexico, and Texas establish air quality increments for SO_2 and TSP that restrict deterioration by major sources. The applicable SO_2 and TSP PSD increments are shown in Appendix A, Table A-3. The PSD increments are much smaller than corresponding NAAQS and state standards; therefore, the increments are often more limiting in determining the size of new projects that may be built. Since no new emission sources would be located in Santa Barbara County, Santa Barbara Air Pollution Control District PSD regulations, which are stricter, would not apply.

The amount of deterioration by new sources is determined by the classification of the area. Presently, the entire area surrounding the proposed projects is designated as PSD Class II, which allows for moderate air quality deterioration. Little air quality deterioration is allowed in PSD Class I areas. The closest existing Class I areas are the Guadelupe Mountains National Park (Texas) located within 650 yards of the pipeline, and the San Rafael Wilderness (California) located approximately 8.5 miles east of the proposed Sisquoc pump station. The PSD increments in Appendix A (Table A-3) apply not only to routinely operating sources such as the pump stations and tank farms, but also to temporary sources located near Class I areas [40 CFR 52.21(i)(6)]. Examples of temporary sources in the Celeron/All American and Getty proposals would include the construction of the pump stations and pipelines. No significant air quality impacts in Class I areas have been predicted by modeling results.

The following sections summarize the predicted maximum air quality impacts from the proposed construction and operational activities and compare the impacts to applicable significance criteria. The results are described for each of the pipeline segments and include the maximum concentrations for each pollutant for the construction phase of the pipeline as well as the operational phase of the pump stations.

4.2.1.1 Las Flores to Emidio

Construction. The construction emissions inventory for this segment is summarized in Appendix A, Table A-11. A detailed discussion of the emissions inventory associated with total pipeline construction is also contained in Appendix A. The primary sources of emissions during construction for all segments of the pipeline would be heavy-duty vehicular traffic. CO emissions would be emitted in the largest quantities during construction followed by NO_x, HC, TSP, and SO_2 emissions.

Maximum modeled impacts occurred within 200 yards of the construction activities on all pipeline segments analyzed. The methodology used in the modeling for the construction phase can be found in Appendix A. The summary of maximum worst-case short-term impacts resulting from the construction of the Celeron/All American and Getty pipelines is found in Table 4-1. The pollutants for which violations are predicted are CO and TSP for both celeron and Getty. All other ambient pollutant concentrations would be within appropriate California and Federal standards. It should be noted that the background concentration for the CO (8-hour) violates both state and Federal standards and the construction contribution is only 1 percent of the total concentration. Also the closest ambient CO monitoring station was located near Bakersfield, where the major contributor is automobile exhaust from major traffic routes. Thus, the background value at the pipeline construction site is expected to be much less. No significant impact would occur.

The appropriate TSP (24-hour) background concentrations violate the California standard and the Federal secondary standard. The contribution from the construction emissions would account for only 2 percent of the California ambient value and 4 percent of the Federal concentration. Moreover, the meteorological conditions which produce the maximum background concentration (relatively high wind speeds) were

TABLE 4-1

SUMMARY OF AIR QUALITY IMPACTS FROM THE CONSTRUCTION OF THE CELERON/ ALL AMERICAN AND GETTY PROPOSED PIPELINES FROM LAS FLORES TO EMIDIO

Pollutant	Maximum Project Concentration (μg/m³)	Maximum[1] Background Concentration (μg/m³)	Total Ambient Concentration (μg/m³)	California/ Federal Standard (μg/m³)
Celeron/All American				
SO_2				
1-hour	4.8	653	657.8	1,310/--
3-hour	4.8	653	657.8	--/1,300
24-hour	1.2	125	126.2	131/365
NO_2				
1-hour	59.3	320	379.3	470/--
TSP				
24-hour	9.8	411/244	421/254	100/260
CO				
1-hour	236	19,295	19,531	23,000/40,000
8-hour	177	13,961	14,138	10,000/10,000
Getty				
SO_2				
1-hour	6.3	653	659.3	1,310/--
3-hour	6.3	653	659.3	--/1,300
24-hour	1.6	125	126.6	131/365
NO_2				
1-hour	52.2	320	372.2	470/--
TSP				
24-hour	7.6	411/244	419/252	100/260
CO				
1-hour	100.8	19,295	19,396	23,000/40,000
8-hour	83.1	13,961	14,044	10,000/10,000

Source: ERT

[1]For comparison with CAAQS, highest concentration in 1980-1982 period is used. For comparison with NAAQS, highest of the second highest concentrations in 1980-1982 is used.

not the conditions which produced the maximum computed concentration (low wind speed and stable conditions). Therefore, maximum construction and maximum background concentration are not expected to occur simultaneously. Also since the construction emissions would be temporary and transient, EPA (Diggs 1984, and Harper 1984, personal communications) and county, permitting agencies (Goff 1984, and Stroman 1984, personal communications) believe that no significant long-term or permanent impacts would occur.

The maximum 24-hour TSP concentration is estimated to be 1 $\mu g/m^3$ at the San Rafael Wilderness which is the nearest Class I area (located approximately 8.5 miles from the pipeline). The maximum 3-hour SO_2 concentration is less than 1 $\mu g/m^3$ at the nearest point of the wilderness. Thus no significant impacts are expected in the Class I area.

Operation. The operation of the pipeline segments from Las Flores to Emidio would consist of three pump stations, one of which could contain oil heaters (Getty's Cuyama pump station). Since electric-powered pumping would be used, the only emissions would be from the natural gas-fired oil heaters at Cuyama. Details for the emissions inventory can be found in Appendix A. Since natural gas would be used for oil heating, the majority of emissions would be NO_x; CO and HC would also be emitted with only a trace of TSP and SO_2 emissions. Due to the source configurations, maximum modeled impacts occurred approximately 100 yards from the source. The summary of maximum projected impacts can be found on Table 4-2. Ambient concentrations of TSP and CO are predicted to violate the 24-hour California TSP standard and the 8-hour state and Federal CO standards. However, this project contribution is less than one-tenth of 1 percent of this total concentration. This, combined with the discussion of the respective background values above, no significant impacts are expected to occur from the operation of the pump/heater station at Cuyama (Ronyecz 1984, personal communication).

4.2.1.2 Emidio to Blythe

Construction. The construction emissions inventory for this segment of the pipeline is summarized in Appendix A. The summary of maximum worst-case short-term impacts resulting from the construction of the proposed pipeline in eastern California are found in Table 4-3. The only pollutants for which violations are predicted are NO_2 and TSP. All other ambient pollutant concentrations were within appropriate California and Federal standards. It should be noted that the background concentrations for both NO_2 (1 hour) and TSP (24-hour) violate applicable standards. The construction contribution would account for less than 10 percent of the total NO_2 concentration and 3 percent of the total TSP concentration. However, since the construction emissions are temporary and transient, the Southeast Desert Air Pollution Control District would not consider the NO_x and TSP concentrations as significant impacts (Hubbard 1984, personal communication). The short-term increase in TSP along the ROW is also not expected to significantly decrease visibility in the area around Edwards Air Force Base.

TABLE 4-2

SUMMARY OF AIR QUALITY IMPACTS FROM THE OPERATION OF THE PROPOSED PIPELINES FROM LAS FLORES TO McCAMEY

Pollutant	Maximum Project Concentration (μg/m³)	Maximum[1] Background Concentration (μg/m³)	Total Ambient Concentration (μg/m³)	State[2]/ Federal Standard (μg/m³)
Las Flores to Emidio (Getty)[3]				
SO_2				
1-hour	0.08	653	653	1,310/--
3-hour	0.18	653	653	--/1,300
24-hour	0.03	125	125	131/365
NO_2				
1-hour	32.6	320	352.6	470/--
TSP				
24-hour	0.1	187/170	187/170	100/260
CO				
1-hour	21.9	19,295	19,317	23,000/40,000
8-hour	10.9	13,961	13,972	10,000/10,000
Emidio to Blythe (Celeron/All American)				
SO_2				
1-hour	0.13	78	78.3	1,310/--
3-hour	0.3	78	78.3	--/1,300
24-hour	0.05	26	26.0	131/365
NO_2				
1-hour	54.7	564	619	470/--
TSP				
24-hour	0.1	300/179	300/179	100/260
CO				
1-hour	21.9	6,810	6,832	23,000/40,000
8-hour	10.9	5,562	5,573	10,000/10,000
Blythe to McCamey (Celeron/All American)				
SO_2				
3-hour	0.97	1,175	1,176	--/1,300
24-hour	0.41	339	339	--/365

TABLE 4-2 (CONTINUED)

Pollutant	Maximum Project Concentration ($\mu g/m^3$)	Maximum[1] Background Concentration ($\mu g/m^3$)	Total Ambient Concentration ($\mu g/m^3$)	State[2]/ Federal Standard ($\mu g/m^3$)
NO_2				
Annual	7.1	16	23.1	100/100
TSP				
24-hour	0.1	451	451	150/260
CO				
1-hour	108.0	17,025	17,133	14,500/40,000
8-hour	97.1	10,000	10,097	9,700/10,000

Source: ERT

[1]For comparison with CAAQS, highest concentration in 1980-1982 period is used. For comparison with NAAQS, highest of the second highest concentrations in 1980-1982 is used.

[2]California standards for Las Flores to Blythe and New Mexico standards for Blythe to McCamey.

[3]No heaters would be required by Celeron/All American along this segment.

TABLE 4-3

SUMMARY OF AIR QUALITY IMPACTS FROM CONSTRUCTION OF THE PROPOSED PIPELINE FROM EMIDIO TO BLYTHE AND THE BLYTHE TO McCAMEY

Pollutant	Maximum Project Concentration (μg/m³)	Maximum[1] Background Concentration (μg/m³)	Total Ambient Concentration (μg/m³)	State[2]/ Federal Standard (μg/m³)
Emidio to Blythe				
SO_2				
1-hour	4.8	78	82.8	1,310/--
3-hour	4.8	78	82.8	--/1,300
24-hour	1.2	26	27.2	131/365
NO_2				
1-hour	59.3	564	623	470/--
TSP				
24-hour	9.8	426/419	435.8/428.8	100/260
CO				
1-hour	236	6,810	7,046	23,000/40,000
8-hour	177.0	5,562	5,739	10,000/10,000
Blythe to McCamey				
SO_2				
3-hour	6.3	3,518	3,523	--/1,300
24-hour	1.6	514	515.2	260/365
NO_2				
24-hour	52.2	60	119.3	200/--
TSP				
24-hour	7.6	364	371.6	150/260
CO				
1-hour	100.8	17,025	17,126	14,500/40,000
8-hour	83.1	10,000	10,083	9,700/10,000

Source: ERT

[1]For comparison with CAAQS, highest concentration in 1980-1982 period is used. For comparison with NAAQS, highest of the second highest concentrations in 1980-1982 is used.

[2]California standards for Emidio to Blythe and New Mexico standards for Blythe to McCamey.

Operation. The operation of the 294-mile pipeline segment from Emidio to Blythe would consist of four pumping/heating stations as well as an oil storage facility at Cadiz. Since electric-powered pumping would be used between Emidio and Blythe, only emissions from natural gas-fired oil heaters would be generated, with the exception of the tank farm at Cadiz. Hydrocarbon emissions would be emitted by the loading and unloading of oil at this storage facility. Details for the emissions inventory can be found in Appendix A. Since natural gas would be used for oil heating, the majority of emissions would be NO_x; CO and HC would also be emitted with only a trace of TSP and SO_2 emissions.

Due to the source configurations, maximum modeled impacts occurred approximately 100 yards from the source. The summary of maximum projected impacts can be found on Table 4-2. The only pollutant for which a violation is predicted is NO_2. This violation would occur at the Twelve-Gauge Lake pump station. The operation contribution of NO_2 would account for less than 9 percent of the total ambient concentration. It should be noted that the background concentration for NO_2 (1-hour) exceeds the applicable California standards. Only one background violation has occurred in 1980 through 1982 indicating a very infrequent combination of events. Thus, the occurrence of NO_2 background violations during the operation phase in the Barstow area would be very infrequent. Due to the size of the pump station and its location relative to the monitoring site (approximately 12 miles), no significant impact is expected (Hubbard 1984 personal communication). No modeling for annual concentrations was performed since the maximum 24-hour NO_2 concentration of 15.3 $\mu g/m^3$ was well below the Federal annual standard of 100 $\mu g/m^3$.

No appreciable air quality impacts from SO_2, CO, or TSP would be generated from the operation of pump stations from Emidio to Blythe. Maximum project concentrations for SO_2 and TSP for all averaging times were well below 1 $\mu g/m^3$. The maximum predicted 1 and 8-hour CO concentrations for CO were 21.9 $\mu g/m^3$ and 10.9 $\mu g/m^3$, respectively. These are less than 1/10 of 1 percent of their respective California standards.

The San Bernardino County New Source Rule would not be in effect because the emissions of hydrocarbons at the Cadiz tank farm would be less than 250 lbs/day (see Appendix A, Table A-11). Therefore, it was not deemed necessary to perform modeling to address the effect of these emissions on ozone concentration and significant impacts are not anticipated.

4.2.1.3 Blythe to McCamey

Construction. The construction emissions inventory for each spread is summarized in Appendix A. The summary of maximum short-term impacts resulting from the construction of the proposed pipeline is found in Table 4-3. High background concentrations, in violation of New Mexico and Federal standards, produced predicted violations for SO_2, CO, and TSP.

As in the prior pipeline construction analyses, the contribution of the construction emissions from the Celeron/All American pipeline accounted for less than 1 percent of the total SO_2 concentration, 2 percent of the total CO concentration, and 3 percent of the total TSP concentration. The nearest ambient CO monitoring station was located in Las Cruces, nearly 20 miles away. Since the major contributors of CO emissions are automobiles, the maximum background values at the pipeline are expected to be much less. Since the construction emissions for SO_2, CO, and TSP would occur for only a short time in any one area, it again would be unlikely to have the maximum ambient concentrations and maximum construction concentrations occur simultaneously. In addition, since the construction emissions are temporary and transient, the New Mexico Health and Environment Department would not consider the SO_2, CO, and TSP concentrations as significant impacts (Dhawan 1984, personal communication). The Arizona Department of Health Services (Leverock 1984, personal communication) and Texas Air Control Board (Willis 1984, personal communication) were also contacted and are of the opinion that predicted project concentrations would not constitute significant impacts. The maximum 24-hour TSP concentration is estimated to be 5.0 $\mu g/m^3$ at the Guadelupe Mountains National Park which is the nearest Class I area (located approximately 650 yards from the pipeline). The maximum 3-hour SO_2 concentration is 2.5 $\mu g/m^3$ at the nearest point of the national park. Thus no significant impacts are expected in the Class I area.

Operation. The operation of the final pipeline segment from Blythe to McCamey would consist of nine pumping/heating stations located through Arizona, New Mexico, and Texas. Since natural gas-fired turbine pumps would be used in Arizona, maximum emission concentrations would occur at the Gila and Coolidge pump stations. Summarized emissions are in Appendix A, Table A-11. Again, the majority of emissions would be NO_x from the natural gas firing of the turbines and heaters. CO and HC would also be emitted with only a trace of TSP and SO_2 emissions.

Due to the source configurations, maximum modeled impacts occurred approximately 100 yards from the source. The summary of maximum projected concentrations can be found on Table 4-2. The maximum predicted annual NO_2 concentration at the Gila and Coolidge pump stations of 23.1 $\mu g/m^3$ would be well under the standard of 100 $\mu g/m^3$. Again, no significant air quality impacts from SO_2, CO, or TSP would be generated from the operation of pump stations from Blythe to McCamey. Maximum project concentrations for SO_2 and TSP for all averaging times were below 1 $\mu g/m^3$. The maximum predicted 1 and 8-hour CO concentrations were 108 and 97.1, respectively. These are less than 1 percent of their respective New Mexico and Federal standards.

Summary. Based on air quality modeling some violations of applicable air quality standards would occur from pipeline construction or operation. Violations would occur because the pipeline would cross areas where baseline conditions already exceed standards for certain pollutants; however, the pipelines' contributions to total ambient concentrations would be less than 10 percent for all pollutants. In addition, all of the Federal and state permitting offices contacted were of the opinion that no significant impacts would occur during the construction phase, due to the transient nature of the emission sources, and during the operational phase, due to the relatively low emissions from the pumping stations.

4.2.2 Geology

The impacts discussed for geology include both geologic hazards and impacts of the project on the geologic environment. Geologic hazards are summarized in Table 4-4 and are located on Map 1-2. Geologic hazards and impacts are classified as significant or not significant based on the degree of impact as measured against scientific and social (or human) criteria. The following conditions along the pipeline ROW would be considered significant:

<u>Geologic Hazards</u>

- Slope instability or unstable cuts-and-fills leading to damage or failure of the pipeline. Significance criteria include conditions ranging from those which lead, at least, to a requirement for special maintenance in order to prevent possible damage to or failure of the pipeline, to those involving such severe landslide conditions that the pipeline should be rerouted in order to avoid them.

- Surface fault rupture leading to damage or failure of the pipeline. Significance criteria are based on the level of probability indicated by historical precedent and paleoseismologic evidence, that fault movement leading to damage or failure of the pipeline would occur at a fault crossing by the pipeline. In general, faults with historical records of surface offset of more than a few inches, such as the San Andreas fault, are of greatest significance. Ancient bedrock faults are not significant with regard to any potential for surface rupture.

- Earthquake-induced strong vibratory ground motion capable of damaging the pipeline directly. In general, only very strong near-field ground motion could affect the pipeline itself. Ancillary facilities such as pumping and heating stations and oil-holding transfer tanks are more sensitive and could be significantly damaged by ground motion from earthquakes originating at intermediate distances, depending on design parameters and foundation conditions. The effects of low-amplitude long-period ground motion from distant earthquakes would not be significant.

- Secondary seismic effects, especially earthquake-induced ground failure, including liquefaction of water-saturated granular alluvial soil. Significance is based on the potential for ground failure resulting in damage to or failure of the pipeline or of any critical ancillary facility.

- Subsidence or grade collapse resulting in enough elevation change to affect pipeline grade and elevation of pumping stations.

TABLE 4-4

GEOLOGIC HAZARDS ALONG THE CELERON/ALL AMERICAN AND GETTY PIPELINE ROUTES

Map Code	Applicant[1]	Location	Geologic Hazard
G1	C/A, G	Gaviota Gorge approximately 3/4 mile south of intersection Highways 1 and 101	Surface fault rupture
G2	C/A, G	Cañada de Las Cruces approximately 1/2 mile north of intersection of Highways 1 and 101.	Landsliding
G3	C/A, G	Cañada de Las Cruces approximately 1 mile north of intersection of Highways 1 and 101.	Landsliding
G4	C/A, G	Cañada de Las Cruces approximately 2 miles north of intersection of Highways 1 and 101.	Landsliding
G5	G	Nojoqui Canyon approximately 3/4 mile north of Live Oak Ranch	Landsliding
G6	G/A, G	Santa Ynez River/Zaca Creek floodplains from confluence of Nojoqui Creek to confluence of Cañada Botella (approximately 4 miles).	Liquefaction/lurching
G7	G	Zaça Creek about 1/2 mile south of confluence of Cañada Botella	Landsliding
G8	C/A	Sisquoc River floodplain and channel	Liquefaction/lurching
G9	G	Sisquoc River floodplain and channel	Landsliding
G10	C/A	La Brea Creek approximately 1½ miles downstream of confluence of North and South Forks La Brea Creek	Landsliding
G11	C/A, G	La Brea Canyon immediately downstream of confluence of North and South Forks La Brea Creek	Landsliding

TABLE 4-4 (CONTINUED)

Map Code	Applicant[1]	Location	Geologic Hazard
G12	C/A, G	Sierra Madre Mountains from about 2½ miles north of confluence of North and South Forks La Brea Creek to about 1 mile northeast of Treplett Mountain	Landsliding
G13	SM	Sisquoc River floodplain and channel	Liquefaction/lurching
G14	SM	On slope west of quarry near confluence of Suey Canyon with Tepusquet Canyon	Landsliding
G15	SM	Suey Canyon approximately 2½ miles upstream of confluence with Tepusquet Canyon	Landsliding
G16	SM	Suey Canyon divide about 1-3/4 miles east-northeast of Las Coches Mountains	Landsliding
G17	SM	Cuyama River Gorge from Buckhorn Canyon to approximately 1 mile northeast of Glines Canyon	Landsliding
G18	SM	West end of Cuyama Valley approximately 1/2 mile south of mouth of Cuyama River Gorge	Landsliding
G19	SM	West end of Cuyama Valley from river crossing for approximately 4 miles east	Liquefaction/lurching
G20	C/A, G	East half of Cuyama Valley from Bates Canyon to about 1 mile east of intersection of Highways 166 and 33 (approximately 18 miles)	Liquefaction/lurching
G21	C/A, G	San Emigdio Mountains approximately 4 miles northeast of intersection of Highways 166 and 33	Surface fault rupture
G22	C/A, G	Southern San Joaquin Valley from approximately 4 miles southeast of Maricopa to approximately 5 miles east-northeast of Wheeler Ridge (approximately 42 miles)	Liquefaction/lurching

TABLE 4-4 (CONTINUED)

Map Code	Applicant[1]	Location	Geologic Hazard
G23	C/A	Tejon Creek Valley (approximately 1 mile)	Liquefaction/lurching
G24	C/A	Cummings Valley, Brite Valley and westernmost Tehachapi Valley (approximately 4 miles)	Liquefaction/lurching
G25	C/A	Oak Creek Pass approximately 6 miles due west of Mojave	Surface fault rupture
G26	C/A	Mojave River floodplain and channel at Barstow (approximately 2 miles)	Liquefaction/lurching
G27	C/A	Palo Verde Valley from Mesaville to Blythe and from Nicholls to Blythe, and Colorado River floodplain and channel (approximately 10 miles total)	Liquefaction/lurching
G28	C/A	Gila River floodplain and channel	Liquefaction/lurching
G29	C/A	Coolidge area, from Randolph for approximately 14 miles southeast	Subsidence
G30	C/A	San Pedro River floodplain and channel	Liquefaction/lurching
G31	C/A	Sulphur Springs Valley approximately 6 miles northwest of Willcox (approximately 6 miles)	Subsidence
G32	C/A	San Simon Valley about 4 miles southeast of Bowie (approximately 8 miles)	Subsidence
G33	C/A	Rio Grande River floodplain and channel (approximately 8 miles)	Liquefaction/lurching
G34	C/A	Delaware Basin from Delaware River crossing for approximately 23 miles to east	Solution collapse
G35	C/A	Pecos River floodplain and channel	Liquefaction/lurching

[1]C/A = Celeron/All American G = Getty SM = Santa Maria Canyon Alternative

- Secondary effects of subsidence, especially those resulting in sharp elevation changes or loss of support that could result in damage to or failure of the pipeline or of any critical ancillary facility.

- Debris flow effects including dislodging, burial, or severe damage to the pipeline or any critical ancillary facility.

Impacts on Geologic Environment

- Existence of paleontological resources or unique geologic features or outcrops.

- Active mining operations or proposed mineral/energy development requiring avoidance by the pipeline.

- Presence of federally controlled mineral resources which would be precluded from future development by the pipeline or ancillary facilities.

- Large scale topographic alterations resulting in significant related impacts (visual degradation, soil erosion, drainage alteration, etc.)

4.2.2.1 Las Flores to Emidio

Geology and Physiography. Excavation and grading associated with construction of the pipeline and pump stations would result in temporary (construction period) and permanent changes in topography, and in minor disturbance of geologic units. However, the anticipated scale of grading operations associated with trench excavation and backfill, and cuts and fills at pump stations, would be minor. Thus, no significant impacts to the geology and physiography would occur.

Seismicity and Faulting. There are a number of hazards associated with the active seismotectonic environment traversed from Las Flores to Emidio. These can be subdivided into two major categories: strong ground shaking and surface fault rupture. Strong ground shaking can result in one of several secondary seismic effects including: liquefaction, lurching or spreading, compaction, and slope instability. These various seismically related hazards are discussed in the following section in terms of the potential for serious damage to project facilities leading to oil spillage. The oil spill impacts are discussed for each resource that could be affected in their respective sections.

The likelihood of moderate to locally very strong ground shaking must be regarded as relatively high during the design life of the pipeline and ancillary facilities. The Las Flores to Emidio segment lies within Zones 3 and 4 of the UBC Seismic Risk Map (International Conference of Building Officials 1983). These zones are characterized as having the potential for major damage with Modified Mercalli intensities of VII and higher. Zone 4 is determined by the proximity to certain major fault systems. Algermissen et al. (1982) predict a 10 percent probability of horizontal accelerations in rock ranging from

0.40 to 0.65g (see glossary) during any 50-year period in this region (see Map 4-1). Greensfelder (1974) estimates maximum credible rock accelerations of about 0.5g.

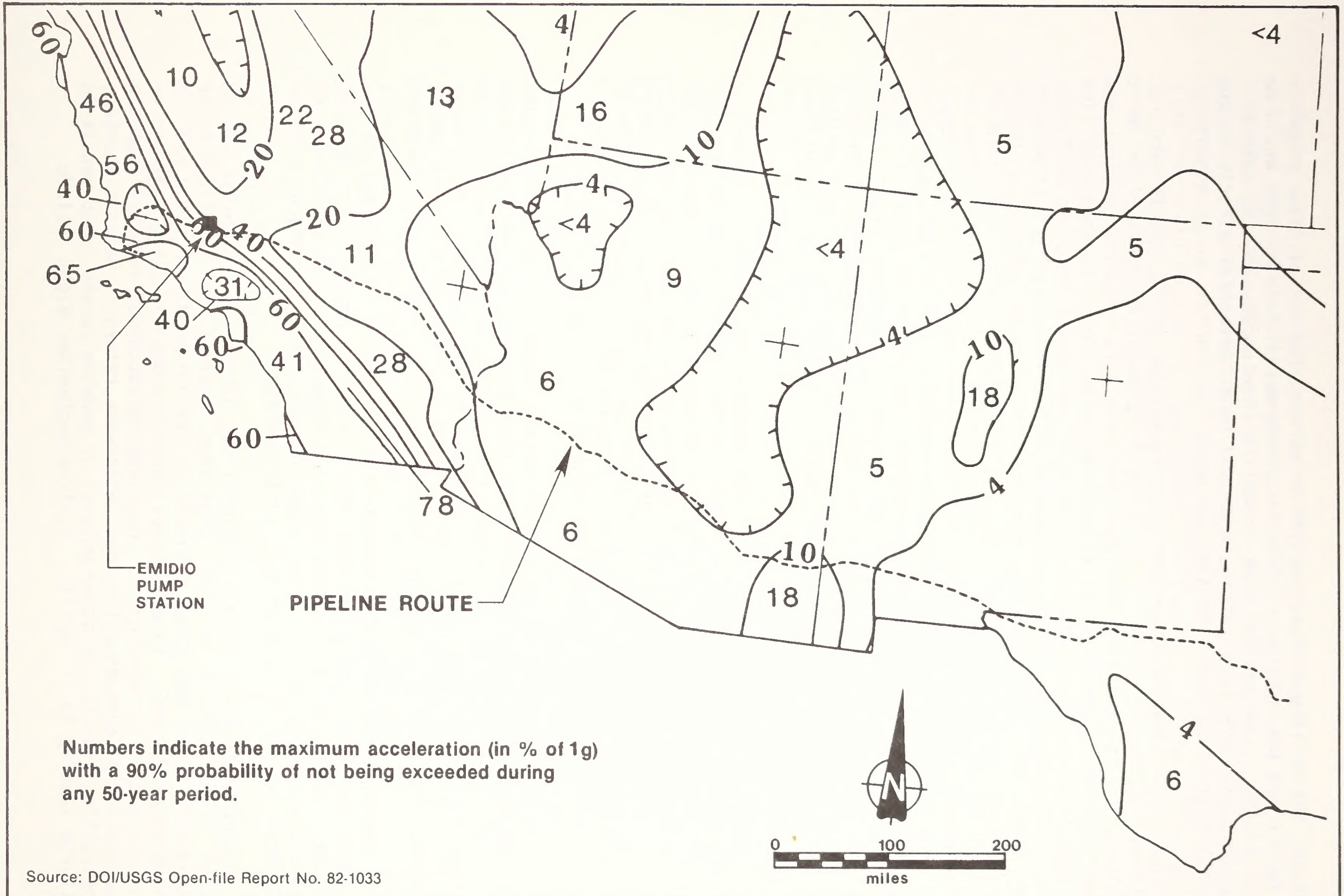
As a general rule, ground shaking will be most severe close to the fault on which the earthquake occurs. Faults with the highest probability of producing damaging earthquakes include the San Andreas east of Cuyama and the Santa Ynez near Gaviota Gorge. Seismic zonation taking this effect into account is presented for Santa Barbara County and adjacent areas to the northeast by Livingston and Associates/Moore and Taber (1979).

The potential effects of strong shaking depend largely on the characteristics of the various project facilities. The buried pipeline would be least sensitive to vibratory shaking because it is flexible enough to deform with the surrounding soil. Above-ground facilities, would be much more susceptible to vibratory damage. In general, the low pump station buildings would be relatively resistant to damage. However, the pumps, piping, and valves could be subject to amplified vibrations leading to failure.

In terms of potential hazard to the pipeline, secondary seismic effects triggered by strong ground shaking are often more serious than the shaking itself. Soil liquefaction, lurching or spreading, and dynamic compaction are related phenomena which may occur in unconsolidated (loose), saturated soils subjected to moderate to strong ground shaking. Areas along the alignment judged susceptible to these types of behavior are shown on Map 1-2. The most susceptible areas include the young sandy alluvial deposits of the Santa Ynez, Sisquoc, and Cuyama Rivers. Young alluvial fan deposits flanking the eastern portion of the Cuyama Valley and in the southern San Joaquin Valley are susceptible where they are saturated near surface (due to irrigation or shallow groundwater) and sufficiently loose. Buwalda and St. Amand (1955) document areas near the pipeline alignment in the vicinity of Mettler that underwent this type of failure during the 1952 Kern County earthquake. It is important to understand that portions of the routes within the delineated areas may be safe from liquefaction-related hazards, while local areas outside them may be susceptible. Detailed studies, as recommended in Section 4.10, are required to refine the areas subject to these hazards.

The loss of ground support or ground movement resulting from liquefaction-related behavior could lead to no effect, bending, or rupture of a buried pipe, depending on specific site conditions. Rupture would only occur if a large deflection of the pipe occurred. In general, the longer the zone of ground deformation, the more serious the results. The more localized the effects, the better the strong steel pipe is able to resist the resulting stresses.

Moderate to strong ground shaking can trigger renewed movement or enlargement of existing landslides and induce new failures on susceptible slopes. In this situation the pipelines could be lifted and sheared. The likelihood of rupture would be governed by the amount of



MAP 4-1 SEISMIC HAZARD MAP

offset, the ability of the pipeline to stretch (amount of "free play" or "slack") and the nature of the surrounding material (e.g. rock would be more likely to shear the pipe by uplift than unconsolidated material. The risk of these types of failures and their potential effects on the pipeline are discussed in the following section on slope stability.

The last important seismic hazard involves surface fault rupture. Although it is difficult to quantify the probability of surface fault rupture, it is generally accepted that the more recently a fault has moved, the more likely it is to move again in any given period of time in the future. The State of California has identified certain faults which are judged sufficiently capable of surface rupture in the short term (tens of years) that they deserve special study and design before human-occupancy structures can be built in their vicinity [California Divison of Mines and Geology (CDMG) 1976a]. Among other criteria, evidence of Holocene offset is sufficient to cause a fault to be zoned. Some workers have suggested that the probability of a fault moving in any given year is roughly one divided by the number of years since it last moved [Engineering Decision Analysis Company (EDAC) 1979; Jack R. Benjamin and Associates (JBA) 1980]. Using this model, there is something like a 1 in 100 chance of a historically active fault moving, but less than about a 1 in 10,000 chance for offset on a pre-Holocene fault in any given year.

Of the geologically young (Quaternary-age) faults listed on Table 3-3 only the San Andreas (shown on Map 1-2) is zoned by the CDMG at the crossings of the applicants' proposed routes. Although not zoned, there is sufficient evidence to regard the South Branch Santa Ynez fault as having a probability of offset during the pipeline life on the order of, or greater than, 1 in 10,000 per year. The probability of surface rupture on the other Quaternary faults from Las Flores to Emidio is uncertain, but judged by the EIR team to be quite low.

Surface offset of the San Andreas fault during a large earthquake is judged sufficiently probable to require specific mitigation as described in Section 4.10. Movement would likely be horizontal with the ground on the southwest side of the fault moving northwest relative to the opposite side of the fault (i.e., right-lateral offset). The amount of movement is difficult to predict, but could be as much as 10 to 30 ft based on past behavior (Sieh 1978). Without special design provisions, this amount of offset would almost certainly result in rupture of the pipeline with oil spillage and the resultant impacts (see Section 4.2.15). Much smaller offset would be expected on the South Branch Santa Ynez fault due to its significantly shorter length and its structural character as a splay of a larger fault.

<u>Slope Stability</u>. Impacts associated with slope instability would result from rupture of the pipelines. Areas of existing slope instability which may pose a threat to the integrity of the pipelines are shown on Map 1-2. Landslides of various types and sizes exist on or near the routes in these areas. Continued movement of active slides, or reactivation of dormant slides due to intense rainfall, seismic shaking, construction grading, or other natural or manmade causes could result in failures leading to oil spills. Failure mechanisms might include

shearing of the pipeline due to differential movement of the ground, loss of support due to movement of soil from beneath the pipe, or crushing of the pipe by overriding soil and/or rock. It is also possible, if not somewhat more likely, that slope failures would develop progressively so that repair to a damaged or threatened portion of the pipeline could be made before rupture occurred. In areas characterized by existing landslides the risk of continuing or renewed slope failure must be regarded as relatively high.

In addition to reactivating existing slides, new natural landsliding may occur in similar geologic units on slopes subjected to destabilizing conditions. This would include enlargement of existing slides, as well as separate new slides. The main factors which could lead to new natural instability would be undercutting slopes by erosion, excessive rainfall, and seismic shaking, acting either separately or together. The risk of these types of failures is judged moderate for enlargement of existing slides, and moderate to low for completely new natural slides along the applicants' proposed routes. Areas within the Sierra Madre Mountains underlain by severely fractured and shattered sandstone and shale are most susceptible to new failures (see Map 1-2).

Landslides associated with permanent cut and fill slopes created during grading operations could result in structural failure of the pipe. Instability of temporary construction slopes or trench excavations, while important to safety and constructability, would not trigger impacts related to oil spillage. Impacts associated with temporarily increased sedimentation could result from instability of either permanent or temporary slopes (see discussion in Section 4.2.3). Proper geotechnical design would result in relatively low risk of these types of failures.

Subsidence. The risk of significant impacts due to subsidence-related failure of the pipeline, pump stations, or storage facilities is low. Major historic subsidence in the Maricopa-Mettler area has been essentially eliminated. Renewed subsidence could occur if groundwater overdraft were permitted in the future. Subsidence associated with deeper oil and gas withdrawals is monitored and controlled by the California Division of Oil and Gas and should not pose any threat to the project facilities.

Paleontology. It is possible that well preserved fossils would be encountered in trench excavations in geologic units which are known to be highly fossiliferous at other localities. The likelihood of exposing unique specimens of great paleontologic significance is, however, thought to be low. The requirements in California and Federal statutes, including a paleontological survey of highly fossiliferous areas crossed by the proposed ROW, would help minimize potential adverse impacts to any significant paleontologic resources.

Unique Geologic Features. No significant impacts to unique geologic features are anticipated.

Mineral/Petroleum Resources. No significant adverse impacts to mineral or petroleum resources would occur in this portion of the route. The volume of sand and gravel which might be excluded from possible future extraction at the Santa Ynez and Sisquoc River crossings would be insignificant in comparison to the total resource in the immediate area. The presence of existing large-scale diatomite quarries in nearby Lompoc make it unlikely that the privately owned deposit traversed by the applicants' routes would be developed in the foreseeable future. If this deposit is eventually developed, the pipelines would not significantly reduce the recovery of the mineral. The pipelines would have no significant impact on oil and gas extraction in the operating fields traversed.

4.2.2.2 Emidio to Blythe

Geology and Physiography. Impacts would be the same as described in Section 4.2.2.1.

Seismicity and Faulting. Much of the background discussion of seismicity and faulting in Section 4.2.2.1 has application to this section. The following paragraphs discuss specific aspects of the topic applicable to the applicant's proposed route from Emido to Blythe.

In general, the level of hazard due to strong ground shaking is present, but to a somewhat lesser degree than from Las Flores to Emidio. The UBC zoning is the same (Zones 3 and 4), but Greensfelder (1974) estimates maximum credible accelerations of less than 0.2g southeast of about Amboy, as opposed to 0.4 to 0.5g to the west. East of Mojave, Algermissen et al. (1982) anticipate only 0.1 to 0.2g as the maximum acceleration with a 90 percent probability of not being exceeded during any 50 year period (see Map 4-1). Thus, at least from Amboy to Blythe, hazards from shaking can be regarded as low to moderate. As a general rule, ground shaking will be most intense near the White Wolf or Garlock faults, which are the most likely sources of damaging earthquakes.

Secondary seismic effects would be most likely to occur in those portions of the upland valleys of the Tehachapi Mountains locally underlain by sandy alluvium which is saturated near the ground surface due to irrigation or along drainage courses or streams (see Map 1-2). The alluvial deposits of the Mojave River and the Palo Verde Valley near Blythe would also be susceptible (see Map 1-2), but to a lesser degree due to the less intense shaking anticipated. Due to infrequent saturation and generally favorable drainage characteristics, sandy deposits along the remainder of the route would be unlikely to experience potentially damaging secondary effects.

Slope instability triggered by strong ground shaking may occur locally on the steeper flanks of the Tehachapi Mountains with the effects noted in the following section on slope stability. The remainder of the route to Blythe would not be seriously threatened by this hazard.

Of the Quaternary faults listed on Table 3-3, the only one considered reasonably capable of sufficiently large surface offset to rupture an unprotected pipeline would be the Garlock Fault west of Mojave (see Map 1-2). This fault is zoned by the State of California (CDMG 1976f) and may have undergone up to 6 inches of offset in response to the 1952 Kern County earthquake (Buwalda and St. Amand 1955). Although the probability of surface rupture is less on the Garlock than the San Andreas due to the formers lack of major historical seismicity and offset, the amount of offset resulting from a maximum credible earthquake on the Garlock fault could exceed 10 to 20 ft. Surface fault rupture did not occur on the White Wolf fault in the vicinity of the pipeline crossing during the 1952 magnitude 7.7 earthquake. Since that size earthquake is regarded as a maximum credible event for the White Wolf fault (Greensfelder 1974), it is very unlikely that surface faulting will occur at the pipeline crossing during the project life. Although portions of this fault to the northeast and southwest are zoned, geologic data (even following the 1952 earthquake) are not present to allow extending the surface fault rupture hazard zone through the pipeline crossing area (CDMG 1976,c,d,e).

There have been reports of Holocene and historic surface rupture on several faults in the central Mojave Desert (Beebey and Hill 1975; Keaton and Keaton 1977; Hawkins and McNey 1979; Hill et al. 1980). Although none of these faults would be crossed by the route, they have similar geologic characteristics to, and occur within the same seismotectonic environment as, the Quaternary faults without Holocene offset in Table 3-3. Available evidence suggests that relatively little, if any, serious damage would have been sustained by a steel pipeline as a result of the reported fault movements.

<u>Slope Stability</u>. The risk of damage leading to oil spillage from natural slope instability is very low due to the generally favorable climatic, geologic, and geomorphic conditions in this portion of the applicants' proposed route. Potential damage due to erosion and sedimentation triggered by flooding is discussed in Section 4.2.3.

Grading at pump stations in this segment should result in relatively low cut and fill slopes. Such slopes would pose very little, if any, hazard to project facilities. Instability of temporary construction slopes or trench excavations, while important to safety and constructability, would not lead to oil spillage and resultant impacts.

<u>Volcanism</u>. The risk of serious damage to the pipeline from renewed volcanic activity in the Pisgah and/or Amboy volcanic fields (see Map 1-2) is judged to be very low on currently available information, including very recent studies of the generally similar Cima volcanics to the north.

<u>Paleontology</u>. It is possible that well preserved megafossils would be encountered in trench excavations in certain of the geologic units traversed. However, the likelihood of exposing unique specimens of great paleontologic significance is unknown. The requirements in California and Federal statutes for protection of important

paleontologic resources, including a paleontological survey of highly fossiliferons areas crossed by the proposed ROW, would help minimize any potential adverse impact.

Mineral/Petroleum Resources. No significant adverse impacts to current development or planned extraction of mineral or petroleum resources are anticipated. The route does not traverse properties of Proposed Mineral Producers or Highly Probable Production Areas identified by the BLM (1982), nor the proposed SCE solar pond project on Danby Lake (Hayes 1984, personal communication).

As summarized on Table 3-6, the route does cross leasable mineral resource areas on Federal land. There is some possibility that future mineral development utilizing surface mining techniques could encroach on the pipeline ROW. If necessary, re-routing or re-design of a portion of the pipeline could be implemented to provide access to federally-controlled mineral resources.

4.2.2.3 Blythe to McCamey

Geology and Physiography. Impacts would be the same as discussed in Section 4.2.2.1.

Seismicity and Faulting. As discussed for the Sohio Project (BLM 1976 pp. 2-10 of 101, 3-25 to 30) and supporting documents (ERT 1976 pp. 2A.3-50 & 53), there is a relatively low risk of serious damage to the pipeline or ancillary facilities due to seismic effects from Blythe to McCamey. Areas which could experience some slope instability or secondary seismic effects (particularly liquefaction) in a major earthquake are shown on Map 1-2.

Slope Stability. The risk of serious damage to the pipeline or ancillary facilities from slope instability from Blythe to McCamey is judged negligible. The depth of burial of the pipeline in mountainous areas would prevent significant damage in the unlikely event of moderate to large rockfalls from the slopes above the alignment.

Subsidence. Subsidence due to fluid withdrawal is occurring along the applicant's proposed route at several locations in Arizona (see Map 1-2). Surface effects include subtle changes in grade over relatively long distances (up to miles), and scarps and fissures in more localized areas. Vertical offsets up to several feet high and fissures up to several feet wide and 100 or more feet deep have been reported (BLM 1976, pp. 3-24 & 25).

Although fissures and ground surface offsets of the type described may expose short sections of the pipeline over time, the strength of steel pipe is sufficient to prevent rupture until the problem can be corrected during routine maintenance. The changes in grade over longer distances are so slight that no adverse effect on the pipeline would occur. Fissuring and offsets directly beneath rigid structures such as the pump or heater stations, valves, or other appurtenant facilities could result in more significant damage due to cracking or tilting, if the condition was not discovered early on.

Karstic Terrain. An area in west Texas delineated on Map 1-2 is locally characterized by the presence of sinkholes. These are surface depressions formed by solution and collapse of underlying soluble rock. These features may subside gradually over hundreds to thousands of years, or abruptly when the underlying solution cavern reaches a critical size. In the latter case, scarps from inches to many feet high can form over a short period of time.

Possible damage from karstic collapse is generally similar to that associated with subsidence. As for subsidence, the most effective strategies are avoidance of known or suspected sinkholes and frequent surveillance for signs of incipient failure.

Volcanism. The risk of damage to the pipeline leading to oil spillage from volcanism is judged negligible along the Blythe to McCamey route (Mullineaux 1976).

Paleontology. It is possible that well preserved megafossils would be encountered in trench excavations in certain of the geologic units traversed. However, the likelihood of exposing unique specimens of great paleontologic significance is judged very low. The paleontologic resource protection requirements in Federal statutes should minimize any potential adverse impact.

Unique Geologic Features. No impact to unique geologic features is anticipated.

Mineral/Petroleum Resources. The only potentially significant impact on mineral resources would involve major spillage of oil into open sand and gravel pits and quarries adjacent to the alignment [see discussion for the Sohio Project (BLM 1976 p. 3-20)]. The likelihood of such an occurrence appears very remote as discussed in Section 4.2.15.

No other significant adverse impacts to mineral or petroleum resources would occur in this portion of the route. The volume of sand and gravel which might be excluded from possible future extraction at major river crossings is insignificant in comparison to the total resource in immediately adjacent areas. The same is true of undeveloped sulfur and potash salt deposits in Texas. The pipeline would have no significant impact on oil and gas extraction in the operating fields traversed.

4.2.2.4 Summary. No significant impacts to geologic and physiographic features would occur during construction or operation of the pipeline. Although no significant impacts are expected to occur in regard to other geological actions, certain hazards and risks are identified for seismicity and faulting and slope stability. Of these, high risks would be associated with surface rupture of the San Andreas fault, and slope failures in existing slide areas. There is a moderate risk of liquefaction-related failures, particularly at major river crossings along the Las Flores to Emidio segment. Pump and heater/pump stations, and valves would potentially be affected by subsidence from fluid withdrawal or karstic collapse.

4.2.3 Soils

The impacts discussed for soils are classified as significant or not significant based on the degree of impact as measured against scientific criteria. The criteria that follow are derived from regulatory standards, research information, and/or standards based on best professional judgement of resource specialists.

- Impacts to soils would be considered significant if increased erosion rates or reduction of soil productivity resulting from project activities would prevent successful rehabilitation (the process of applying mechanical and/or revegetation techniques to limit soil loss to preconstruction levels on disturbed sites) and eventual vegetation regeneration (re-establishment of pre-existing vegetation composition, density, and cover). Evaluations of successful rehabilitation are based on whether soils having severe rehabilitation constraints would stabilize with respect to erosion from all causes to near preconstruction conditions within one year following application of proposed plans and compliance with Federal stipulations for erosion control and revegetation.

4.2.3.1 Potential Impacts to Soils

Construction. With the application of the mechanical erosion control and revegetation techniques presented in the project description and site-specific techniques that will be developed as part of the Construction and Use (CU) Plan impacts to soils resulting from construction activities would not be significant. Impacts resulting from construction activities would include:

- accelerated soil erosion and deposition,
- decreased productivity from compaction and horizon mixing, and
- increased soil slumping potential.

Accelerated soil erosion in the form of sheet, rills, and gullies could result from the removal of vegetative cover, especially on moderately steep to steep slopes occurring along major portions of the route. Compaction by heavy equipment would reduce the infiltration rate and water-holding capacity of the soils, increase runoff and erosion, and adversely affect revegetation success. Horizon mixing could create chemical (salinity) and physical (compaction, difficult seedbed preparation) problems, except in irrigated cropland areas where soils would be segregated. Horizon mixing could redistribute subsurface salts into the surface layers, adversely affecting productivity. Disturbances to steep, clayey soils predisposes these areas to soil slumping which results in increased erosion, revegetation problems, and pipeline instability.

Operation. Significant adverse impacts to soils would result from oil pipeline leaks and ruptures. Contamination of soils would result in increased microbial activity and decreased water uptake and infiltration rates (Rowell 1975). Oil spills may adversely affect soil structure and consequently render the soils more susceptible to erosion (Ellis and Adams 1961). Soil productivity would be reduced within a spill area and result in a temporary decrease in vegetation production levels. The size and duration of soil impacts due to oil spills would be dictated by the extent of the spill, infiltration depth of the oil, soil characteristics, local topography, and type of vegetative cover.

Impacts from oil spills would be small in magnitude because of the limited ability of spilled oil to disperse over large areas of land. An oil spill of 15,000 barrels would likely contaminate less than 16 acres of land, based on MacKay and Mohtadi's (1975) study of 53 oil spills in Alberta, Canada, in which estimates were based on shallow soils (8 inches deep). Since most of the soils along the pipeline route are deeper than 8 inches, the maximum area disturbed by an oil spill would probably be less than 16 acres, but could be greater in extremely shallow soils on steep slopes.

Agricultural areas would be the most sensitive to oil spill impacts. The impacts in these areas would be soil contamination and subsequent loss of production. Depending on the depth of oil penetration and climatic conditions, reclamation of oil-damaged soils can take from 1 to many years following contamination (Rowell 1975, Plice 1948). Oil spill-related impacts to soils would be minimized to the extent possible. Since reclamation practices can be feasibly implemented in agricultural areas, reclamation of agricultural lands would most likely occur more quickly than in native plant communities.

Abandonment. Pipeline removal would create impacts similar to those resulting from construction. No additional impacts to soils would occur if the pipeline was abandoned in place.

4.2.3.2 Las Flores to Emidio

Adverse impacts resulting from construction activities would include accelerated soil erosion and deposition, decreased productivity, and increased soil slumping potential. Soil loss from water and wind erosion and ravelling would be accelerated by construction, especially on the steep mountainous areas of Gaviota Pass, Los Padres National Forest (LPNF), and along the flood-prone Cuyama Valley. The irrigated croplands of southwestern Kern County would be especially prone to compaction and horizon mixing problems. Increased soil slumping potential would result from construction particularly in the clayey soils common to the coastal area (Las Flores to Gaviota Pass).

Sensitive soil units for special consideration in the detailed CU plan along the Las Flores to Emidio route are described in Table 4-5 and shown on Map 1-2, Sheets 2 and 3. These areas are sensitive based on the following characteristics which are major potential problems associated with erosion control and revegetation:

- Steep slopes (e.g., Gaviota Pass area and LPNF)

- Irrigated cropland (e.g., southwestern Kern County)

- Flood-prone areas (e.g., Cuyama Valley)

- Clayey and high shrink-swell areas (e.g., Las Flores to Gaviota Pass)

- Serpentine soils (e.g., LPNF)

Significant short-term (one to two years) impacts would result from oil pipeline leaks and ruptures. The agricultural lands of southwestern Kern County and the Cuyama Valley would be the most sensitive to oil spills. The clayey soils of the coastal area are prone to slumping and shrink-swell conditions which can create instability problems for the pipeline; however, these conditions would not be caused by pipeline construction.

4.2.3.3 Emidio to Blythe

Adverse impacts resulting from construction activities would include accelerated soil erosion and deposition, and decreased productivity from compaction and horizon mixing. Soil loss from water erosion would be accelerated by construction especially on the steep slopes of the Tehachapi Mountains and along the flood-prone drainages feeding into the Tehachapi Valley. Construction activities would accelerate soil loss by wind erosion along the Mojave Desert where frequent strong winds occur. Chemical (salinity) and physical (compaction) problems in agricultural soils would result from construction in southwestern Kern County and floodplains of the Mojave and Colorado Rivers.

Sensitive soil units along the Emidio to Blythe route are described in Table 4-5 and shown on Map 1-2, Sheets 3, 4, and 5. These areas are sensitive based on the following characteristics which are major potential problems associated with erosion control and revegetation:

- Steep slopes, shallow soils (i.e., Tehachapi Mountains)

- Irrigated cropland (i.e., southwestern Kern County, Barstow, and Blythe)

- Flood-prone areas (i.e., Tehachapi Valley, Mojave, and Colorado Rivers)

Significant short-term (one to two years) impacts would result from oil pipeline leaks and ruptures as discussed in Section 4.2.3.1. The agricultural lands of southwestern Kern County, Barstow, and Blythe would be the most sensitive to oil spills.

4.2.3.4 Blythe to McCamey. Adverse impacts resulting from construction would be accelerated soil erosion and deposition and decreased productivity from compaction and horizon mixing. Although the majority of this route crosses level to gently sloping terrain, the steep slopes of isolated mountains (i.e., Kofa, Winchester) would

TABLE 4-5

MAJOR SENSITIVE SOIL UNITS

Map Code	Location	Sensitive Characteristics	Significant Risks	Representative Soil Series
Celeron/All American and Getty				
California				
S1	Las Flores to Gaviota Pass	Steep slopes, clayey textures	Water erosion, soil slumping, high shrink-swell	Ayar, Capitan, Diablo
S2	Gaviota Pass to south of Santa Ynez River	Steep slopes, depth to rock,[1] clayey textures	Water erosion, revegetation, soil slumping	Los Osos, Linne, Diablo, Gaviota, sedimentary rockland
S3	North of Zaca Creek and Dry Creek confluence	Steep slopes, depth to rock[1]	Water erosion and revegetation	Santa Lucia
S4	South of Sisquoc River to LPNF boundary	Steep slopes, depth to rock,[1] clayey textures	Water erosion, revegetation, soil slumping	Lopez, Los Osos
S5	LPNF	Steep slopes, depth to rock,[1] occasional flooding (La Brea Creek), serpentine soils	Water and wind erosion, ravelling and deposition, revegetation, some soil slumping	Los Osos, Millerton, Millsholm, Serpentine soils
S6	Cuyama Valley	Strongly saline some irrigated cropland subject to flooding	Revegetation, horizon mixing, water erosion and deposition, compaction	Stutzville Metz, Cobbly alluvial land
S7	Emigdio Mtns.	Steep slopes	Water erosion	NA[2]
S8	San Joaquin Valley (southwestern Kern Co.)	Salinity, perched water table in irrigated croplands	Mixing of surface and subsurface soils leading to salinity problems at surface, compaction	Arvin, Hesperia
Celeron/All American				
S9	Tehachapi Mtns	Very steep slopes, depth to rock[1]	Water erosion, revegetation	Arujo, Friant, Tunis, Chanac-badland complex
S10	Tehachapi Valley (Water, Blackburn, Mendleburu, Antelope Canyons)	Subject to flooding	Water erosion and deposition	NA
S11	Mojave River floodplain	Subject to flooding, irrigated croplands	Water erosion and deposition, compaction, horizon mixing	Villa, Victorville

TABLE 4-5 (CONTINUED)

Map Code	Location	Sensitive Characteristics	Significant Risks	Representative Soil Series
S12	East of Tehachapi Mtns. to west of Blythe (Mojave Desert)	Coarse-textured surface layer	Wind erosion, compaction	Cajon, Manet
		saline/alkaline, clayey textures	Flash flood potential - water erosion, wind erosion	Bousic, playas, desert pavement
S12W	East of Tehachapi Mtns. to west of Blythe (Mojave Desert)	Fine-textured soils	Susceptible to high wind erosion	Dunes, sand covered fans, dry lake beds
S13	Old Woman Mtns. (Desert Alternative)	Steep slopes	Water erosion	NA
S14	Blythe vicinity	Perched water table in irrigated croplands, subject to flooding	Mixing of sandy topsoils and clay subsoils will create physical problems (compaction, puddling)	Meloland Carrizo
<u>Arizona</u>				
S15	Colorado River	Subject to flooding	Water erosion and deposition, compaction	Gilman, Antho, Vint
S16	Kofa Mtns., Dome Rock Mtns.	Steep slopes, depth to rock[1]	Water erosion, revegetation	Lomitas and Cherioni
S17	Eagletail Mtns.	Steep slopes, depth to rock[1]	Water erosion, revegetation	Lomitas and Cherioni
S18	Harquahala Plain (Centennial Wash)	Subject to flooding, agricultural lands	Water erosion and deposition, compaction, horizon mixing	Gilman, Antho, Vint
S19	Gila River near Gillespie Dam	Subject to flooding, agricultural lands	Water erosion and deposition, compaction, horizon mixing	Gilman, Antho, Vint
S20	Between Randolph and Rainbow Valley	subject to flooding, agricultural lands	water erosion and deposition, compaction, horizon mixing	Gilman, Antho, Vint
S21	North of Tortolita Mtns. and E. of Picacho Mtns.	Subject to flooding	Water erosion and deposition, compaction	Gilman, Antho, Vint
S22	Santa Catalina Mtns. near Oracle	Moderately steep to steep slopes	Water erosion, revegetation	Caralampi, Latene, Nickel, House Mountain

TABLE 4-5 (CONTINUED)

Map Code	Location	Sensitive Characteristics	Significant Risks	Representative Soil Series
S23	Winchester and Dos Cabazos Mtns.	Steep slopes, depth to rock[1]	Water erosion, revegetation	Faraway, Luzena
S24	North of Wilcox Dry Lakebed	Sodic/saline	Water and wind erosion, revegetation	Gothard, Crot
S25	East of San Simon	Steep slopes, depth to bedrock[1]	Water erosion, revegetation	House Mountain, Nickel
New Mexico				
S26	Animas Valley	Alkalinity	Revegetation	Hondale, Mimbres
S27	Deming area and north of Florida Mtn.	Agricultural lands	Horizon mixing, compaction	NA
S28	East of Florida Mtns. and west of Aden	Coarse-textured surface layer	Wind erosion	Pintura
S29	Doña Ana County between Aden and Chamberina	Coarse-textured surface layer	Wind erosion	Cacique, Pintura
S30	Rio Grande River	Subject to flooding irrigated cropland	Water erosion and deposition, compaction, horizon mixing	Gila, Vinton
Texas				
S31	West of Hueco Mtns. and east of Newman	Coarse-textured surface layer	Wind erosion	Hueco, Wink
S32	Salt Basin - west of Guadalupe Mtns.	Alkalinity	Revegetation, flooding	Holloman, Reeves, Hoban
S33	Pecos River	Subject to flooding	Water erosion and deposition, compaction	Gila
S34	Between Pecos River and Kermit	Coarse-textured surface layer	Wind erosion	Wichett, Pyote

Source: ERT

[1]Depth to rock less than 20 inches.

[2]Not Applicable

present accelerated water erosion problems as a result of construction activities. Construction would result in accelerated wind erosion especially in those soils with coarse-textured surface layers and in the saline/alkaline soils of fine textures (playas). Compaction and soil horizon mixing impacts from construction activities would decrease soil productivity, especially in agricultural areas.

Sensitive soil units along the Blythe to McCamey pipeline route are described in Table 4-5 and shown on Map 1-2, Sheets 5 through 12. These areas are considered sensitive based on the following characteristics which are major potential problems associated with erosion control and revegetation:

- Steep slopes, shallow soils (i.e., Kofa and Winchester Mountains)
- Irrigated cropland (i.e., Gila, Rio Grande Rivers)
- Flood-prone areas (i.e., Colorado, Gila, Pecos, Rio Grande Rivers)
- Saline/alkaline areas (i.e., Animas Valley, Wilcox Playa, Salt Basin)

Significant short-term (one to two years) impacts would result in the event of an oil spill as discussed in Section 4.2.3.1. The major croplands of Rainbow Valley and Deming, and along the Gila and Rio Grande Rivers would be the most sensitive to oil pipeline leaks and ruptures.

4.2.3.5 Summary. Impacts to soils would occur as a result of construction and operation of the proposed pipeline. These include accelerated soil erosion, decreased productivity from compaction and horizon mixing, and increased soil slumping potential. With Celeron/All American's and Getty's execution of sound mechanical erosion control and revegetation techniques, impacts on soil productivity from construction would not be significant. Significant short-term soil impacts including reduced soil productivity, increased soil susceptibility to erosion, and decreased water uptake and infiltration rates would result if oil spills occur (see Section 4.2.3.1).

4.2.4 Surface Water

Impacts to surface water would be considered significant if:

- Water quality was degraded to the point that it did not meet all existing state and Federal standards.
- The quantity or quality of discharges from streams were modified by water withdrawals, instream construction, or accidental contamination (e.g., oil spills) to the extent that water used by established users (e.g., public water supplies and irrigation) is measureably reduced; critical aquatic habitats support reduced fish populations; or the water quality is in violation of state water quality criteria.

- Channel geometry or gradients were altered sufficiently to produce undesirable effects such as aggradation, degradation, or sidecutting.

- Any permanent above-ground facilities were constructed within the 100-year flood plain (consistent with Executive Order 11988).

- Sedimentation downstream of pipeline crossings affects the operation of irrigation water control structures.

4.2.4.1 Potential Impacts on Surface Water

Construction. Potential significant impacts of pipeline construction would be increased sediment yield from areas disturbed during construction and localized channel aggradation/degradation. USFS Best Management Practices will be implemented on National Forest lands to reduce sediment yield.

Construction earthwork near the stream channel would create the potential for soil erosion and the subsequent increase of sediment loads in the stream. Construction activities in the stream channel would create the potential for additional sediment in the stream and changes in channel geometry. Geometry changes (reduction in the cross sectional area of the channel) would be significant because the result can be reduction in the ability of the channel to convey commonly occurring discharges. Aggradation or degradation of the channel may also occur.

A decrease in water quality would be expected due to a major increase in sediment loads during pipeline construction. The increase in sediment loads would be temporary and decrease to preconstruction levels within a short time (up to two weeks) after construction is completed. No significant impacts to stream water quality or irrigation water control structures are expected.

Construction of above ground structures within the 100-year flood plain is not planned at this time. Significant impacts are not anticipated.

Impacts to surface water resources caused by the discharge of hydrostatic test water are not expected to be significant. The water would be tested and treated before it is released. The water would be released in a controlled manner such that natural waterways would not be degraded.

Other possible impacts due to construction activities would be spills of lubricating oils or equipment fuels. Impacts due to spills of this nature would be of small areal extent but significant, particularly if the spill occurred in a small watercourse.

Operation. The most significant impact on surface water would result from crude oil spilled into a watercourse from a pipeline leak or rupture. A spill resulting from a small leak may involve as much as 500 barrels of oil before being detected. The amount of oil involved in a large spill would be the volume in the pipeline between the break and the nearest block and check valves on either side. The amount of oil which would flow through the line until the safety equipment shut the pipeline down must also be included. Oil spill volume estimates for sensitive streams range from 1,750 to 4,800 barrels (Table 4-26). Small streams would be temporarily overwhelmed by this quantity of oil and larger streams would carry the oil many miles downstream.

Water quality would be degraded by more volatile fractions of the oil going into solution. Depending on the flow regime at the time of the spill, oil could be incorporated into the sediment or the stream bottom so that some oil would be released after the spill was originally cleaned up (EPA 1982b). Duration of the water quality impacts would probably be only a few weeks after the oil was cleaned up, particularly on larger streams with a large enough flow to dilute oil remaining after cleanup. Water polluted with crude oil would be unsuitable for domestic or irrigation use.

The pipeline could also be affected by scour and natural channel geometry changes over its operational life. During large flow events, the moving water could move large quantities of bed material (scour) and uncover the pipeline. This is undesirable not only because the possibility exists that a pipeline break may occur (only on the largest streams), but also because the pipe may act as a dam, catching trash and flooding surrounding areas. Activities changing the geometry of the stream channel up or downstream from a pipeline crossing may eventually cause a change at the crossing. An example of this would be gravel mining in the channel in the vicinity of a crossing. Removal of mined material could cause activation of the channel upstream or downstream from the mined area as the stream moves material to establish a new average bed gradient. The bed at the pipeline crossing may be raised or lowered. If the bed were lowered, the pipeline could be uncovered.

Abandonment. If the pipeline were removed at the end of its service life, impacts would be similar to those described under construction. If the pipeline were purged of all oil and contaminants and simply abandoned, there would be no effect in a stable channel. If the channel begins to degrade, there is a possibility that the pipeline may be uncovered and affect the flow regime of the stream by catching sediment and trash.

4.2.4.2 Las Flores to Emidio. The following is a summary of expected impacts to the major streams crossed by this section of the pipeline.

- Santa Ynez River - Construction would occur during a short period of time during low flow. Sediment loading in the river would be increased during construction and for a few days afterward. No significant impacts due to construction are expected. When the pipeline is in normal operation no significant impacts would be expected. A pipeline rupture at or near the stream crossing would release oil into the stream. The release of oil into the stream and resulting degradation of water quality would be considered a significant impact.

Since irrigation water and municipal water supply for Buellton comes from wells, no immediate impact on these supplies would be expected from a spill into the Santa Ynez River, although groundwater pollution may result from an oil spill (Ahlroth 1984, personnal communication). If the pipeline were buried 4 ft below the 100-year scour depth it is unlikely that any single runoff event would disturb the pipeline. Degradation of the channel is evident in the reach where the pipeline would be buried and it is possible that the pipeline could be disturbed during its operational life. The disturbance of the line would increase the likelihood of a rupture or change in channel conveyance, both significant impacts.

- Sisquoc River - The impacts on the Sisquoc River would be essentially the same as those on the Santa Ynez River with the following exceptions. There are no municipal water supplies in the vicinity of and downstream from the pipeline crossing on the Sisquoc River although alluvial wells along the river are used for irrigation and individual residences. The release of oil into the stream would degrade water quality and be considered a significant impact. Gravel mining in the Sisquoc River channel downstream of the proposed pipeline crossing has resulted in continuing channel degradation. This degradation would increase the difficulty of burying the pipeline deep enough so that it would not be disturbed during its operational lifetime. Disturbance of the pipeline could result in a significant impact.

- La Brea Creek - Significant impacts to La Brea Creek would result from construction of the pipeline in La Brea Canyon. The canyon is narrow and winding, and the pipeline would have to cross the creek several times. The amount of disturbance to the stream channel could be large enough to change channel geometry and activate the channel. Sediment loadings would remain elevated until the channel reached a new average gradient. Both the change in channel geometry and elevated long-term sediment delivery would be significant impacts. Impacts relating to pipeline operation would be similar to the Santa Ynez River.

- Cuyama River - Impacts to the Cuyama River would be similar to those described for the Santa Ynez River with the exception that the channel is agrading instead of degrading. Thus, uncovering the pipeline due to channel cutting would not be a problem.

4.2.4.3 Emidio to Blythe. Few natural streams would be crossed by this segment of the pipeline; impacts to streams crossed would be similar to the Santa Ynez River. An oil spill into the Mojave River when flowing water is present would be a significant impact. The California and Los Angeles Aqueducts would be crossed in this segment. No impacts due to construction are expected on these structures. Since these waterways are municipal water supplies, any oil leakage into the aqueducts would be considered a significant impact.

4.2.4.4 Blythe to McCamey. Impacts to the rivers crossed along this segment would be similar to those for the Santa Ynez River. Construction of the pipeline across the Colorado River at Blythe would be more difficult then other crossings proposed. Laying the pipeline would require about six weeks. Once construction was completed. Elevated sediment levels caused by construction activities would decline rapidly to preconstruction levels. No changes in channel geometrics would be expected and effects of sediment generated during construction would extend only a short distance downstream.

4.2.4.5 Summary. Significant surface water impacts would occur during operation. Flooding and scour are not expected be significant impacts because the pipeline would be built to DOT regulations. However, channel degradation which uncovers the pipeline resulting in a pipeline break would cause a significant impact. A pipeline rupture would cause surface water contamination by the release of crude oil. The probability of these occurrences is very low (see Section 4.2.15). Only a small quantity of oil is needed to contaminate a water supply, and a spill into a stream would likely be quickly detected. Major spills could be cleaned up quickly. Any spill poses a significant short-term impact, but long-term impacts would not be significant.

4.2.5 Groundwater

Impacts to groundwater resources would be considered significant if:

- Potentiometric heads or gradients of aquifers were altered enough to adversely affect established water uses. The magnitude of changes required to produce adverse effects would vary with specific aquifers and water users.

- Water quality within any aquifer zone was degraded by introduction of oil or other pollutants.

4.2.5.1 Potential Groundwater Impacts. Impacts to groundwater could occur during construction, operation, and abandonment of the proposed pipeline. Shallow water-table aquifers are most susceptible to contamination. Deep aquifers are less likely to be affected because of the presence of relatively impermeable overlying layers in the case of confined aquifers, or great thicknesses of unsaturated sediment overlying deep water-table aquifers. No significant changes in potentiometric heads or gradients are expected to occur.

Sensitive areas of groundwater basins were selected based upon depth to groundwater and degree of groundwater use. These areas are described and identified on Table 3-14 and Map 1-2. The most important of the sensitive areas would be those aquifers used for public supplies, with very shallow depths to water and highly permeable soils and aquifer materials. These highly sensitive areas include the Santa Ynez River at Buellton, Mojave River at Barstow, and Rio Grande Valley near El Paso. Significant impacts may occur outside of the identified sensitive areas, but would affect aquifers of limited extent with relatively few groundwater users.

Groundwater impacts are expected to be limited to the groundwater regime in the vicinity of the pipeline and hydraulically down gradient within the affected aquifer. In the event of a spill into surface water, the oil could be carried down stream for a considerable distance before it is contained, however groundwater would not be substantially affected in downsteram aquifers if spill containment is prompt because the oil would tend to float on top of the water surface due to its lower density. A recent major oil spill which occurred on the North Platte River demonstrates this conclusion (Long 1982).

Construction. During excavation and burial of the pipeline, disruption of shallow aquifers may occur temporarily. Very localized dewatering and increased turbidity impacts would be negligible. Effects would go unnoticed except in wells immediately adjacent to the pipelines.

Hydrostatic testing of the pipeline may introduce contaminants to aquifers in the event of leakage. These contaminants could include oil and grease, rust, metal fragments and welding slag, and bacteriacides added to test water. Effects would be localized and short term since any detected leaks would be located and repaired. Disposal of hydrostatic test water would include treatment to meet NPDES permit stipulations and be at an approved disposal location.

Operation. During operation of the pipeline, significant groundwater impacts would occur only in the case of a leak or rupture of the pipeline. The probabilities of a rupture occurring are very low, as discussed in Section 4.2.15.

Relatively small amounts of oil dissolved in water could cause taste and odor problems. Concentrations of 0.1 part per million (ppm) could make water undesirable for drinking. Danger to human health from drinking oil-contaminated water is usually not a major problem because chronic toxicity concentrations are well above the levels of unpalatable taste and odor. Hydrocarbon-contaminated water would also cause adverse impacts where groundwater is used for irrigation, livestock, and industrial uses.

Leaks in the pipeline have higher probabilities of occurrence than major rupture, and smaller leaks (less than 3 BPH) may go undetected by the SCADA system for days or weeks until the leak is detected by visual observation at the surface. For these reasons, smaller leaks pose a more probable threat of significant impact to groundwater than major spills or ruptures.

Large spills, ruptures, or detectable leaks are less probable in terms of potential groundwater contamination because in these instances the pipeline valves would be closed immediately and the defect repaired. Because of the viscous nature of crude oil, nearly all of the spilled product could be cleaned up by removal of visibly contaminated soil near the surface. If cleanup efforts were prompt, very little oil would have an opportunity to seep to the water table.

Movement of oil through soils and aquifer systems would depend upon viscosity of the oil, soil and aquifer permeability, and depth and hydraulic gradient of the water table. Since the typical Santa Barbara crude oil is over 1,500 times more viscous than water at 68° F, the rate of oil movement through soils and aquifers would be proportionally slower than that of water. Where the depth to the groundwater table is great, oil may be immobilized by processes of absorption and adsorption before reaching the water table.

In most sedimentary deposits, materials of variable permeability are deposited in horizontal layers or bedding. The effects of bedding upon the vertical seepage of oil through unsaturated soils are important because permeability can be much greater in the horizontal direction than vertically. This would tend to make the oil spread laterally, thus allowing more oil to be immobilized before the seepage front reached the water table than would occur in a homogeneous, non-layered soil.

If oil from a pipeline rupture, spill, or leak were to reach the water table, then oil would float on top of the water table because of the lower density of the oil and the relative immiscibility of the two fluids. The oil would tend to spread out over the water table surface and flow downgradient in the same direction as the water, but at a much slower rate of flow. Some fractions of the crude oil would be water soluble. These soluble fractions would mix with and move at the same rate as groundwater until they became immobilized by soil particles, were biochemically degraded, left the groundwater regime as volatile gases, or were discharged with contaminated water to wells or springs.

Because of the slow movement of crude oil through soil and aquifer materials, the effects of groundwater contamination can be long term in comparison to oil spills in surface waters. Cleanup of contaminated groundwaters is expensive, time consuming, and sometimes uncertain because of complex geologic conditions. Oil immobilized by soil absorption may be remobilized by percolating recharge water or seasonally rising groundwater tables. Remobilization could occur by processes of displacement of oil from soil pore spaces and dissolution of the soluble fraction of the crude oil.

In addition to water quality problems associated with oil contamination of groundwater, hazards of fire and explosion are also possible. Occurrence of these impacts would be less probable than leaks or spills. This impact would be limited to developed areas where explosive gases or liquids could accumulate in wells, basements, or excavations. For explosive gases to accumulate, a confining layer of impervious soil or pavement must overlie the body of escaped crude oil.

Abandonment. Upon abandonment, oil would be removed from the pipeline by displacement with water. The water would then be treated to remove oil and to meet applicable discharge regulations. If reasonable precautions were used, abandonment would have negligible impacts on groundwater.

4.2.5.2 Las Flores to Emidio. In the event of an oil spill or leak, groundwater quality could be significantly degraded in one of four sensitive groundwater basins along this segment of the applicants' proposed pipeline alignment. These sensitive basins include the Santa Ynez, San Antonio, Sisquoc River, and Cuyama Valley groundwater basins. These basins have minimum depths to water of less than 10 ft locally and have high to moderate degrees of groundwater development. Most significant is the Santa Ynez River Valley because of the proximity of numerous domestic and public water supplies to the pipeline crossing.

The applicants' alignments differ slightly as proposed by Getty and Celeron/All American. The Getty alignment crosses the Santa Ynez River upstream from Buellton and proceeds north along Zaca Creek. This alignment would impact a greater number of wells in the event of an oil spill or leak than Celeron's crossing downstream from Buellton. Additionally, the Getty alignment would add approximately 3 miles to the length of pipeline through the San Antonio Creek Basin. This would mean a total of 7 miles for Getty's and 4 miles for Celeron's alignment through this sensitive groundwater basin.

4.2.5.3 Emidio to Blythe. Most of this pipeline segment would not be significantly affected by the Celeron/All American proposal. One sensitive area exists on the Mojave River groundwater basin at Barstow. Shallow depths to groundwater and a high degree of groundwater use for municipal, irrigation, and industrial supplies indicate that oil leaks or spills would be significant in terms of water quality degradation in this area.

4.2.5.4 Blythe to McCamey. Significant groundwater quality degradation could occur in the event of pipeline leaks or spills in ten sensitive groundwater basins that are crossed by the proposed pipeline in this segment. The crossing of Rio Grande Valley is probably the most sensitive of these areas because of the shallow water table and high degree of use for municipal and irrigation supplies. Other sensitive basins include Centennial, LaPosa, Lower Santa Cruz, San Pedro, Sulfur Springs Valley, San Simon, Animas/ Lordsburg Valleys, Mimbres Valley, and Pecos River Valley.

4.2.5.5 Summary of Groundwater Impacts. Significant groundwater impacts could occur primarily during operation of the pipeline. Impacts would include groundwater contamination by introduction of crude oil which would occur only in the event of pipeline leaks, ruptures, or spills. Although the probability of these events is low (see Section 4.2.15), their occurrence may be significant in terms of groundwater impacts. The greatest potential for groundwater problems is associated with small undetected leaks in the pipeline. This is due to the larger probability of occurrence, relatively small amount of oil needed to contaminate a water supply, the long lasting effects of such a leak, and the difficulty of aquifer decontamination. Major spills, ruptures, and detectable leaks could probably be cleaned up before significant groundwater contamination results and have lower probabilities of occurrence than smaller leaks.

4.2.6 Aquatic Biology

Impacts to aquatic resources were classified as significant or insignificant based on scientific criteria. The criteria were derived from regulatory standards, research information, and standards based on best professional judgement of resource specialists. Impacts were considered significant if:

- Critical habitat for important fish species of recreational and/or threatened and endangered status is affected by increased sedimentation or removal during construction on a long-term basis (greater than one year or one life cycle);
- A major oil spill affects a large portion of important spawning or rearing areas of important fish (game fish, threatened or endangered species, or native non-game fish);
- A major oil spill is toxic to a large portion of important permanent resident fish populations (temporary residents could be replaced during future high water periods);
- A major oil spill occurs in a small stream or backwater areas of a larger stream.

Impacts to fish and other aquatic communities from construction and operation of the pipeline at stream crossings would vary depending upon the time of year, physical characteristics of the stream (e.g. substrate, flow, channel configuration), and type of fishery present. The following discussion describes the general nature of the impacts that would result from the construction and operation phases of the project. Specific significant impacts then are described for particular stream crossings in each pipeline segment.

4.2.6.1 Potential Impacts to Aquatic Resources

Construction. The types and magnitudes of impacts resulting from construction would be similar for the Celeron/All American and Getty proposals. Primary impacts on the aquatic environment resulting from construction activities during low flow in the summer include substrate removal, increased sedimentation, and habitat alteration. The effects of these primary impacts on aquatic biota include: reductions in plant (algae and macrophytes) and benthic macroinvertebrate abundance, and displacement and possible reduction in resident fish populations (Reed 1977; Robinson 1979; Murphy et al. 1981). Reductions in the fish population would result if important spawning or juvenile rearing areas were covered by increased sediment or removed from the stream. The impacts would be short term in duration, generally less than one year or one life cycle for fish and several months for other aquatic communities. Sediments deposited downstream from the crossing site would be resuspended, along with naturally occurring sediment, during the next period of high discharge (usually in the winter). The removal of riparian vegetation would not significantly affect permanent fish populations, since it is not the dominant cover type along any stream. In summary, no significant impacts would occur in streams as a result of increased sedimentation and minor habitat alteration.

A possible concern during construction would be a fuel or lubricant spill in the vicinity of a stream. However, the volume of fuel spilled should be relatively small (less than 40 gallons) which reduces the risk to aquatic organisms. If a spill does reach a stream containing important fish species (Table 4-6), significant impacts could occur due to direct toxicity or damage to important habitat. The extent of damage and duration would depend upon the volume of fuel or lubricant reaching the stream, physical characteristics of the stream, sensitivity of organisms present, and time of year. The effects of a fuel or lubricant spill on aquatic communities would be generally similar to operational spills and therefore, these are addressed in the operation section. In general, the types and magnitude of impacts would be similar for the Celeron/All American and Getty proposals on the Las Flores to Emidio segment. The only notable difference is that the Celeron/All American proposal crosses and could represent potential significant impacts to important fish species in Refugio Creek.

Other potential construction impacts evaluated but considered to be insignificant include the effects of altered flows resulting from hydrostatic testing and increases in fishing pressure. Because water for hydrostatic testing would be obtained from the California Aqueduct, the potential loss of fish habitat (mostly adult) in this concrete-lined channel is considered to be insignificant. Similarly, any increase in fishing during construction, either legal or illegal, would be confined to several weeks and thus, it would not remove a significant quantity of game fish.

Operation. The major concern during the operation of the pipeline would be an oil spill near or at stream crossings. Although the probability of occurrence (0.04-0.2 spills/year), use of automatic block valves and check valves, and oil contingency plans (see Section 4.2.14) indicate a low oil spill risk; if a spill occurred, impacts could be significant. The level of impact to aquatic resources in terms of duration and length of stream reach affected would depend upon the size of the spill, time of year, physical characteristics of the stream (e.g., bottom substrate, flow, channel configuration), cleanup and control techniques, and susceptibility of the dominant or important aquatic organisms to oil. Spills in small streams would likely be more persistent in their negative effects. After the oil has degraded, aquatic communities would be able to return to prespill conditions by recolonization from unaffected areas. The recovery period is usually several months for benthic macroinvertebrates and several months to two years for fish (Cheremisinoff and Morresi 1977). Studies on a crude oil spill in the North Platte River near Glenrock, Wyoming showed that benthic macroinvertebrates were almost totally destroyed but no fish mortalities were observed (EPA 1982b). However, fish flesh did exhibit disagreeable odor and taste for about two months after the spill. Oil concentrations on the river surface ranged from 2.8 to 8,195 milligrams per liter (mg/l) immediately after the spill but were below 10 mg/l after 7 days. Dissolved and emulsified oil in the water column never exceeded 10 mg/l. The study also showed that benthic macroinvertebrate communities recovered at most sites after two months.

TABLE 4-6

STREAMS WHERE A MAJOR OIL SPILL COULD MEASURABLY AFFECT IMPORTANT[1] PERMANENT RESIDENT FISH POPULATIONS

Pipeline Segment (Stream/State)	Species Potentially Affected	Map Code[2]	Sheet Number[2]
<u>Las Flores to Emidio</u>			
Refugio Creek/CA	Rainbow trout Threespine stickleback	A1	2
Gaviota Creek/CA	Rainbow trout Prickly sculpin Tidewater goby*	A2	2
<u>Emidio to Blythe</u>			
Colorado River/CA & AZ	Black crappie Bluegill Channel catfish Green sunfish Flathead catfish Largemouth bass Razorback sucker* Redear sunfish Striped bass White crappie Yellow bullhead	A3	6
<u>Blythe to McCamey</u>			
Gila River/AZ	Bluegill Channel catfish Largemouth bass	A4	7
Hot Springs Canyon and Bass Canyon Creeks, Muleshoe Ranch Preserve/AZ	Gila chub* Longfin dace Speckled dace Desert sucker Sonora sucker	A5	8
Rio Grande River/NM	Bluegill Channel catfish Flathead catfish Largemouth bass Mexican tetra* Rainbow trout	A6	10

TABLE 4-6

Pipeline Segment (Stream/State)	Species Potentially Affected	Map Code[2]	Sheet Number[2]
Pecos River/TX	Bluegill Channel catfish Fathead catfish Largemouth bass White bass	A7	11

Source: ERT

[1]Important species defined as game fish, threatened or endangered*, or native non-game fish (Refugio, Gaviota, Bass Canyon, and Hot Springs Canyon Creeks only)

[2]Map code and sheet number in Map 1-2.

Toxicity studies using water-soluble fractions in crude oil have shown that salmonids, striped bass, and slimy sculpin are quite sensitive, while channel catfish and bluegill appear to be tolerant (Table 4-7). Although these studies only deal with some of the species occurring in the study area, they still help to identify sensitive species or families of fish.

4.2.6.2 Las Flores to Emidio. Significant impacts would occur during the operation of the pipeline as a result of a major oil spill or leak. The only notable difference in potential impacts in the event of an oil spill would be exhibited in Celeron's proposed segment between Las Flores and San Onofre Creeks. Both Getty's and Celeron's proposals would cross Gaviota Creek, while only the Celeron proposal would cross the other coastal streams. Considering the significance criteria, important permanent resident fish populations could be measurably affected in Refugio and Gaviota Creeks. Fish species that could be affected are listed in Table 4-6. Fish populations should recover within several months to about two years, depending upon the extent of damage to eggs and juveniles. The only exception would be the possible total loss of the tidewater goby population if the oil spill occurred in toxic concentrations in the winter when only about 100 fish were present.

A major oil spill into any of the coastal streams between Las Flores Canyon and Gaviota also could measurably affect nearshore marine communities. Benthic macroinvertebrates, surface-feeding fish, and shorebirds would be the most sensitive species in nearshore marine areas (Cheremisinoff and Morresi 1977).

Pipeline construction would cause temporary increased sedimentation and minor habitat alteration in all streams. As a result of these changes, there would be temporary reductions in plant and macroinvertebrate abundance in all streams, and possible displacement or reduction in fish numbers in Refugio, Tajiguas, and Gaviota Creeks. These impacts would be considered insignificant because of their short-term duration of several months. No unique or critical tidewater goby habitat would be altered during construction Appendix B, Table B-2. In addition, since steelhead and rainbow trout spawning would occur in the winter and spring, respectively, increased sedimentation in the summer would not impact these species.

4.2.6.3 Emidio to Blythe. As a result of a major oil spill, important fish populations would be significantly affected in the Colorado River (Table 4-6). Considering the available information on oil toxicity to fish (Table 4-7), striped bass could be the most susceptible species. Considering the large volume of water in the Colorado River, impacts would only be critical in the backwater areas located about 0.25 mile below the proposed crossing.

Construction-related impacts would be similar to those described above. No unique or critical razorback sucker habitat would be altered during construction (Table B-2).

TABLE 4-7

ACUTE TOXICITIES OF WATER-SOLUBLE COMPOUNDS
IN CRUDE OIL FOR JUVENILE FISH
(in mg/l)

Species	Total Water-Soluble Fractions	Benzene	Naphthalene	Toluene	Literature Source
Cutthroat trout	0.52	NA[1]	NA	NA	Woodward et al. (1981)
Coho salmon, sockeye salmon	0.5	NA	NA	NA	Morrow (1974)
Anadromous salmonids	1.25-1.79	NA	NA	NA	Moles et al. (1979)
Striped bass	2.0-11.0	5.1	NA	6.3	Benville and Korn (1977); EPA (1980 a,c)
Slimy sculpin	3.0	NA	NA	NA	Moles et al. (1979)
Threespine stickleback	>6.89	NA	NA	NA	Moles et al. (1979)
Bluegill	No mortality at 1:9 mixture (oil:water)	22.5	NA	12.7, 24.0	EPA (1980 a,c) Mitchell and Bennett (1972)
Channel catfish	No mortality at 1:9 mixture (oil:water)	NA	NA	NA	Mitchell and Bennett (1972)
Rainbow trout	NA	5.3	2.3	NA	EPA (1980 a,b)
Mosquitofish	NA	386.0	150.0	NA	EPA (1980 a,b)

[1]NA = Data not available.

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4.2.6.4 Blythe to McCamey. A major oil spill would significantly affect important resident fish populations in the Colorado, Gila, Rio Grande, and Pecos Rivers, and Bass Canyon and Hot Springs Canyon Creeks in the Muleshoe Ranch Preserve (Table 4-6). Fish populations would recover within several months to about two years in all streams except those in the Muleshoe Ranch Preserve. If the oil spill affected a major portion of the Gila chub population in these streams, the recovery time could be longer than two years.

Construction impacts would be similar to those described above. No unique or critical Mexican tetra or Gila chub habitat would be altered during construction (Table B-2).

4.2.6.5 Summary. As a result of pipeline construction, aquatic biota would be exposed to temporary increased sedimentation and habitat alteration. Adverse impacts associated with these changes would include reductions in plant and macroinvertebrate abundance, and displacement or reductions in resident fish populations. These impacts would be considered insignificant because of their short-term duration of less than one year. Potential significant impacts to aquatic organisms could occur during construction as a result of fuel or lubricant spills.

Although the oil spill risk is low, significant adverse impacts to aquatic resources could occur during operation of the pipelines as a result of a major oil spill or leak. The level of impact to aquatic communities would depend upon the size of the spill, time of year, physical characteristics of the stream, cleanup and control techniques, and susceptibility of dominant or important aquatic organisms to oil. Sensitive streams would be those that contain fish considered to be important game fish, threatened or endangered, or native species in coastal streams or the Muleshoe Ranch Preserve. Except for streams containing threatened or endangered fish species, populations would recover within several months. Nearshore marine communities also could be adversely affected by a major spill into any of the coastal streams between Las Flores Canyon and Gaviota Creek, California. Freshwater communities that could be significantly affected are the Colorado, Gila, Rio Grande, and Pecos Rivers, and streams in the Muleshoe Ranch Preserve.

In conclusion, the types and magnitude of impacts resulting from construction related or operational spills would be similar for the Celeron/All American and Getty proposals. The only notable difference is that the Celeron/All American proposal segment could represent potential significant impacts to aquatic resources in Refugio Creek and nearshore marine communities between Las Flores and San Onofre Creeks in the event of a major oil spill.

4.2.7 Terrestrial Biology

The impacts discussed for terrestrial biology are classified as significant or not significant based on the degree of impact as measured against scientific and social (or human) criteria. The criteria that follow are derived from regulatory standards, research information, and/or standards based on best professional judgement of resource specialists.

- Loss of vegetation productivity resulting from removal of cover and surface disturbance would be considered significant if: 1) following construction specifications revegetated areas would not have adequate ground cover to control soil erosion at preconstruction levels, and 2) would not have adequate cover of species which have a utility in the post-disturbance land use. In other words, species making up the revegetated area can not be dominated by noxious weeds and the area must be able to support future land uses such as grazing, agricultural development, or wildlife habitat.

- Loss of riparian zone vegetation, live oaks, rare cactus, wetlands, or other communities or plant species considered to be rare, unique, or sensitive by Federal, state, or local agencies would be considered significant. (This is consistent with Executive Order 11990, Protection of Wetlands, May 24, 1977).

- Impacts to vegetation resulting from operational emissions would be considered significant if emissions exceed injury thresholds (i.e. cause visible injury) for sensitive vegetation (Argonne National Laboratory 1980).

- Impacts to sensitive wildlife would be considered significant if critical ranges or habitats (e.g., wintering areas, lambing grounds, migratory routes, dens, breeding grounds, nests) are affected during the season of use.

- Impacts to federally listed threatened or endangered species would be considered significant if the Biological Assessment required under Section 7 of the Endangered Species Act determines that a species is in a "may affect" category. The BLM is currently preparing a Biological Assessment, potential "may affect" relationships are discussed in the DEIS. Fish and Wildlife's Biological Opinion will be included in the FEIS.

4.2.7.1 Potential Impact to Terrestrial Resources

Construction. The construction procedures include the use of up to a 100-ft wide ROW for Celeron/All American and a 50-ft wide ROW for Getty used for trenching, stock-piling backfill, pipe assembly, and equipment movement. Some plants would be completely removed by trenching, clearing, and crushing and others may be damaged but survive. Construction of the pipeline would result in the direct removal of plants and death or displacement of animals in the ROW. Small mammals, amphibians, and some reptiles with limited mobility would be killed by habitat clearing, earth removal, digging, and equipment movement. Local populations (in the ROW) would decrease for the short term. Animals should re-invade the area following reclamation and natural revegetation processes. Since most of these species have high reproductive potential and are common in surrounding habitats, loss of individual plants and animals would generally not be considered a significant impact, except in the Mojave Desert where natural revegetation could take up to 70 years and where federally listed endangered species were affected. Where construction would affect threatened, endangered, or sensitive species, impacts would be considered significant.

Larger mammals, birds, and some reptiles would be able to avoid the construction area, impacts to these animals are expected to be minimal. Noise and general human disturbance would preclude most larger animals from the construction area for the duration of construction. The cleared ROW may temporarily provide a barrier to normal movement patterns and "fragment" habitat in previously undisturbed areas. Displacement of animals is generally not considered a significant impact; however, impacts would be significant if construction displaced animals in critical habitats or at a critical time of the year (bighorn sheep lambing areas or in the nesting season).

Increased use of vehicles and the presence of man in previously remote areas would increase the risk of wildlife harassment, illegal hunting, and removal of sensitive or commercially valuable plant species like cactus.

Operation. Oil spills could kill vegetation and result in erosion and loss of wildlife habitat. Spills over 50 acres would be unlikely; the worst-case spill on the Celeron/All American or Getty route would release about 15,000 barrels and cover about 16 acres (see Soil 4.2.3.1 Operation Impacts). Impacts to vegetation or wildlife could be significant or insignificant on a regional basis depending upon the size, time, and location of a spill. Impacts could be significant if the oil contaminated a rare plant or animal species or its habitat. Spills would be more serious in wooded areas, on steep slopes, or in wetlands because cleanup would be difficult, regeneration time would be longer than for other areas, and high value wildlife habitat could be affected, especially wetlands.

Terrestrial plant communities could be directly and indirectly affected by oil spills. Oil in the soil can reduce the availability of water to plants and cause plant mortality due to direct oil contact (Hutchinson et al. 1974). Direct contact of oil with the plants can cause loss of foliage, reduced photosynthesis, reduced nutrient levels, reduced flower and seed production, and toxic effects on cells (Hutchinson et al. 1974). In areas where plants have been killed by oil at a dosage of 0.1 to 0.9 gallons per square yard, two to three years may be required before plant life can become re-established (Schwendinger 1968). Indirect impacts can result from clean-up efforts such as burning, clearing of oiled vegetation, or removal of topsoil. Plant regeneration is best on well drained soils. Impacts to trees and shrubs can be less severe if root systems are oil-free and well aerated. Impacts of oil when deciduous plants are in leaf are generally more severe than when they are dormant.

Direct impacts to terrestrial wildlife (e.g., land mammals, birds) would be minimal because of the small size of the affected area and the mobility of these species. Indirect impacts to habitat could be more serious, although not usually significant on a regional basis. Information on effects of oil on soils and vegetation is well documented in temperate climes; however little information is available on the direct impacts of spills on wildlife, especially in desert climes. The timing (season), species of wildlife involved, and volume of the spill would determine the magnitude of the impacts to terrestrial resources; spills in waterways are generally more severe than spills on land. No discussion of oil spill effects on terrestrial ecosystems in desert climes have been reported in recent literature based on a computer data base literature search conducted in June 1984. In general, spills in freshwater systems pose greater threats to terrestrial wildlife than on land spills. Two examples of large spills in freshwater systems are documented for Sagavanirktok River and the North Platte River. At Prudhoe Bay, a 2,000-barrel oil spill occurred in and along the Sagavanirktok River, killing some vegetation and oiling some birds and foxes. No dead wildlife was found and new vegetation along the river began to grow in 10 days (Anderson 1983). However, a 8,552-gallon oil spill on the North Platte River in Wyoming caused the death of 335 birds (mainly waterfowl) and 33 mammals (primarily beaver and muskrat) (EPA 1983).

Waterbirds (e.g., marshbirds, waterfowl) and aquatic mammals such as muskrat and beaver can be directly affected by an oil spill through 1) physical contact with oil, 2) ingestion of oil, or 3) through loss of food or habitat. Birds with oiled plumage can get so waterlogged they cannot fly and may drown (Nelson-Smith 1972). Oiled aquatic mammals can lose water-shedding qualities in their fur, resulting in death from exposure. Waterfowl can ingest oil through preening, resulting in loss of appetite, sickness, and death from a combination of starvation and exposure (Hartung 1967). Poor hatching success may also result when eggs are incubated by oiled birds (Hartung 1965). If a food source or essential habitat is impacted by oil, waterbirds may die or become weak attempting to find alternate food or habitat (Nelson-Smith 1972).

Operation of the pipeline, primarily because of increased ORV access, would increase the risk of wildlife harassment, illegal hunting, and removal of commercial plant species (cactus) in remote areas. Operational maintenance may slightly increase the risk of fire in desert grasslands and chaparral, but would also aid in fire suppression in chaparral and wooded areas where the ROW could function as a fuel break and allow access to remote areas for fire prevention. No adverse impacts to vegetation and wildlife are expected from air emissions from construction equipment, dust, pump stations and tank farms.

Abandonment. Several options are possible for pipeline abandonment (see Chapter 2). The option resulting in the most impact to vegetation and wildlife would be the removal or salvage of pipe. For this option, pipe would be removed at all locations except stream crossings and major pipe bends. The expected impacts from abandonment would be similar to construction impacts but generally less severe. Digging up the buried pipe would disturb revegetated ground cover on the ROW. The ground cover would most likely be comprised of grass and/or shrub species. Given the small area removed by trenching to remove pipe, loss of vegetative productivity would be minimal. Some loss of small mammals may result from clearing, and larger animals would be displaced and disturbed by increased human activity on the ROW. These impacts are not considered to be significant.

4.2.7.2 Las Flores to Emidio. This segment covers 122 miles along the Celeron/All American proposed route and 113 miles along the Getty proposed route. Both ROWs follow the same route except across the LPNF (Map 1-2). Getty's proposed ROW across the forest would be 50 ft, while Celeron/All American's would be 100 ft wide. Construction along both routes would impact primarily grasslands and desert scrubland. Both pipeline routes would remove small areas of riparian woodlands (0.5 acre) at coastal stream crossings. The Getty route would affect about 34 acres of riparian woodlands and the Celeron/All American route would affect about 62 acres, with most of the disturbance occurring in La Brea Canyon. This is because the Celeron/All American route would follow a chaparral ridge top across the Forest, while Getty's route would follow the stream course. Construction in stream bottoms would remove live oak trees estimated to be 100 or more years old (G. Smith 1984, personal communication). Live oak are protected in Santa Barbara County and limiting the number of individual trees affected would be necessary. Loss of mature riparian woodlands in La Brea Canyon is considered a significant impact. Table 4-8 summarizes significantly impacted resources along the proposed routes.

Both routes would affect oak woodland communities (Table 3-18). Oak woodlands removed by construction could take up to 70 years to regenerate, assuming natural conditions encourage seedling survival (Smith G. 1984, personal communication). In this area, where grazing is common, seedlings may never become established without special protection, and oak woodlands would likely be replaced by grasslands. Loss of about 138 and 88 acres of oak woodlands would be a long-term impact of the Celeron/All American and Getty proposals.

Pump station construction at Las Flores, Gaviota, and Sisquoc would remove eight acres of grassland, this would not be a significant impact. Construction of Getty's Cuyama pump station would remove about another 5 acres of grassland. This area is not considered to be potential habitat for the San Joaquin kit fox, San Joaquin antelope squirrel, giant kangaroo rat, and the blunt-nosed leopard lizard (Lidburg 1984, personal communication).

Construction of a new 12-mile (Celeron) or 13.5-mile (Getty) 115-kV line to the Sisquoc pump stations would permanently remove about 1.0 acre of grassland, chaparral and agricultural land (vineyards). Oak woodlands and riparian woodlands would not be affected. Construction disturbance would be minimized by using existing roads and the pipeline ROW for constructing the transmission line.

Three plant species (Hoffman's nightshade, Refugio manzanita, and Catalina mariposa), considered to be rare in California (Table 4-8), were found in the Gaviota Pass area along or near Getty's proposed route (WESTEC 1983). Hoffman's nightshade has colonized disturbed habitat along the existing gas line, and according to California Native Plant Society (1980) it is rare, but not in danger of extinction. The Catalina mariposa is also not endangered and is increasing or stable in California (WESTEC 1983). The Refugio manzanita is listed as rare and endangered and is only found in Santa Barbara County in Gaviota and Refugio Pass. Loss of these individuals along Getty's proposed route would be a significant impact.

TABLE 4-8

VEGETATION, WILDLIFE, OR SENSITIVE PLANT COMMUNITIES SIGNIFICANTLY AFFECTED BY CONSTRUCTION AND OPERATION OF THE PROPOSED PIPELINES

Map Code	Sensitive Resource	Location	Status/Description
T1	Refugio manzanita	Gaviota and Refugio Pass - Santa Barbara Co., CA	CNPS[2] Rare and endangered, species of concern; undisturbed chapparral 400-600 feet elevation
T2	Live oak, riparian vegetation	La Brea & Tepusquet Canyons, CA	Protected by Santa Barbara Co. ordinance; floodplain woodlands
T3	Giant kangaroo rat	Cuyama Valley, CA	CA Fish & Game, endangered; alkali scrubland
T4	Blunt-nosed leopard lizard	Cuyama Valley, CA	Federally listed endangered species; CA Dept. Fish & Game, endangered; alkali scrubland, sinks, sandy loam soils
T5	San Joaquin antelope squirrel	Cuyama Valley, CA	CA Fish & Game, rare; dry, sparsely vegetated, loamy soils
T-6	Comanche layia	Tejon Hills, Kern Co., CA	Federal candidate species, CNPS species of concern; moist benches, valley grasslands
T-7	Calico monkey flower	Tejon Ranch, Kern Co., CA	CNPS species of concern; granite rock outcrops
T8	Joshua tree woodland	Double Mtn., east to Kramer, CA	Protected by Kern Co.; desert slopes and mesas
T-9 T-13	Desert tortoise Desert tortoise	Mojave Desert (Barstow to Blythe), CA and Kofa National	Federal candidate species; BLM sensitive species;

TABLE 4-8 (CONTINUED)

Map Code	Sensitive Resource	Location	Status/Description
T-14	Desert tortoise	Wildlife Refuge	AZ, Group 3; desert and semi-desert grassland
T-10 T-11	Barstow woolly sunflower Barstow woolly sunflower	Barstow Area near Iron Mtn., and East of Barstow, Kern Co., CA	Federal candidate species, CNPS species of concern; sandy and rocky places
T-12	Crucifixion thorn	Southern Mojave Desert, Kern Co., CA	CNPS species of concern; dry gravelly places
T-15	Desert dune communities	Rice Valley, South of Highway 62 near Rice, Riverside Co., CA	BLM sensitive community
T-16	Ironwood washes	Rice to Blythe, Riverside Co., CA	BLM sensitive community
T-17	Desert bighorn sheep	Dome Rock Mts., Kofa National Wildlife Refuge, AZ	Forest Service & BLM, Sensitive; AZ, Group 3; desert mountains
T-18	Muleshoe Ranch Nature Preserve (black hawk, gray hawk, zone-tailed hawk, northern beardless tyrannulet)	Hooker Hot Springs area, south of Coronado Forest, Cochise Co., AZ	AZ Nature Conservancy Nature Preserve, managed primarily for unique vegetation, birds and fish. AZ, Groups 2 and 3; black hawk, gray hawk, zone-tailed hawk, northern beardless tyrannulet
T-19	Gypsum Dunes Nature Preserve	Near Salt Flats, TX south of Guadalupe National Park	TX Nature Conservancy Nature Preserve; unique dune community

Source: ERT

[1]Corresponds to number listed on Map 1-2

[2]California Native Plant Society

A worst-case oil spill along this segment of pipeline would affect 16 acres for the Celeron or the Getty proposal. This assumes a worst-case spill of 15,000 barrels and the spill occurred on level terrain. A spill at a perennial stream crossing could affect several acres of riparian vegetation in perennial streams like the Cuyama, Santa Ynez, or Sisquoc Rivers and La Brea Creek. A spill in any perennial stream is considered a significant impact.

If an oil spill occurred in a perennial coastal stream (see Section 3.2.6.1 for a description of coastal streams) it could possibly reach the coast, oiling the beach and off shore marine habitats (see Section 4.2.6.2).

Riparian vegetation, especially along Cañada del Refugio, Arroyo Hondo, Zaca Creek, and Cañada de las Alisos could also be affected by a spill. Impacts would vary depending on the location, season, and volume of oil spilled. Oiled trees and large shrubs would likely survive oiling, while herbaceous vegetation would not. The risk of an oil spill (0.04-0.2 spills/year) is very low.

Construction would temporarily disturb and remove 2,242 acres of wildlife habitat. Vehicle use off the ROW could also result in the loss or damage to sensitive plant communities and wildlife habitat adjacent or near the ROW. Increased human presence could disturb larger wildlife and change normal movement patterns. Increased access into previously undisturbed areas could result in increased illegal hunting of big game, and other violations of wildlife laws. The open trench along La Brea Creek could prevent wildlife (especially big game) from reaching water. Given the short-term nature of construction these impacts are considered to be temporary, small in magnitude, and not significant along this pipeline segment.

Raptors nesting near or on the pipeline ROW could abandon nests if construction occurred during the nesting season. This would result in nest failures, and lowered population numbers for at least one season, a significant impact.

The Celeron/All American and Getty proposals would impact sensitive wildlife habitat in the Cuyama Valley (Map 1-2). Three federally listed endangered species (blunt-nosed leopard lizard, San Joaquin kit fox, and California condor) and two state-listed species (San Joaquin antelope squirrel and giant kangaroo rat) have been observed or are known to occur in the Cuyama Valley (WESTEC 1983).

The blunt-nosed leopard lizard, San Joaquin antelope squirrel, and giant kangaroo rat, which are less mobile than larger animals and are burrowing species, would be affected in the ROW by pipeline construction in alkali scrubland. About 26 miles of alkali scrubland occur along the pipeline routes in Kern and San Luis Obispo County. Insufficient data are available to evaluate the number of individual lizards, squirrels, and kangaroo rats potentially lost during construction. These species would be expected to reinvade the area if natural vegetation becomes reestablished. An oil spill in this habitat would kill an unknown number of individuals (as much as 16 acres of habitat could be affected). Individual losses of these species would be a significant impact.

The San Joaquin kit fox has been reported along Highway 166 and also occurs in alkali scrubland habitat along both pipeline routes. Kit fox would be temporarily displaced during pipeline construction activities. If an occupied natal den was disturbed by trenching or affected by an oil spill, loss of pups and reduced population numbers would result, a significant impact. However, given the small area affected by pipeline construction or the area potentially affected by an oil spill, and general lack of fox sign along the pipeline, the risk of impacting kit fox or a kit fox den is considered to be minimal.

Pipeline construction and operation is not expected to significantly impact condors. If condors are present during construction, impacts would be short-term and temporary. Condors may be temporarily displaced to avoid disturbance, but no critical habitats (e.g., roost sites) would be affected. It is not known how much human or ground disturbance condors will tolerate in their foraging areas before moving to other areas. Since the pipeline would not affect land use patterns, especially sheep grazing activities, it is considered unlikely that condors would avoid the essential habitat areas crossed by the pipeline. Likewise, an oil spill would probably not permanently affect foraging condors. The pipeline would cross, but would not significantly impact portions of the San Joaquin Valley in areas that may be purchased for management as condor habitat.

4.2.7.3 Emidio to Blythe. This route segment is 294 miles long; most of the route follows existing corridors. Construction would remove desert scrubland comprised of creosote-bursage communities. The pump station at Tejon would require removal of 5.5 acres of desert grassland. The Twelve-Gauge Lake pump station and the tank storage facilities at Cadiz would remove another 25.5 acres of desert scrubland for the life of the project. Construction of a new 20-mile 70-kV or 115-kV power line to the Tejon pump station would remove an additional 2.4 acres of agricultural land and 0.8 acres of grassland for the life of the project. This loss of grasslands would not significantly affect wildlife. The potential for raptor electrocution is considered to be minimal since 115-kV lines have adequate conductor spacing to protect raptors (Olendorff et al. 1981). If a new 70-kV line was constructed, it would conform to recent raptor protection guidelines.

Construction of the new powerline and gas line to the Cadiz tank farm would disturb about 90 acres of desert scrubland. The 20-ft construction and access trail along the powerline would not revegetate for several years. Therefore, this loss of 90 acres would be a long-term loss of vegetative productivity. Desert tortoise could be killed by clearing of the ROW or injured by construction equipment working on the ROW. Any losses of individual tortoise is considered a significant impact. Desert bighorn would not be significantly affected by construction or operation since they occur at higher elevations away from the proposed routes.

No significant impacts would result from construction or operation of power lines in New Mexico and Texas.

The route crosses 213 miles of desert scrubland including 2.7 miles of alkali sink across Danby Lake. No revegetation is planned for the Mojave Desert, reestablishment of natural vegetation and wildlife habitat would rely on natural reinvasion and regeneration. Studies of pipelines and other corridor developments in the Mojave Desert indicate natural revegetation may take up to 70 years (Lathrop and Archbold 1980). Loss of about 2,580 acres of desert scrubland communities would be a long-term unavoidable impact of the Celeron/All American proposal. Since disturbed areas would not have cover or a utility in the post-disturbance land use, this would also be a significant impact.

Joshua tree woodlands occur along the pipeline and are protected in Kern County. Some individual Joshua trees would be removed by grading and trenching equipment. Losses would be minimized since the proposed route follows an existing pipeline and highway in this segment. Construction in stabilized dune communities could cause increased erosion and changes in dune movement patterns, resulting in lost habitat for specialized small desert mammals and reptiles. Maintenance traffic and recreational ORV use would also increase habitat destruction and erosion in these sensitive communities. Construction across ironwood washes would remove 100-ft sections of these communities along the edges of the washes. Loss of these sensitive plant communities (Joshua trees, dunes, and ironwood washes) would be considered a significant impact.

Individuals of four species of sensitive plants would be removed by pipeline construction (Table 4-8). Two of these species, the Comanche layia and Barstow woolly sunflower, are candidates for Federal listing. The Calico monkey flower and crucifixion thorn are species of state concern. Inadequate data are available to confirm the presence of other rare species on the ROW. Loss of individual sensitive or rare species would be a significant impact.

Desert tortoise would be vulnerable to disturbance when they are underground during their winter hibernation period between October and March, during daily estivation periods, and during surface movements in the spring (Berry 1984, personal communication). Surface movements usually begin in late March or early April. Hibernating or estivating tortoises could be crushed by the trenchers, buried by back-filling equipment, or die from injuries or exposure to predators. Active tortoise could also be killed by falling in the open pipeline trench, or being crushed by equipment clearing vegetation or moving pipe. Using an average density of 50 tortoises per square mile across 250 miles of 100-ft ROW, about 230 tortoises could be killed.

During operation of the pipeline an oil spill could also kill tortoise in their burrows, although the estimated area affected would only be 16 acres. Assuming an average density of 50 tortoises per square mile, 1 tortoise would be affected by an oil spill. Increased access, poaching, and ORV use could also impact tortoise. Loss of individual tortoises would be significant because of their low reproductive rates and time needed to reach maturity.

The Tehachapi slender salamander and red-legged frog have been reported in the Tehachapi Mountains and could be affected by pipeline construction or operational oil spills. These two species are reported to occur on a private ranch; access on this private land was not possible and site specific verification of these species or their habitats along the pipeline ROW was not completed.

The Mojave ground squirrel occurs in desert scrubland habitats. Given the small area of habitat affected relative to the squirrels distribution and its ability to reproduce, impacts should be short term with no changes in local or regional populations.

The pipeline route passes near desert bighorn sheep habitat near Cadiz, but construction is not expected to affect sheep since the route follows the desert valley floor below elevations used by bighorn sheep. Golden eagle nest near the Killbeck Hills and prairie falcon nests occur on or near the pipeline at Daggett and Newberry Springs (Rado 1984, personnal communication). Construction during the breeding season could cause nest abandonment, resulting in lowered reproductive success for one season. Impacts to nesting birds during the breeding season would be considered significant.

At Blythe, California the pipeline would cross the Colorado River. About 2.4 acres of riparian vegetation and open water habitat would be removed or disturbed during construction. Most of the extensive man-made wetlands are 1,000 to 1,500 ft downstream of the proposed crossing. Loss of riparian wetlands (primarily willows and salt cedar) from construction would be short term, and reinvasion of shrubs would occur within one to three years. Of greater concern is the potential for an oil spill at the Colorado River crossing. A pipeline rupture at the crossing could release about 3,506 barrels of oil (see Oil Spill Potential and Effects, Section 4.2.15). Given the proximity of the downstream wetlands, it is likely this area would be contaminated by oil in the event of an accidental spill. The magnitude of the impact would depend on the volume of oil released, the flow in the river, and the season. At low flow conditions, backwater areas, including most of the wetlands, are separated from the river and would not be oiled. At higher flows the mouth of these areas could be affected as well as several miles of riparian vegetation downstream.

If a spill occurred at the Colorado River during winter, up to 1,200 waterfowl could be affected (Celantano 1984, personal communication). Oiled birds would likely die from exposure, increased stress, or ingestion of oil. If the spill occurred during the breeding season, nesting waterfowl and marsh birds would be adversely affected. Oiled adults and eggs would likely not survive, resulting in reduced population levels.

If a spill was not immediately contained, it is possible oil could reach Cibola and Imperial NWRs, 20 miles downstream of the Colorado River crossing. The Yuma clapper rail (a federally-listed endangered species) occurs in wetlands within these refuges. Loss of individual clapper rail or their habitat would be considered a significant impact.

An oil spill in the Colorado River in any season would be considered a significant impact. However, given the low probability of any spill along the route and the even lower probability of a spill at any given 1,000-ft water crossing (1 spill in 5,000 years), the risk of a spill is very low.

4.2.7.4 Blythe to McCamey. Along this 790-mile pipeline segment, construction would remove primarily desert scrubland, creosote bush scrub, desert cactus scrub, and desert grassland communities. Additional detail on the impacts along this pipeline segment are included in the Sohio EIS (BLM 1976). Construction in these wildlife habitats would temporarily displace large more mobile species and displace or kill small mammals and reptiles, this is not considered a significant impact.

Commercially valuable cactus occur along the route in native Sonoran Desert, especially across LaPaz, Maricopa, Pinal, and Pima Counties (Countryman 1984, personal communication). Cactus would be salvaged where practical, and the loss of commercially valuable species would be minimized.

Construction in Copper Bottom Pass in the Dome Rock Mountains of Arizona during the bighorn sheep lambing season and near existing watering holes in the summer could result in significant impacts. Sheep would be temporarily displaced to other areas and possibly prevented from reaching water, resulting in potentially lowered population numbers.

No lambing areas or watering holes would be directly disturbed by construction in the Kofa NWR, although construction immediately following the lambing season could disrupt movement of ewes and lambs. Recent data from bighorn sheep monitoring studies indicate the Livingston Hills may be important habitat for bighorn sheep using the northern portions of the Refuge (Haderlie 1984, personal communication). Rams move to and from rutting grounds on Black Mesa via the Cave Creek drainage in the Plumosa Mountains during fall; construction could disrupt ram movements. Construction would temporarily remove about 303 acres of wildlife habitat, the two desert bighorn corridors are considered critical wildlife habitat. This area also has relatively high densities of desert tortoise (Burge 1980), and several species of cacti which are protected in Arizona.

Bighorn sheep tolerate disturbance (such as construction workers, noise, and motor vehicles) differently depending on the intensity of their exposure to these activities and their past experience (Graham 1980). It has been demonstrated that bighorn prefer to remain in one home area all year if conditions allow them to, often within a radius of 20 miles of their home water supply. Exhaustion of a water supply is probably the most frequent cause for moving (Welles and Welles 1961). No watering holes occur on or near the route in the Kofa Refuge and construction would not interrupt normal movement patterns across the corridors for water. Normal movement after lambing and during the rut could be altered for up to two weeks. Impacts would be minimal if construction occurred in the summer or winter, when no sheep would be using the migration corridors.

Although much of the riparian zone along the San Pedro River supports dense riparian communities, riparian vegetation is lacking where the pipeline crosses the river. The pipeline would parallel an existing pipeline across the river.

In Cochise County, Arizona near the Hot Springs Pump Station, the pipeline would cross the Muleshoe Ranch Nature Preserve managed by the Arizona Nature Conservancy. The preserve has a unique mixed broadleaf riparian communities in Bass Canyon, Double R Canyon, and Hot Springs Canyon (Weaver 1984, personal communication). These riparian communities are now rare in the Southwestern U.S. and provide nesting habitat for rare species like the black hawk, zone-tailed hawk, gray hawk, and northern beardless tyrannulet (Bill 1984, personal communication). The Celeron/All American proposal would follow the existing El Paso Natural Gas Pipeline through the preserve. Based on the aerial photo alignments, construction would not remove any additional riparian areas within the Muleshoe Preserve. If construction occurred during the breeding season (approximately May through July), human presence may cause nest abandonment, a potentially significant impact. In the event of an oil spill, oil could reach Hot Springs Creek via the many arroyos crossed by the pipeline. An oil spill into the riparian zone along Hot Springs Creek would likely kill herbaceous vegetation and could affect trees if oil reached the root zones. An oil spill in Hot Springs Creek would be a significant impact.

The block valve at Wildcat Canyon Creek and check valves proposed at Wildcat Canyon and Bass Canyon Creeks and at the Hot Springs Pump Station will significantly reduce the volume of oil that would be released in the event of an oil spill.

In New Mexico the pipeline would cross sensitive habitats near Lordsburg and in the Franklin Mountains near Anthony. The Chiricauhua leopard frog, a species of special concern, may occur on the Lordsburg Playa. It is unlikely that pipeline construction would affect this species since the pipeline does not affect any wetland habitats in this area.

Several species of protected plants and animals, including the federally endangered Sneed's pincushion cactus, occur near the pipeline at Anthony Gap in the Franklin Mountains. Several individual cactus populations were known to occur in this area in 1978 (New Mexico Natural Heritage Data Base 1984). Loss of individual cactus from trenching or crushing by construction equipment, or from an oil spill, would be considered a significant impact. Field investigations in May 1984 found hybrid individuals (_C. sneedi_ x _C. strobiliformis_) of the Sneed's pincushion cactus near but not in the ROW at the Anthony Gap area. No individuals would be affected by the current alignment.

Pipeline construction at Gypsum Dunes Preserve would temporarily disturb dunes, removing vegetation and displacing or killing animals. Construction across the dunes may temporarily change dune movement patterns. Given the small area of disturbance and that the proposed ROW would follow an existing pipeline ROW, impacts to vegetation and wildlife would be considered minimal, and not significant. Construction and operation of the pipeline should not significantly alter future management plans or use of the Preserve by the public.

4.2.7.5 Summary. Significant impacts to terrestrial resources would result from both construction and operation of the pipeline. Construction would remove about 200 acres of the following sensitive plant communities; riparian woodlands, live oaks, ironwood washes, and dune communities. About 220 acres of oak woodlands would be removed for the life of the project. About 2,580 acres of desert scrubland in the Mojave Desert would be disturbed; 50 to 80 years would be needed for natural regeneration of vegetation. Individual plants and/or populations of seven sensitive plant species would be affected by construction.

The blunt-nosed leopard lizard and the San Joaquin kit fox, both federally listed endangered species, would be impacted by pipeline construction and accidental oil spills in the Cuyama Valley and southwestern San Joaquin Valley. Five other species of threatened, endangered, or sensitive wildlife would also be affected including, the San Joaquin antelope squirrel, Mojave ground squirrel, giant kangaroo rat, desert tortoise, and desert bighorn sheep. The desert tortoise would be the species most significantly affected by construction.

Operation of the pipeline could result in accidental oil spills in sensitive plant and animal communities; up to 16 acres could be affected by a single spill. An oil spill at the Colorado River could affect large areas of wetlands and several hundred waterfowl and possibly reach wetlands in Cibola and Imperial NWRs 20 miles downstream. Yuma clapper rail (a federally-listed endangered species) could be affected by an oil spill reaching these wetlands.

Construction and operation of the pipeline would affect three important natural area preserves: Kofa NWR managed by FWS (bighorn sheep), Muleshoe Ranch Preserve managed by the Arizona Nature Conservancy in Cooperation with the Forest Service (nesting raptors), and Gypsum Dunes Preserve managed by Texas Nature Conservancy (desert dune communities).

4.2.8 Socioeconomics

Impacts to socioeconomics would be considered significant if they would exceed the following criteria:

- Demand for temporary housing exceeded the existing supply when project-related needs are combined with 5-year average occupancy rates during the scheduled construction season.
- Permanent demand on other infrastructure was greater than 25 percent of the current level of demand; temporary demand exhausted the excess capacity in the areas where the crews would live.
- Change in local tax bases of greater than 10 percent.

- The change in area population is 10 percent or more in any one year or the change in population composition (race, age, sex or ethnicity) is greater than 10 percent for a period of two or more years.

- Shifts in the contributions among sectors to total regional or local employment are 10 percent or more for any given sector for a period of one or more years.

- Adequate housing accomodations are not available within a commuting distance of 170 miles roundtrip.

The local and non-local composition of the construction work force were determined through assessing local skilled and unskilled labor force availability, and reviewing literature such as the Pipeline Construction Worker Profile (Mountain West 1979) and various EISs prepared for other pipeline projects. A local worker is identified as a worker who is able to communte to and from his permanent place of residence on a daily basis. A non-local worker is identified as a worker who has moved into the construction area for the duration of the project. Affected communities were identified along each pipeline spread based on commuting distance, access, driving time, and housing availability. The following regional analysis inventories temporary accommodations and major services and facilities, and provides a description of the revenue sources to the counties potentially affected by the construction of the pipeline.

4.2.8.1 Las Flores to Emidio

Getty

Construction

Three pipeline spreads of 56 workers each would construct the 113-mile Getty pipeline. In addition to pipeline construction, two to three pump stations, requiring 20 workers per pump station, would be built. Unlike the pipeline workers who move along the route at a rate of 1 to 2 miles/day, the pump station construction force would generally stay in one location for a period of six months. The potential peak construction work force would total 252 workers, assuming three pump stations are constructed, three block and check valve crews are employed, and the three spreads would be constructed simultaneously.

Based on the existing labor force in Santa Barbara, San Luis Obispo, and Kern Counties, it is assumed that local resources would provide 50 percent of the construction work force; the remaining 50 percent would come from non-local labor pools. Since there are no radical shifts in employment among sectors and the construction period is of a short duration, no significant employment impacts would occur, based on the significance criteria. The estimated average daily wage would be $186 per worker. Previous studies conclude that the adverse social and economic impacts of pipeline construction are minimal because of the quick pace and short duration of the construction schedule. The number of construction workers would be very small relative to the regional population. The largest population increase that could occur would be no greater than 0.04 percent in the San Luis Obispo area. The change in population is less than 10 percent and therefore does not represent a significant impact based on the significance criteria.

Increased spending in the local areas would result in increased retail sales to merchants, as well as increased sales tax to local taxing jurisdictions. If it is assumed that a non-local worker spends 37 percent of his gross earning on local expenditures, $69 per non-local worker per day would be expended locally. The overall impact of these expenditures would be positive.

In addition to construction worker local expenditures, other income generated by pipeline construction would include local material purchases and wages paid to the construction work force and Getty staff. It is assumed that the contractor would purchase as many materials as possible locally. These expenditures would include tools, fuel, oil, parts, and repairs. Smaller communities would benefit from fuel sales and repair expenditures. These expenditures cannot be quantified due to lack of information. See Table C-2 for construction workforce expenditure estimates.

None of the Getty work force spreads would be large enough to place a permanent demand greater than 25 percent of the current level of demand on local services such as police, medical facilities, fire or educational services; nor would the construction population cause any detrimental effects to community social well-being due to the temporary nature of the construction period and the low visibility of the project. No significant impact on the existing infrastructure would occur based on the significance criteria.

Because construction would be short in duration, housing preferences would be of a temporary nature. It is generally accepted that pipeline workers prefer to stay in accommodations closest to the pipeline. Based on literature reviewed and personal interviews with pipeline contractors, it is assumed that housing for the non-local pipeline work force would be divided as follows:

	Housed (%)	Total Non-Local Getty Workers Per Spread
Motel/Hotels	42	18
Rental Units	26	11
Recreational Vehicle Campers	28	12
Other	4	1
TOTAL	100	42

The one potential effect of the Getty pipeline workers on housing would be competition with travelers and recreationists for temporary accommodations. If construction would occur during the peak tourist season, the impact on tourist accommodations would be greater than if construction occurred during the off-season. Peak tourist season on the coast is summer and in the LPNF August through November. In any case, no significant impact would be experienced based on the significance criteria for temporary housing. The small number of non-local construction workers could be housed adequately by the existing supply of rental housing and temporary accommodations.

Construction demand for rental housing would be less than 0.2 percent of the vacant housing within the communities along the construction route. Even though there would be sufficient accommodations to house construction workers, commuting distances may average 100 miles per day at certain points in the LPNF. Table 4-9 shows communities that can provide housing along the route.

Operation

The Getty pipeline would permanently employ five people to maintain and operate the system. Operating headquarters would be located at the Consolidated Coastal Facility near Gaviota, California. This small work force would cause no significant socioeconomic ramifications.

The anticipated project-related assessed valuations for the first year of operations are compared with 1982 county-wide assessed valuation in Table 4-10. Each county would benefit from the increased tax base. Tax revenues have not been estimated because of the variability of tax rates. The most significant increase in the tax base, attributed to the Getty pipeline and facilities, would occur in Santa Barbara County, where total assessed valuation would increase by 0.5 percent. This increase is less than 10 percent and therefore does not represent a significant impact.

Celeron/All American

Construction

One spread of 279 workers would construct the Celeron segment of the pipeline. In addition to pipeline construction, 3 pump stations requiring 20 workers per station, and 3 river crossings requiring 50 workers, would be constructed. Unlike the pipeline workers who move along the route at a rate of 1 to 2 miles/day, the pump station workers would stay in one location for a period of 6 months, and the river crossing crews would require up to 6 weeks in one location. The peak construction work force would total 397 workers.

An estimated 10 construction workers would be required to construct 12 miles of 115-kV transmission line needed for the Sisquoc pump station. Transmission line construction would occur within a 12-month period. Due to the short duration of the construction period, the small workforce, and the sequential nature of the construction process, no significant impacts are anticipated from transmission line construction.

Local and non-local labor force has been estimated for this spread based on skilled and unskilled labor availability in Santa Barbara, San Luis Obispo, and Kern Counties. The California labor force has a fairly large contract construction employment sector and has trained and experienced pipeline workers in counties from which the labor force would be drawn. The labor force is assumed to comprise 50 percent local

TABLE 4-9

COMMUNITIES WITHIN COMMUTING DISTANCE OF PIPELINE CONSTRUCTION[1]

Construction Pipeline Spread	Communities with Accommodations within 20 Miles of Pipeline	Overnight Rooms	Recreational Vehicles Sites	Recreational Vehicles Parks	Communities with Accommodations within 20-60 Miles of Pipeline	Overnight Rooms	Recreational Vehicles Sites	Recreational Vehicles Parks
1	Buellton, Solvang, Santa Ynez, Las Olivas, Bullard	1,074	883	6	Santa Barbara	3,537	1,735*	17
	Santa Maria	966	NA[2]	4				
	Lompoc	313	0	0				
	Bakersfield	4,266	NA	8				
2	Bakersfield	4,266	NA	8				
	Boron, Tehachapi,	822	110	2	Victorville	608	NA	4
	Taft, Mojave, Rosamond, Other	163	NA	NA	Apple Valley	200+	NA	1
	Barstow	825	NA	6	Adelanto	31	NA	1
	Amboy	34	NA	NA	Needles	650	220	4
	Blythe	488	2,081	25				
3	Blythe	488	2,081	25	Parker	NA	98	1
	Ehrenberg	40	0	0	Chandler	211	NA	NA
	Quartzsite	30	4-5,000	NA	Phoenix Area	11,414	552	3
	Gila Bend	130	NA	NA				
	Goodyear	238	NA	NA	Tempe/Mesa	2,123	6,307	9
	Litchfield Park	224	NA	NA	Scottsdale	5,389	0	0
	Glendale	82	NA	NA	Apache Junction	126	2,089	4
	Casa Grande	363	62	15				
	Coolidge	37	NA	NA				
4	Coolidge	37	NA	NA	Tucson	7,490+	2,540	NA
	Florence	NA	867	1	Benson	50	23+	4
	Eloy	435	209	5	Kearney	45	NA	NA
	Orade	12	NA	NA	Safford	NA	24	NA
	Mamouth	15	NA	NA				
	Winkleman	NA	6	1				

TABLE 4-9 (CONTINUED)

Construction Pipeline Spread	Communities with Accommodations within 20 Miles of Pipeline	Overnight Rooms	Recreational Vehicles Sites	Recreational Vehicles Parks	Communities with Accommodations within 20-60 Miles of Pipeline	Overnight Rooms	Recreational Vehicles Sites	Recreational Vehicles Parks
4	Hayden	15	NA	NA				
	Willcox	324	NA	6				
	Lordsburg	300	70	4				
5	Lordsburg	300	70	4	Silver City	336	NA	1
	Deming	570	394	11				
	Las Cruces	1,463	NA	3				
	El Paso	5,624	534	13				
6	Kermit	120	12	1	Sierra Blanco	76	2	
	Monahans	197	25	1	Van Horn	500	17	7
	Crane	20	5	1	Pecos	634	25	1
	McCamey	74	NA	NA	Odessa/Midland	3,102	145	2
	Rankin	25	Some	1	Fort Stockton	715	50+	6
					Carlsbad, NM	1,230	NA	5

Source: ERT

[1]Number of overnight accommodations, recreational vehicles sites and parks are best estimates from available information sources.

[2]Not Available

*Countywide.

TABLE 4-10

PROJECT-RELATED CONTRIBUTIONS TO TAX BASE, GETTY

County	Miles	Estimated Valuation of Pipeline and Facilities (thousands $)	1982 Assessed Valuation (thousands $)	Pipeline % of Total Countywide Assessed Valuation	1982 Countywide Tax Receipts (thousands $)
Santa Barbara	57	45,886	8,958,231	0.51	$97,853
San Luis Obispo	31	20,233	5,029,639	0.40	57,984
Kern	26	17,969	20,953,827	0.08	223,704

Source: California Board of Equalization labor and 50 percent non-local labor. Since there are no shifts in employment among sectors and the construction period is of a short duration, no significant employment impacts would occur, based on the significance criteria.

Because of the short duration of pipeline construction for this spread, estimated at 6 months, it is assumed that only 15 percent of the total non-local work force would bring their families. Based on information from the Pipeline Construction Workers and Community Impact Survey's Report, completed in 1979, only 0.3 dependents per worker are estimated for each spread.

Impacts discussed in the Getty pipeline section would also apply to the Celeron pipeline.

Because the Celeron segment would consist of a large peak construction work force, it would be expected that retail sales and sales tax receipts in local communities would be higher than for Getty. Workforce expenditure estimates are shown in the appendix, Table C-1. Temporary housing demand would also be higher than Getty. Housing for the non-local pipeline work force would be divided as follows:

	Housed (%)	Total Non-Local Celeron Workers
Motel/Hotels	42	84
Rental Units	26	52
Recreational Vehicle Campers	28	56
Other	4	8
Total	100	200

As compared to the Getty work force, approximately 73 additional pipeline workers would require housing. However, demand for temporary housing will not exceed the existing supply, therefore no significant impact will occur based on the significance criteria.

The combined effects of the construction and operation phase of the Getty and Celeron pipelines between Las Flores and Emidio are summarized below:

	Total Construction Work Force	Estimated Assessed Valuation of Pipeline & Facilities (thousands $)	% of County-wide Assessed Valuations for 3-County Area
Getty	252	84,088	0.24
Celeron	397	86,485	0.25
TOTAL		170,573	0.49

4.2.8.2 Emidio to McCamey. Five spreads of 335 workers each would construct the 1,084-mile All American segment of the pipeline. Total work force required for each spread, including pump stations, valve workers, tank farm, and river crossings, range from 453 to 528 workers. These numbers represent peak work force. In each spread the pump station workers would generally stay in one location for 6 months. The tank farm construction force would require 75 workers for a period of 8 months and major river crossing construction would require between 50 to 75 workers (per river) for a period of approximately 6 weeks.

An estimated total of 65 construction workers would be required to complete sections of new transmission line along the route between Emidio and McCamey. Each section would average between 5 to 15 workers. Most sections are less than 10 miles long, except for the Cadiz line, which would be 37 miles long. Transmission line construction would occur within a period of 4 to 12 months. Due to the short duration of the construction period, the small work force, and the sequential nature of the construction process, no significant impacts are anticipated. If power to the Tejon pump station was provided by the existing 330 kV line adjacent to the site, a new substation would have to be constructed. Construction worker requirements would be similar to those for a transmission line.

Local and non-local labor force has been estimated for each spread based on skilled and unskilled labor availability in each of the pipeline spread regions. The five spreads are represented by the following: #2 - Emidio to Blythe; #3 - Blythe to Coolidge; #4 - Coolidge to Lordsburg; #5 - Lordsburg to Salt Flats; #6 - Salt Flats to McCamey. Both the California and Texas labor forces have a fairly large contract construction employment sector and have trained and experienced pipeline workers in counties from which the labor force would be drawn. The labor force is assumed to comprise 50 percent local labor and 50 percent non-local labor in spreads 2, and 6. In spreads 3, 4, and 5, local labor would represent 30 percent of the labor force, non-local 70 percent. Table C-1 in the appendix shows the breakdown on local and non-local workforce, time schedule, lodging requirements, and estimated worker expenditures for each spread. Since there are no radical shifts in employment among sectors and the construction period is of a short duration, no significant employment impacts would occur, based on the significance criteria. This includes the Indian reservations in Arizona that would be near the proposed pipeline ROW.

Because of the short duration of pipeline construction for any one spread, ranging from 3 to 8 months, it is assumed that only 15 percent of the total non-local work force would bring their families. Based on information from the Pipeline Construction Workers and Community Impact Survey's Report, completed in 1979, only 0.3 dependents per worker are estimated for each spread.

The number of construction workers would be very small relative to the regional population. The largest population increases would occur in New Mexico and Texas, along those portions of the route that are sparsely populated. The greatest increase in population from temporary settlement of construction workers would occur in the following locations: Upton County, Texas, 6.3 percent; Crane County, Texas, 6.1

percent; Hidalgo County, New Mexico, 6.1 percent; and Luna County, New Mexico 2.5 percent. The population influx would be of short duration, less than one year and population change is less than 10 percent, therefore no significant population will occur.

Applying the significance criteria outlined previously, no significant impacts from change in area population would be experienced anywhere along the pipeline. The total non-local population would not cause a significant long-term demand greater than 25 percent of the existing demand to any public or private infrastructure along the route, including police, medical facilities, fire or educational services. There would be no significant impact on employment along any of pipeline spreads because of the short duration of the construction period. Temporary impacts could occur on stretches of the line that are sparsely populated, such as Hidalgo, Luna, and Doña Ana Counties in New Mexico, and all of the rural counties in western Texas. The intensity of these short-term employment impacts would be dependent on the location of the construction contractor and where he hires the majority of his work force. The largest increase (0.2 percent) in total employment on any one spread would occur in New Mexico and western Texas.

Pipeline workers would be scheduled to work a six-day work week ten hours per day. Information supplied by Celeron estimates the average daily wage at $186 per worker.

Retail sales and sales tax would increase throughout the pipeline service communities. Income would be generated in two areas: income generated by the construction work force and Celeron/All American staff in the form of lodging, food, retail sales, and fuel; and income generated by the contractor for materials purchased in the local economy such as tools, fuel, parts and repairs where available. These purchases are not quantifiable for the most part, and therefore cannot be allocated to specific communities along the route. No multiplier effect would occur due to the short duration of the project in any one area.

The non-local work force living in rental housing is estimated to expend up to 37 percent of gross salary on local expenditures. These expenditures would increase income for local businesses and tax revenues for local communities.

Because construction progress would be rapid (1.5 miles per day), housing preferences are of a temporary nature. It is difficult to determine which communities would be most affected due to personal preferences for accomodations; some pipeline workers may prefer to travel extra miles per day in order to be located in a larger town with better accommodations and services, others may not. Based on literature reviewed and personal conversations with pipeline contractors, the breakdown on housing for the non-local pipeline workers is shown in Table C-1 in the Socioeconomic Appendix.

Housing problems would occur along the Celeron/All American pipeline route. Table 4-9 identifies communities with accommodations within commuting distances of the pipeline route. It also shows the total number of overnight rooms and recreational vehicle sites in the area. If all accommodations within each spread are tallied, there would be more than adequate accommodations for the construction workers. If each spread is divided into segments that represent reasonable commuting distances, there are a number of areas where housing availability would be lower. The two major areas of impact would be between Barstow and Blythe, California, and El Paso and Pecos, Texas.

Total mileage between Barstow and Blythe is approximately 240 miles. The only lodging between these two points is in Amboy, which has 34 units. Self-contained recreational vehicles would be able to stay close to the construction location, but total demand for both rental units and motels would total 169 units. Because of the lodging limitations, this stretch would require very long distance commutes. Needles, California is approximately 60 miles east of Cadiz, which is located halfway between Barstow and Blythe. Needles has adequate accommodations for the construction workforce. There are approximately 650 motel units and 220 R.V. sites available in Needles. The Cadiz tank farm construction workforce could temporarily locate in Needles and commute 120 miles daily to and from Cadiz. Blythe, California, which is located at the eastern end of spread 2, has limited overnight accommodations; there are currently a total of 488 rooms. If all non-local construction workers who prefer motel accommodations stayed in Blythe, 21 percent of the units would be occupied. Blythe is an important service center for Colorado River recreationists and experiences high occupancy rates during peak tourist season from April through September. Construction worker demand would conflict with tourist demand. Rental housing would also be impacted if all workers who prefer to rent units would locate in Blythe. The demand by construction workers for rental units would potentially occupy 31 percent of all vacant units.

Another area of potential impact to housing would be along spread #6 between El Paso and Pecos. The stretch of pipeline that runs from El Paso through Loving County north of Pecos is approximately 184 miles long. There are no overnight accommodations between these two points. Self-contained recreational vehicles would be able to camp along the route, but approximately 150 workers would be required to commute long distances daily. In general, western Texas provides few motel accommodations. The smaller towns closest to the pipeline, which do have accommodations, could experience 100 percent occupancies during the period of time construction workers would be in the area. This would inconvenience travelers who expected to stay in those locations overnight. Based on the significance criteria, significant impacts will occur at some points along these two stretches of pipeline due to lack of adequate temporary accommodations within a commuting distance of 170 miles round-trip.

Operation

The Celeron/All American pipeline would permanently employ 49 people to maintain and operate the system. Operating headquarters would be located in Midland, Texas. Maintenance crews would be located at different points along the length of the pipeline. This small work force would have no significant socioeconomic impact on any region along the pipeline.

The anticipated first-year project assessed valuations for each county traversed are compared with existing county-wide tax bases in Table 4-11. Anticipated assessed valuations for new transmission line sections along the route are shown in Table 4-12. Each county would benefit from the increased tax base. Tax revenues have not been estimated because of variability of tax rates from year to year. The most significant increase in the total tax base, attributed to the Celeron/All American line and facilities would occur in Hudspeth County, Texas, where total 1982 assessed valuation would increase by 13.5 percent. This is the only area which experiences a change in the local tax base greater than 10 percent which is considered a significant impact.

4.2.8.3 Summary. Applying the significance criteria outlined previously, no significant impact from changes in area population, employment, or demands on public services and facilities would be experienced. Five-year average occupancy rates for temporary housing along the proposed pipeline route are not available, therefore, potential significant impacts on housing cannot be quantified. It is assumed that short-term adverse impacts on housing would occur along sparsely populated segments of the pipeline.

Significant impacts due to lack of temporary housing within commuting distance would be experienced in two areas along the pipeline route; points between Barstow and Blythe and points between El Paso and Pecos, Texas. The 1982 Hudspeth County tax base would increase by 13.5 percent with the proposed pipeline.

4.2.9 Land Use and Recreation

The land use and recreation criteria used to determine significance are based on regulations and plans, existing and future land uses, and their compatibility with the proposed developments. Impacts would be considered significant if:

- Proposed development is neither compatible nor consistent with land use plans, regulations, or controls adopted by local, state, or Federal governments.
- Agricultural land conversion due to the Celeron/All American and Getty proposals or alternatives results in a reduction of 1 percent or more of the county agricultural land base.
- Long-term trends in urban growth patterns are altered.
- Total recreation demand in the study area increases by 10 percent or more over baseline conditions.
- Developed recreational facilities, state or national parks, or wildlife refuges have 5 percent or more of their land area permanently altered.
- The quality of recreational activities is decreased because of decreases in game population, increased demand, or any other reason.

TABLE 4-11

PIPELINE CONTRIBUTION TO COUNTY TAX BASE, CELERON/ALL AMERICAN

State/County	Length of Line (miles)	Estimated Taxable Assessed Valuation of Pipeline (thousands $)	1982 Total Countywide Assessed Valuation (thousands $)		Pipeline Percentage of Total Countywide Assessed Valuation (%)		1982 Countywide Tax Receipts (thousands $)
California[1]							
Santa Barbara	63.5	50,500	8,958,231		.53		97,853
San Luis Obispo	31.5	20,760	5,029,639		.42		57,984
Kern	110.1	65,478	20,953,827		.31		223,704
San Bernardino	157.7	94,835	19,950,620		.48		242,312
Riverside	30.1	14,886	18,567,137		.08		217,465
Arizona			Primary[3]	Secondary[3]	Primary	Secondary	
La Paz/Yuma[2]	72.9	18,860	267,153	284,180	7.3	6.6	4,028
Maricopa	66.5	17,698	5,257,522	6,034,315	0.3	0.3	415,214
Pinal	69.6	19,395	305,816	317,682	6.3	6.1	39,294
Pima	12.0	2,180	1,777,879	2,059,636	0.12	0.1	196,084
Cochise	75.2	19,278	259,329	271,153	7.2	7.1	22,067
New Mexico							
Hidalgo	22	1,275	89,222		1.4		2,060
Grant	18.2	318	143,160		0.2		4,748
Luña	41.7	729	66,268		1.1		1,638
Doña Ana	45	1,677	348,824		0.48		7,152

TABLE 4-11 (CONTINUED)

State/County	Length of Line (miles)	Estimated Taxable Assessed Valuation of Pipeline (thousands $)	1982 Total Countywide Assessed Valuation (thousands $)	Pipeline Percentage of Total Countywide Assessed Valuation (%)	1982 Countywide Tax Receipts (thousands $)
Texas					
El Paso	28	13,370	15,288,040[4]	.09	75,613[5]
Hudspeth	63.3	33,051	243,858	13.5	1,157
Culberson	54.9	26,215	694,437	3.8	2,671
Reeves	14.4	6,876	1,327,418	0.52	9,056
Loving	26.9	12,845	1,173,427	1.09	2,122[6]
Winkler	18.3	12,683	2,249,452	0.56	6,728[6]
Ward	19.5	9,311	2,532,420	0.37	13,841
Crane	40.8	20,602	4,312,487	0.48	7,686
Upton	7.1	4,510	1,395,496	0.32	5,846

[1]California has recently begun to levy a ROW tax; the estimated valuation corresponding to this tax is not included.

[2]La Paz County did not incorporate until January 1983.

[3]Arizona operates under two distinct valuation bases for levying ad valorem property taxes: limited property value and full cash value.

[4]1982 Assessed Valuations include assessments for school districts traversed by the pipeline and county assessments.

[5]1982 tax receipts include tax levies for school districts traversed by the pipeline and total county levies.

[6]The Winkler and Loving school districts have consolidated. For estimation purposes, tax receipts for the district have been distributed 50 percent to Loving County and 50 percent to Winkler County.

TABLE 4-12

TRANSMISSION LINE CONTRIBUTION TO COUNTY TAX BASE

CELERON/ALL AMERICAN

State/County	Length of Line	Estimated Taxable A.V. of Transmission Line (thousands $)[1]	1982 Countywide A.V. (thousands $)	Estimated Transmission Line Percentage of Total Countywide A.V. (%)
California				
Santa Barbara	12	1,166	8,958,231	.01
Kern	20.5	1,991	20,953,827	.009
San Bernardino	<1	1,026	19,950,620	.005
Riverside	37	7,400	18,567,137	.04
New Mexico				
Hidalgo	8	619	89,222	.69
Doña Ana	<1.4	182	348,824	.05
Texas				
Hudspeth	<1	1,556	243,858	.64
Winkler	<1	1,943	2,249,452	.09

[1]Assessed valuations are estimated based on the following formula: construction costs minus depreciation (35-year straight line method) times an assessment ratio when appropriate. Source for transmission line construction costs: John Oveson, All American Pipeline Company; Chuck Peterson, Marmac Engineering.

- Existing wilderness areas or areas currently under consideration for wilderness [Wilderness Study Areas (WSAs) or Further Planning Areas (FPAs)] are directly or indirectly or impacted by pipeline construction or operation.

- The quality of the experience of wilderness area users is affected by increased use demand (10 percent or greater) or degradation of air quality, water quality, flora, or fauna.

- Pipeline ROWs provide uncontrolled access to sensitive areas that were previously inaccessible.

- The danger of forest and range fires is increased by construction activities starting a fire or impeding access of fire equipment.

The following analysis is divided into project effects on land use, compatibility with land use regulations and plans, and impacts on recreation facilities and use.

4.2.9.1 Las Flores to Emidio

Land Use. Along the Santa Barbara south coast the greatest potential for impacts would be associated with agricultural and recreational land uses and the Vista del Mar School. The route from Las Flores to Gaviota passes through limited areas of avocado orchards and other irrigated cropland (Table 4-13). Agricultural lands disturbed by construction would represent less than 1 percent of the irrigated cropland in the county. Santa Barbara County, through its zoning ordinances, prohibits high-density residential development along the coast west of Goleta. The pipelines, therefore, would not be expected to have any significant effects on future residential development along the coast.

TABLE 4-13

CONSTRUCTION DISTURBANCE BY LAND USE GETTY AND CELERON PIPELINES (acres)

Feature	Rangeland	Shrubland & Woodland	Irrigated Agriculture	Dryland Agriculture	Commerical Industrial	Commercial Residential	Other
Getty Pipline[1]	384	218	128	16	15	4	15
Pumping and Heat Station	6						
Celeron Pipeline[2]	792	361	251	12	32	9	16
Pumping and Heat Station[3]	9						
Grand Total	1,247	618	501	24	61	18	46

Source: ERT
[1]For Getty, 99 miles of the ROW would be 50 ft wide and 14 miles of the ROW would be 100 ft wide.
[2]ROW width would be 100 ft
[3]Actual acreage is 8.5 acres, rounded to 9.

The Celeron pipeline segment would cross over the eastern boundary of Gaviota State Park about 0.3 mile inland, cross under US 101, and ascend Gaviota Pass about 0.6 mile from the northern portion of the Fremont-Foxen Historical Marker Rest Area (Table 4-14). Getty's route would be within an existing ROW and would be adjacent to the southern part of this rest area. As described later, the Getty routing would temporarily disrupt use of this recreational facility.

TABLE 4-14

THE LOCATION AND TYPE OF SENSITIVE LAND USES

Map Code	Location	Sensitive Characteristics	Potential Problems
CELERON/ALL AMERICAN AND GETTY			
California			
L1	2 miles east of Corral Canyon	El Capitan State Park	Disruption of park activities
L2	2.5 miles west of Corral Canyon	Refugio State Park	Disruption of park activities
L3	Adjacent to Gaviota Pump Station	Vista del Mar School	Disruption of school activities
L4	4 miles west of Gaviota	Gaviota State Park	Disruption of park activities
L5	8 miles northwest of Gaviota	Gaviota Pass Rest Area	Disruption of recreation activities
L6	Town of Buellton	Residential development	Disruption of residential activity
L7	13 miles north of Buellton 12 miles west of New Cuyama	LPNF	Disruption of recreation and grazing activities Wilderness impacts.
L8	LPNF	Horseshoe Springs Further Planning Area	Impacts to recreation areas and Horseshoe Springs Further Planning Area (FPA)
L9	LPNF	Miranda Pine FPA	Impacts to the FPA
L10	LPNF	La Brea FPA	Impacts to the FPA
L11	LPNF	Spoon Canyon FPA	Impacts to the FPA

TABLE 4-14 (CONTINUED)

Map Code	Location	Sensitive Characteristics	Potential Problems
CELERON/ALL AMERICAN			
L12	Tehachapi Pass	Pacific Crest National Scenic Trail	Disruption of recreation activities
L13	Cummings Valley	Residential Area	Disruption of residential activities
L14	West of Barstow	Edwards Air Force Base	Disruption of base activities
L15	Town of Barstow	Residential areas	Disruption of residential activity
L16	North of Desert Center	Patton Camp ACEC	Impacts to historic area
L17	North of Desert Center	Coxcomb WSA	Impacts to WSA
L18	Colorado River south of Blythe	Recreational use of river	Impacts of recreation activities
Arizona			
L19	East of Blythe	Kofa NWR	Conflicts with refuge management plans
L20	North of Kofa Refuge	New Water Mountains WSA	Impacts to WSA
L21	East of Kofa Refuge	Little Horn Mtns. WSA	Impacts to WSA
L22	East of Kofa Refuge	Eagletail Mtns. WSA	Impacts to WSA
L23	South of Buckeye	North Maricopa Mtns. WSA	Impacts to WSA

TABLE 4-14 (CONTINUED)

Map Code	Location	Sensitive Characteristics	Potential Problems
New Mexico			
L24	Town of Lordsburg	Residential area	Disruption of residential activities
L25	Town of Reming	Residential area	Disruption of residential activities
Texas			
L26	Northwest of El Paso	Ft. Bliss Military Reservation	Disruption of base activities
L27	East of El Paso	Guadalupe Mtn. National Park	Disruption of recreation activities
L28	East of El Paso	Hueco Tanks State Park	Disruption of recreation activities
L29	Town of Wink	Residential area	Disruption of residential activity
L30	Town of Monahans	Residential area	Disruption of residential activity

Source: ERT

The Celeron route traverses the Santa Ynez Valley west of the community of Buellton and the Getty route goes east of US 101. Both routes cross substantial areas of irrigated cropland that would have farming interrupted for up to one season. Northeast of Buellton the routes would pass through limited areas of vineyards that would have long-term loss of production because of long regeneration times. Land owners would be compensated for this loss of revenue.

Before reaching Emidio the pipeline would pass through irrigated cropland in San Luis Obispo and Kern Counties. Pipeline construction would disturb less than 1 percent of each countys' total cropland acreage; the loss in production would be one growing season or less. The possible exception would be if nut, citrus or vine crops were removed. The land owners would be compensated for any losses.

The transmission line options supplying power to the Sisquoc pump stations would not result in significant adverse land use impacts because they would not cross any residential, agricultural land, or areas of high scenic value.

The pipeline ROW passes through mountainous coastal and inland areas that are susceptible to forest and range fires. Pipeline construction and operation may slightly increase the risk of fire starts in chaparral and wooded areas; however, where the ROW would function as a fuel break, access for fire suppresion purposes would be enhanced. On National Forest land a fire plan would be developed to reduce the risk of forest fires during construction and operation. For all areas, major roads would not be closed by construction, allowing normal access for fire suppression equipment.

Land Use Regulations and Plans. The siting and design of the pipelines would be consistent with adopted land use regulations and plans, with the following exceptions:

Santa Barbara County, Local Coastal Plan - the proposed project is not consistent with the following Coastal Plan policies.

Policy 6-14 - the Celeron and Getty routes would cross Gaviota Creek, an environmentally sensitive habitat area.

Policy 6-17 - pipeline alignment generally avoids known important recreation, habitat, and archaeological areas. The only possible exceptions would be after the pipeline enters Gaviota State Park. The Celeron route goes through a low-use area of the park, is screened from most of the park uses, and may be consistent with this policy. The Getty ROW would impact the US 101 Roadside Rest Area and for this reason it may not be consistent with this policy.

In many areas both the Celeron and Getty pipelines would parallel each other to form a 150-ft wide ROW corridor. Disturbance to land use, especially in Gaviota State Park, environmentally sensitive habitat areas, and La Brea Canyon could be reduced if both lines were constructed in the same ROW. This would be consistent with existing county and Forest Service land use regulations.

San Luis Obispo County: The proposed pipeline would cross a flood hazard area. A development plan would be required for construction approval.

California Department of Park and Recreation: The Celeron pipeline segment would be within a new ROW in Gaviota State Park while the Getty pipeline would parallel an existing ROW through the Park. Proponents would need to secure an easement and follow stipulations issued by the California Department of Parks and Recreation. Alignment of the pipeline avoids unique and or high recreation use areas shown in the Gaviota Park Plan.

Los Padres National Forest: The Getty route up La Brea Creek would pass through two Forest Service FPAs. Celeron's ROW would cross the same two FPAs and one additional study area. Pipeline construction would result in significant adverse effects on wilderness characteristics of the Horseshoe Springs and Spoor Canyon FPAs because of reductions in their integrity, natural appearance, and opportunities for solitude. The other FPAs would not be significantly affected because the proposed pipeline ROW has already been disturbed and noise impacts would be of a short duration. See Appendix D for a detailed analysis of impacts to these FPAs. Future utilities could be accommodated within the cleared ROW through the use of special construction techniques. Approval of a ROW and any stipulations would be contained in the EIS Record of Decision.

<u>Recreation Facilities and Use</u>. Alignment of the Celeron and Getty pipelines would avoid disturbance to El Capitan and Refugio State Parks. Indirectly, Refugio could be affected by pipeline construction workers competing with recreationists for limited campsites, especially during the summer high use period when all sites are normally full (Preec 1984, personal communication). View corridors would not be crossed.

The Celeron ROW through Gaviota State Park crosses under the beach access road and Gaviota Creek floodplain before ascending through relatively low use portions of the park. This route would not significantly affect recreation use, as long as the beach access road remains passable during construction. Revegetation of the ROW to reduce visual impact would be performed.

Getty's route passes adjacent to a segment of the roadside rest area for northeastern bound traffic on US 101 at Gaviota Pass. Some disruption of activity at the rest area would occur during construction. Extensive earth moving would be required through exposed rock outcrops that are visible from the rest area and highway. This part of the ROW would present short-term adverse effects during construction because of the disruption of activities at the popular rest area and a long-term effect because of ROW visual disturbances.

La Brea Canyon is a moderately used recreation activity corridor with four Forest Service campgrounds. Three of the campgrounds would be directly affected by construction. Even after these campgrounds are restored, the clearing of large oak and sycamore trees would result in a drastic visual change in the area. This would significantly reduce the canyon's recreational appeal and use in the long term. Removal of a portion of the isolated stand of Colter pine near Miranda Pine Campground would be a significant change in the aesthetic quality of the campground.

4.2.9.2 Emidio to Blythe

Land Use. The greatest potential for adverse impacts from pipeline construction exists in areas with agricultural, residential, and recreational land uses. A total of 352 acres of irrigated cropland would be crossed by the proposed route and pump stations (Table 4-13). Within the affected counties, disturbance to irrigated cropland would not be considered significant because it represents less than a 1 percent reduction in any county's agricultural base. Although the disruption to farming activities would be for a short duration during construction, it may result in delays in some planting or harvesting, depending on the time of construction and layout of the field. Land owners would be compensated for losses.

Rangeland would be the dominant land use crossed by the pipeline, making up 83 percent of disturbance (Table 4-15). Temporary gates and other measures would be erected to prevent livestock escape. Grazing land affected during construction represents a very small percentage of available land and after restoration is complete, grazing would again be possible.

TABLE 4-15

CONSTRUCTION DISTURBANCE BY LAND USE AND BY STATE ALL AMERICAN PIPELINE[1]

(Acres)

State	Rangeland	Woodland	Irrigated Agriculture	Dryland Agriculture	Commercial/ Industrial	Residential	Other
Pipeline							
California	2,939	45	352	21	103	53	51
Arizona	3,590	84	495	22	29	25	0
New Mexico	1,538	0	146	33	66	0	114
Texas	3,312	0	0	16	51	6	76
Pumping and Heat Stations							
California	17	0	6	0	0	0	0
Arizona	28	0	0	0	0	0	0
New Mexico	11	0	0	0	0	0	0
Texas	11	0	0	0	11	0	0
TOTAL Project	11,446	129	999	81	260	74	241
GRAND TOTAL							13,230

Source: ERT

[1]Assumes a ROW width of 100 ft.

Areas of concentrated residential land use along the ROW are found primarily in Kern County within the Cummings Valley, San Bernardino County within unincorporated areas north of Barstow, and Riverside County in the Town of Blythe. Other segments of the route are undeveloped open space land or have only scattered residential units.

For homes within about 0.5 mile, noise and visual impacts would be significant but of short duration (between 1 and 2 days maximum). See the Noise and Visual Sections for more detailed information.

Since the All American Pipeline segment parallels existing pipelines, it would not create any new ROWs going through or adjacent to any urbanized areas. Consequently, significant long-term impacts to urban growth patterns would not occur.

Sensitive recreational land uses are located primarily in the California Desert, and at the Colorado River crossing. See the following Recreation subsection for more detailed information on potential recreation impacts.

No significant impacts are expected from the Tejon pump station transmission line because it would be within the proposed pipeline ROW and would disturb only a small amount of irrigated agricultural land (2.4 acres) and grassland (0.8 acre). After construction a portion of this cropland would be reclaimed. Construction and operation of the transmission line to the Cadiz pump station would present no significant land use impacts. A total of 90 acres would be disturbed by this line, primarily for the 20-ft access trail. The proposed route would not impair the wilderness characteristics of WSAs 299 or 300.

The pipeline route would pass through areas where, depending on the time of year and weather conditions, forest and range fire potential is very high, especially the Tehachapi Mountains. Potential impacts from pipeline construction on fire danger for these segments would be similar to those described for the Getty and Celeron pipelines.

Land Use Regulations and Plans. The proposed pipeline route would generally be consistent with land use regulations and plans. Beginning with county plans, the following discussion describes potential conflicts with specific provisions of land use plans.

Developers of residential and other projects in California are able to file Specific Development Plans (SDPs), depicting the design and layout of their developments, with the county planning department. An SDP has legal status similar to a county master plan. Several residential subdivisions crossed by the pipeline have filed SDPs in the Cummings Valley, Kern County. An amendment to the SDP may need to be filed by the pipeline proponent, depending on an interpretation of the SDP by the county planning office (Kielty 1984, personal communication). Such an interpretation has not been made by Kern County at this time.

Within San Bernardino County, the Joint Utilities Management Program (JUMP) imposes siting and design criteria and a siting and approval process. Of primary concern in the JUMP is that "new pipeline corridors should be consolidated with existing pipeline or electrical transmission line corridors except where there are technical or overload constraints or where there are social, aesthetic, significant economic, or other overriding concerns." The All American ROW generally parallels existing roads, railroads, and pipelines in the county, and therefore, is consistent with the intent of the JUMP. Final approval of the ROW would, however, be required from the county.

The proposed route is inconsistent with the utility corridors identified in the Riverside County Comprehensive General Plan. Present utility corridors are defined in an "advisory" context and can be administratively modified by the Planning Department without requiring formal amendment. No action would be taken until BLM modifies the utility corridors of the California Desert Conservation Plan and All American formally requests a modification to the Riverside County Comprehensive General Plan (McCall 1984, personal communication).

The BLM California Desert Conservation Area Plan (BLM 1980c) lists approved utility corridors for pipelines and electric transmission lines. Even though the All American pipeline route through the desert parallels existing highway, railroad, or pipeline ROWs, a large segment of the proposed route is not within a designated BLM utility corridor and is inconsistent with the Plan provisions. Project proponents have submitted ROW applications to the BLM and this EIR/EIS will serve to amend the Plan. The Palen-McCoy WSA would be crossed by about 8 miles of the proposed route. This location will have a significant adverse impact on the WSA (see Appendix D for a detailed discussion).

Edwards Air Force Base would be crossed by 2.6 miles of the pipeline ROW. Special stipulations to protect environmental features or avoid conflicts with base operations may be required (Yonkers 1984, personal communication). The ROW would not cross the Twentynine Palms Marine Corps Base or the Marine Corps Nebo Supply Base.

Recreational Facilities and Use. Recreation demand generated by the construction work force is not expected to have significant adverse impacts on regional recreation resources along the route because the 335-man crew for each spread would be a very small percentage of the recreation users in any region. For example, the California Desert receives several million visitors per year (BLM 1980c). Potential conflicts would occur when construction takes place during peak use seasons and where there is a shortage of campsites or motel rooms (see the Socioeconomic Section). Under these circumstances workers would be competing with recreationists for limited temporary housing.

Pipeline construction should have only a short-term effect (1 to 2 days) on use of the Pacific Crest National Scenic Trail near Tehachapi Pass. In the California Desert it would pass through public lands that are popular with ORV users but it avoids areas classified as "open" for cross country travel. Impacts from project construction would be short term and would only present a nuisance rather than a significant impact to ORV recreationists, since ORV users are limited to existing roads or trails, detours or road closure signs would be erected at road crossings, and construction would progress at an average of 1.5 to 2 miles per day. Major access roads would not be closed to traffic. There would be adequate space to accommodate ORV use and pipeline construction.

The ROW would provide access to some areas not now accessible by motor vehicle. This new access could, however, result in the proliferation of spur roads and impacts to fragile resources. New spur roads would be in conflict with BLM recreation management policy that seeks to restrict ORV use to the adequate number of existing roads and trails (BLM 1980c). This is considered a significant adverse impact, unless access is controlled or limited.

Completion of the Colorado river crossing would require a total of about six weeks. The two days required to pass the pipe across the river would result in detours and minor delays in recreational use at that point on the river by fishermen, boaters, and water skiers. Boats travel up and down the river from launch sites around the town of Blythe, including Mayflower County Park and the Blythe Marina located about 0.5 mile upstream of the crossing. If construction were to occur during the peak use season (April through August), especially on or near holidays or spring weekends, the degree of disruption would increase substantially. If, however, construction were completed during the lowest use period (November through January), impacts would be minor.

Fishing for catfish and bass is popular year round at the Colorado River crossing. As described in the Aquatics Section, impacts to recreational fishing from pipeline construction would not be significant. Oil spill impacts could taint fish for several months and render the fish undesirable for eating.

4.2.9.3 Blythe to McCamey

Land Use. The greatest potential for adverse impacts from pipeline construction would be in areas with agricultural, residential, and recreational land uses. A total of 641 acres of irrigated cropland would be crossed by the proposed route and pump stations. Within the affected counties, disturbance to irrigated cropland would be as high as 281 acres in Pinal County, Arizona. This effect would not be considered significant because it represent less than a 1 percent reduction in the county agricultural base. No other county would have more than 1 percent of their cropland disturbed by the project. Although the disruption to farming activities would be for a short duration during construction, it may result in delays in some planting or harvesting, depending on the time of construction and layout of the field. Land owners would be compensated for losses.

Rangeland would be the dominant land use crossed by the pipeline, making up 88 percent of disturbance. Temporary gates and other measures would be erected to prevent livestock escape. Grazing land affected during construction would represent a very small percentage of available land and after restoration is complete, grazing would again be possible.

Areas of concentrated residential use would be limited to Lordsburg and Deming, New Mexico, and Monahan, Texas. Other segments of the route are open space land or only have scattered residences. Construction of a new ROW corridor could have potentially long-term effects on urban growth patterns. Since the Celeron/All American pipeline parallels existing pipelines it would not create any new ROWs going through or adjacent to any urbanized areas. No significant long-term impacts to urban growth patterns would occur.

No significant impacts are expected from the Lordsburg, Anthony, Salt Flats and Wink transmission lines because construction would not affect sensitive land uses in the area.

Land Use Regulations and Plans. The proposed pipeline route generally is consistent with land use regulations and plans. Beginnning with county plans the following discussion describes potential conflicts with specific provisions of land use plans.

The pipeline route proposes to cross the Kofa NWR, Arizona. FWS policy encourages the siting of industrial facilities outside of a refuge if possible. The Regional Director of the FWS will need to determine if the project is compatible with refuge operations.

The proposed pipeline would be adjacent to an existing El Paso Natural Gas Company pipeline through Fort Bliss Military Reservation in Texas. Once a required cultural resources survey of the ROW and other stipulations have been completed, the proposed project would be consistent with U.S. Army requirements (DeGarmo 1984, personal communication).

Recreational Facilities and Use. Recreation demand generated by the construction work force is not expected to have significant adverse impacts on regional recreation resources along the route.

Pipeline construction would affect 25 miles of the Kofa NWR. This represents less than a 1 percent disturbance to the 660,000-acre refuge. The greatest impacts to recreationists using the commonly travelled road along the existing pipeline would last about 16 days (assuming a 1.5-mile per day construction rate, with additional time needed for ROW preparation, cleanup, and restoration). This road has a large amount of recreation use, compared to other parts of the refuge, because of the easy 2-wheel-drive access it provides (Haderlie 1984, personal communications). Long-term impacts to recreation, including aesthetic impacts, are expected to be minimal because the pipeline would be buried and would parallel an existing gas pipeline and 500-kV transmission line.

The existing El Paso pipeline ROW forms the northern border of three BLM wilderness study areas east of the refuge. As proposed the All American Pipeline would be to the north of the existing ROW and would be located outside the WSAs. BLM management policy in regard to WSAs does not permit any new ROWs (BLM 1981). Construction and operation would not result in adverse effects on the wilderness character of the WSAs because the area's naturalness, solitude, or unique features would be basically unchanged. See Appendix D for a detailed discussion of potential effects on wilderness character.

There are no other major local, state, or national recreation areas that would be impacted by the remainder of the pipeline route. Recreation use over the remaining sections in Arizona, New Mexico, and Texas is generally dispersed and should not be adversely affected by the proposed pipeline.

4.2.9.4 Summary. In summary, the Celeron/All American and Getty proposals would not be consistent with land use policies prohibiting disturbance of recreation areas and environmentally sensitive habitats in Santa Barbara County. The corridors would cross several areas designated for FPAs in the LPNF. Significant impact to recreation resource in La Brea canyon would occur. The proposals would also provide new access, in some cases, to previously inaccessible sensitive areas. The All American segment in the San Bernardino and Riverside Counties would require modification of county plans and the BLM California Desert Conservation Area Plan because it is not consistent with the designated utility corridors. Palen-McCoy WSA would be crossed by the proposed route. The FWS must also make a determination of consistency for the crossing of the Kofa NWR. Finally, the quality of recreation experiences at some recreation areas would be adversely affected by visual changes from ROW clearing.

4.2.10 Transportation

The dominant potential transportation impact associated with the proposed project involves the disruption of traffic on roadways to be crossed by the pipeline. Disruption of traffic flows would be considered significant if:

- The traffic increase, particularly over the long term, would cause an instability of traffic flow, noticeable congestion, and/or a substantial increase in average travel time.

- Traffic delays are incurred due to pipeline construction of more than 60 minutes (on minor arterials) during low-use periods and more than 30 minutes on principal arterials and major collectors.

- There would be any permanent impact to roads or rail networks, other pipeline systems, or electrical power transmission systems.

- Emergency access to any portion of the pipeline corridor would be precluded by pipeline construction.

4.2.10.1 Impacts to Transportation. The Celeron/All American and Getty pipelines from Las Flores to Emidio would cross essentially the same highways and be accessed by the same roadways. The impacts on transportation for both the construction and operation of these two portions of the pipeline would therefore be similar.

The proposed pipeline route from Las Flores to McCamey, Texas would cross 61 state and Federal roadways and numerous minor roadways (both public and private) throughout the states of California, Arizona, New Mexico, and Texas. The crossing of these roadways would be undertaken by boring and installing the pipeline underneath the road ROW. As a general rule, traffic flow on these roadways would not be interrupted. Construction activities may occur within the road ROW but are planned to not interrupt the flow of the roadway itself. No state or Federal roadways would be subject to any interruption of traffic flow or control of traffic.

Some minor county or Forest Service roads may require control of a minimal amount of traffic (i.e., proper signing, barriers, or flagmen). However, temporary access across or around roadways where service would be interrupted would be provided; there would be some congestion in these areas of temporary disruption for 1 or 2 days. Emergency access would be provided under these conditions. Impacts of increased access to National Forest, NWR, and public (BLM) lands are discussed under Land Use and Recreation and in Appendix D.

Slowly moving heavy construction equipment would be moved to the ROW via major highways along the pipeline route. Once the pipeline ROW is accessed, the construction equipment would be restricted to movement along the pipeline ROW; there after, the only potential for interruption of traffic flow would occur at highway crossings as the equipment moves from one side of the roadway to the other. During the movement of the heavy equipment on and over highways, some congestion would occur. This would result from the need to stop traffic to allow for the crossing of heavy equipment as well as the need to reduce traffic speeds of cars following the heavy equipment along the roadways. Precautions including flashing lights, flagmen, and signing would be taken to ensure that safe operations within the highway ROW would occur. These interruptions would occur infrequently, about once every 20 days, and be of short duration (several hours).

During the construction phase construction workers would need to access the pipeline ROW daily through the use of the local roadway network. The construction workers would travel by private automobile (assume one construction worker per vehicle) to the nearest access point to the construction area. Vehicles would be parked along the pipeline ROW away from public roadways. On an average day a maximum of 335 construction workers (Getty and Celeron combined or maximum All American spread) would access the pipeline ROW via the nearest major roadway to the construction site resulting in an estimated 335 auto movements. The construction workers are expected to commute to the site during the hours from 6:30 to 7:30 a.m. and 4:30 to 5:30 p.m., times that correspond typically to the beginning and end of the morning and evening peak hours, respectively. During these times, additional congestion on access roadways is expected to occur, however, this congestion for a brief period in the morning and evening hours would take place on any single roadway for only an average 20-day period. At the end of this period, the spread would have moved to a point along the line close to another access road. Typically the access points to the pipeline would occur on state and Federal roadways in rural areas. The congestion would occur only for a short duration and generally in rural, lightly populated areas.

The addition of 20 operation personnel at McCamey, Texas would not impact transportation.

4.2.10.2 Summary. In summary, the transportation effects of the Celeron/All American and Getty proposals would not be considered significant. All contributions to traffic congestion would be minor and of short duration. Traffic delays would be minimal because all major highway crossings would be tunneled without cutting the travel surface and equipment crossings would be carefully monitored and controlled. There would be no permanent impact to major transportation or utility networks. Finally, access would be maintained on existing roads at all times during construction, thus maintaining emergency access throughout the development of the project.

4.2.11 Cultural Resources

The criteria for evaluating cultural resources on Federal lands and lands impacted by federally funded or licensed projects are the eligibility criteria of the National Register of Historic Places, 36 CFR 60.4 (revised November 1981). The criteria apply to resources (historic and prehistoric sites) significant at the national, regional, state, and local levels. Adverse effects on resources that produce direct or indirect impacts (36 CFR 800.3) are considered for sites listed on the National Register of Historic Places or which meet the criteria of eligibility.

For purposes of the California Environmental Quality Act (CEQA), the criteria for evaluating cultural resources on state and private lands in California are significance criteria listed in Appendix K of the California Administrative Code, Title 14 Natural Resources, Division 6, Resources Agency. Effects which cause damage to cultural resources are considered for sites which meet these criteria.

Federal agencies cannot authorize federally licensed projects without prior compliance with Section 106 of the National Historic Preservation Act. This involves consultation with the State Historic Preservation Office (SHPO) and the Advisory Council on Historic Preservation to determine the existence and significance of cultural resources sites and the development of procedures to mitigate adverse effects. The information provided in this section is intended for use in the consideration of various project alternatives. Prior to authorization of the start of pipeline construction activities, all Federal lands will be subjected to a complete (Class III) inventory and an evaluation of cultural resources and project effects in consultation with the affected SHPOs and the Advisory Council.

Cultural resources impacted by the Celeron/All American and Getty proposals include archaeological and historical sites that are located in areas which would be directly or indirectly affected by project construction and facilities operation. Sites located within the pipeline ROW would be exposed to potential direct and indirect impacts while sites located outside the ROW would be exposed to potential indirect impacts only.

Direct impacts would result from actual surface disturbance of a site's spatial configurations or stratigraphy during a facility's construction or use. In this case construction and maintenance activities described in Section 2.2 would disturb or destroy cultural resources, including clearing and grading, ditching, hauling and stringing, pipe placement, and backfilling. Disturbances by project-related vehicular activity would also occur within the project ROW and along access roads.

Indirect impacts refer to the increased potential for site disturbances due to a general intensification of land use activities in the area surrounding cultural sites. The construction or improvement of roads for project implementation purposes would make previously recorded sites in the surrounding project area more accessible. Many cultural resources have undergone varying amounts of previous disturbance due to non-professional excavation and the search for collectable items.

Two major difficulties are involved with assessing impacts to cultural resources. First, not all portions of the pipeline route have been surveyed, so not all cultural sites that may exist within and adjacent to the ROW have been identified. Secondly, many known sites have not been evaluated as to their eligibility for National Register designation. For these reasons, cultural resource impact assessment at the time an EIS is prepared is usually incomplete. To rectify this acknowledged shortcoming, the land management agencies (BLM, Forest Service, FWS, and DOD) will develop a formal compliance plan for the mitigation of potential impacts to cultural resources for all aspects of the Celeron/All American and Getty proposals. This plan will include the identification of cultural resources that may be impacted by the projects, submittal of information on potentially significant resources to the SHPO for evaluation of significance; consultation with the Advisory Council on Historic Preservation on the effects of the projects on significant resources; and implementation of a cultural resources mitigation program. The compliance plan will include a plan for additional surveys and data collection for all proposed areas of disturbance. More detail on the compliance plan is contained under mitigation measures at the end of this chapter.

It should be noted that Fort Bliss (Texas) has a programmatic agreement with the Texas SHPO involving a formal historic preservation plan. This plan has been reviewed and approved by the Advisory Council. All survey and mitigation plans pertaining to the pipeline on Fort Bliss will be performed in accordance with the programmatic agreement.

The process of formally evaluating cultural resources using regulatory criteria is often a complex, expensive, and time-consuming process, involving several phased procedures. It should be noted that all cultural resources can make contributions to archaeological and historical research. Various levels of data collection ranging from professional site recordation to complex data recovery programs, are possible depending upon the extent and significance of a cultural resource. However, site evaluation and data collection and cultural resource disturbances can be limited if cultural resource sites can be avoided during detailed project design and final ROW selection.

No ethnographic sites along the pipeline ROWs have been identified to date by any Native American groups; however, impacts to unknown sites could still occur, and potential impacts will be evaluated as sites are identified. Potentially significant historic and archaeological sites which have been identified for each segment of the pipeline routes are described in the following paragraphs.

4.2.11.1 Las Flores to Emidio. Thirteen of the 72 known cultural resource locations identified within 0.5 mile of the proposed Celeron route would be within the ROW. These sites include five campsites, three villages (at least one with a burial area), one bedrock mortar, two rock shelters, and two historic sites. Sixteen of the 49 sites within 0.5 mile of the proposed Getty route would be within the ROW. These include 2 villages, 5 campsites, 2 bedrock mortars, 2 rock shelters, 4 historic sites, and 1 site of unknown description. No sites along this segment are listed on the National Register, however, two villages, one bedrock mortar site, and one historic site are considered eligible for inclusion; other sites require additional evaluation procedures. Thus, a significant impact to cultural resources could occur from pipeline construction.

4.2.11.2 Emidio to Blythe. Ten of the 86 known sites identified with 0.5 mile of the pipeline are located within the ROW of the proposed Celeron/All American pipeline. Two sites within the pipeline route are considered eligible for the National Register and others require additional evaluation procedures. Thus, a significant impact to these sites could occur from pipeline construction.

4.2.11.3 Blythe to McCamey. Thirty-four of the 144 known sites identified for Arizona within 0.5 mile of the Celeron/All American pipeline are located directly within the pipeline ROW. Although some sites have been evaluated others require additional evaluation procedures. One site within the ROW is considered to be eligible for the National Register. Thus, a significant impact to cultural resources could occur from pipeline construction.

Five of the 43 known cultural resource locations identified for the New Mexico segment of the pipeline are located directly within the pipeline ROW. None of the five sites have been determined to be eligible for nomination to the National Register at this time, although further survey and evaluation procedures are necessary. Significant impacts could occur.

In Texas, 5 of the 182 known cultural resource sites are located directly within the pipeline ROW. Only one site along the pipeline ROW (Huero Tanks State Park) is located within a National Register District. Five sites located directly within the proposed ROW are to be evaluated for eligibility. Currently no sites on the route are on the National Register.

4.2.11.4 Summary. In summary, at least 8 cultural resource sites along the Celeron/All American ROW and 4 sites along the Getty ROW are considered by the recorders to be eligible for listing on the National Register. In all states, further survey and evaluation procedures will be conducted prior to construction to determine National Register eligibility and the nature of applicable mitigation measures.

4.2.12 Visual Resources

Visual resources significance criteria based on both Forest Service and BLM impact assessment methodologies are presented below, followed by a discussion of the visual effects for each segment of the Celeron/All American and Getty proposals. Impacts to visual resources caused by individual project facilities would be considered significant if:

- A proposed facility would not meet existing BLM Visual Resource Management Class Objectives or Forest Service Visual Quality Objectives for an area.

Impacts to visual resources caused by the combined effects of the project would be considered significant if:

- The visible area would change in overall character to a more impacted Visual Condition Type than presently exists, as seen from fixed viewpoints, based on BLM and Forest Service objectives, e.g., Existing Visual Condition is Type III and Future Visual Condition is Type IV.

The pipeline ROW would generally not be visually evident to people from nearby highways, roadside rest areas, parks, or recreation areas. Examination of various existing underground pipelines, which the Celeron/All American and Getty proposals would parallel, indicated that they would not be visually evident from nearby travel routes or use areas.

One area of exception to the above generalization is where the Celeron and Getty pipelines would cross the LPNF in Santa Barbara County. Here the ROW clearing would be visually evident from nearby roads and campgrounds. Clearing of mature live oaks and sycamores in La Brea Canyon, plus ROW clearing through uniform brushfields on the Sierra Madre Mountains, would create significant visual impacts. Elsewhere, as the pipelines would cross the LPNF in existing fire breaks, there would not be significant changes from existing to future visual conditions. Both existing and future visual conditions would not generally meet Forest Service visual quality objectives for the affected areas on the LPNF.

Except for those areas in the LPNF and a short segment near Tejon, California, the Celeron/All American pipeline would traverse mainly flat agricultural or desert lands. These areas have been discussed in detail in the Sohio DEIS (BLM 1976, p. 2-675). Where the pipeline traverses gentle slopes (less than 5 percent slope), observation of the pipeline scar would be limited laterally from 0.25 to 0.5 mile. Traversal of steeper slopes (over 5 percent slope) would expose the pipeline scar to potential observation from the surrounding landscape. Portions of Celeron/All American's proposed project involving aboveground facilities, such as pump stations and power line extensions would have greater exposure to observation from the surrounding landscape than the buried pipeline. Based on observations along Celeron/All American's proposed route, impacts from ROW clearing are not expected to be significant.

Tables 4-16 through 4-18 present a visual resources analysis of those impacts that would be created as a result of the construction of the above-ground facilities from California to Texas, and Table 4-19

TABLE 4-16

VISUAL IMPACTS: LAS FLORES TO EMIDIO

Site or Facility	Existing Visual Condition	Future Visual Condition	VQO (Forest Service)	Significant Impact
Celeron: Las Flores Pump Station	II	II	NA[1]	No
Celeron and Getty: Gaviota Pump Station	II	VI	NA	Yes
Celeron: Santa Ynez River Crossing	V	V	NA	No
Getty: Santa Ynez River Crossing	V	V	NA	No
Celeron: Sisquoc Pump Station	II	IV	NA	Yes
Getty: Sisquoc Pump Station	II	II	NA	No
Getty: Cuyama River Crossing	IV	IV	NA	No
Celeron: Cuyama River Crossing	IV	IV	NA	No
Both Getty's and Celeron's Cuyama River Crossings	IV	IV	NA	No
Getty: Cuyama Pump Station	III	IV	NA	Yes
Getty and Celeron: California Aqueduct Crossing	V	V	NA	No
Celeron and Getty: Emidio Delivery Station	VI	VI	NA	No

Source: ACT

[1]Not Applicable

TABLE 4-17

VISUAL IMPACTS: EMIDIO TO BLYTHE

Site or Facility	Existing Visual Condition	Future Visual Condition	VMC (BLM)	Significant Impact
All American: Emidio Heating/ Pumping Station	VI	VI	NA[1]	No
Tejon Pumping Station	II	II	NA	No
Twelve Gauge Lake Pumping Station	IV	V	IV	Yes
Mojave River Crossing	VI	VI	NA	No
Cadiz Tank Farm, Heating/ Pumping Station	IV	VI	III	Yes

Source: ACT

[1]Not Applicable

TABLE 4-18

VISUAL IMPACTS: BLYTHE TO McCAMEY

Site or Facility	Existing Visual Condition	Future Visual Condition	VMC (BLM)	Significant Impact
Colorado River Crossing	V	V	NA[1]	No
La Paz Heating/ Pumping Station	IV	V	III	Yes
Gila River Crossing	V	V	NA	No
Gila Heating/ Pumping Station	IV	IV	IV	No
Coolidge Heating/ Pumping Station	IV	IV	NA	No
Tom Mix Pumping Station	III	IV	NA	Yes
San Pedro River Crossing	III	III	NA	No
Hot Springs Heating/Pumping Station	IV	IV	NA	No
Lordsburg Heating/ Pumping Station	IV	IV	NA	No
Rio Grande River Crossing	V	V	NA	No
Anthony Heating/ Pumping Station	II	II	IV	No
Salt Flats Heating/Pumping Station	IV	IV	NA	No
Delaware River Crossing	IV	IV	NA	No
Pecos River Crossing	V	V	NA	No

Source: ACT

[1]Not Applicable

26—78571

TABLE 4-19

VISUAL IMPACTS

PIPELINE RIGHT-OF-WAY ON LOS PADRES NATIONAL FOREST

Site or Facility	Existing Visual Condition	Future Visual Condition	VQO (Forest Service)	Significant Impact
La Brea Canyon	III	V	Retention	Yes
(Both Celeron/All	IV	IV		Yes
American and Getty proposals)				
Ridgetop between	II	IV	Retention, Partial	Yes
Bear and La Brea	III	V	Retention, Modifi-	Yes
Canyons (Celeron/	IV	V	cation	Yes
	V	V		Yes
All American)	I	IV	Retention, Partial Retention, Modification	Yes
North Fork	III	V	Retention, Partial	Yes
La Brea Creek and	IV	IV	Retention	Yes
Smith Canyon (Getty)	V	V		Yes
Treplett Mountain area (Both Celeron/	V	V	Retention, Partial Retention	Yes
All American and	V	V	Partial Retention	Yes
Getty proposals)	V	V	Partial Retention	Yes
Miranda Pine Mountain area	V	V	Retention	Yes
(Both Celeron/All	II	III	Partial Retention,	Yes
American and Getty proposals)	III	V	Modification, Maximum Modification	Yes

Source: ACT

presents the analysis for the pipeline ROW as it crosses the LPNF in California. Additional detail on visual impacts within the LPNF can be found in Appendix E. Visual resource attributes assessed include Existing Visual Conditions (EVC) of the landscape, the Future Visual Condition (FVC) of the overall landscape after construction, and the Visual Quality Objective (VQO) or Visual Management Class (VMC) where applicable to either Forest Service or BLM standards.

In addition to the pumping/heating/delivery stations displayed in the above tables, visual impacts would also occur due to the extension of overhead electrical service to three pump stations: Sisquoc, Tejon and Cadiz. At each of these sites, slight visual impacts would occur due to the placement of 69 to 115 kV lines on wooden pole "H" frames. The poles would be either light tan or light green in color, depending on the preservative treatment used. The visual impacts of such a utility are generally acceptable unless the area is unroaded/ undeveloped, has high scenic value, or has high visual sensitivity. Given the settings for the proposed transmission lines, significant impacts are not anticipated.

The transmission line serving Sisquoc pump station (Celeron/ All American and Getty) could be located along one of three separate alignments. First, it could follow the pipeline route from Sisquoc pump station to US 101, then follow US 101 and Zaca Canyon Road to the Zaca Substation. Visual sensitivity is high along US 101, and the existing and future visual condition would be a minor visual disturbance (EVC = FVC = III). Second, the transmission line could proceed due west from the Sisquoc pump station along the Cat Canyon route, tying into an existing power line about 4 miles away. The existing and future visual conditions would be minor visual disturbances (EVC = FVC = III). Third, the transmission line could follow the proposed Santa Maria Canyon Alternative from the Cuyama River, approximately 12 miles south and east to the Sisquoc pump station. This connection is the greatest length and traverses woodlands, pastures and agricultural areas. The existing and future visual conditions would remain at minor visual disturbances (EVC = FVC = III). The visual sensitivity is moderate to low along this proposed alignment.

The Tejon pump station (Celeron/All American) would be served by a similar transmission line following the proposed pipeline from Emidio pump station. An area of visual sensitivity is along US 166, where there are existing overhead utility lines. This proposal would not affect the scenic/visual resources viewed from US 166, US 99, or I-5, where intensive agricultural uses and highways predominate the landscape character (EVC = FVC = V).

The Cadiz tank farm (Celeron/All American) would be served by a transmission line starting at Camino Substation near I-40 and following the existing Four Corners Pipeline Corridor to the tank farm site. This line would be about 37 miles long, and would lie entirely within existing utility corridors. The overhead line would be slightly visible from I-40 near Camino, but not visible from I-40 or US 66 for most of its length. The future visual condition would be minor visual disturbance (EVC = FVC = III) in an area of moderate to low scenic quality and low visual sensitivity.

Figures 4-1 through 4-6 are a series of three sets of "Before" and "After" pictures that respectively represent EVCs and a simulation of expected FVCs at three of the most visually sensitive pipeline locations crossing the LPNF (see Map 4-2). Table 4-20 summarizes the visual impacts associated with the above-ground facilities of the Celeron/All American and Getty proposals. As indicated on Tables 4-16 and 4-19, there would be five areas along the Las Flores to Emidio portion of the proposed routes where significant visual impacts would occur. Three would be associated with pump stations and the other two would be the Celeron/All American and Getty routes through the LPNF.

Between Emidio and Blythe (All American), two areas of significant impact were identified, a pump station and the Cadiz tank farm. Two proposed pump stations between Blythe and McCamey were also identified as significant visual impacts. A total of 7 significant impacts were identified for the Celeron/All American proposal and 3 significant impacts for the Getty proposal.

4.2.13 Noise

The impacts discussed for noise are classified as significant or not significant based on the degree of impact as measured against scientific and social (or human) criteria. The criteria that follow are derived from regulatory standards, research information, and/or standards based on best professional judgement of resource specialists. Noise impacts would be considered significant if:

- Adopted state or local standards would be exceeded, or
- Estimated noise emissions would exceed a day-night average sound pressure level (L_{dn}) of 60 dBA at the nearest noise sensitive receptor (California Office of Noise Control).

The more stringent standard was used for evaluation in all states.

4.2.13.1 Las Flores to Emidio

Construction. Noise effects from construction of both the Celeron/All American and Getty pipeline would be a function of the noise generated by construction equipment, the location and sensitivity of nearby land uses, and the timing and duration of the noise generating activities. Construction activities would, of course, occur throughout the length of the pipeline corridor. Machinery employed for a typical spread is itemized in Table 2-7. A typical noise generation profile for pipeline construction activity is illustrated in Appendix F.

The Las Flores to Emidio corridor segment contains numerous land uses that would be classified as noise-sensitive receptors (Table 3-23), including the Vista del Mar school at Gaviota; state parks; residential subdivisions, notably at Buellton; and numerous individual residences scattered along and sometimes adjacent to the proposed ROW corridor. The closest of these to the construction activity would be several residences that are located within 100 to 500 ft of the proposed pipeline, notably at Buellton.

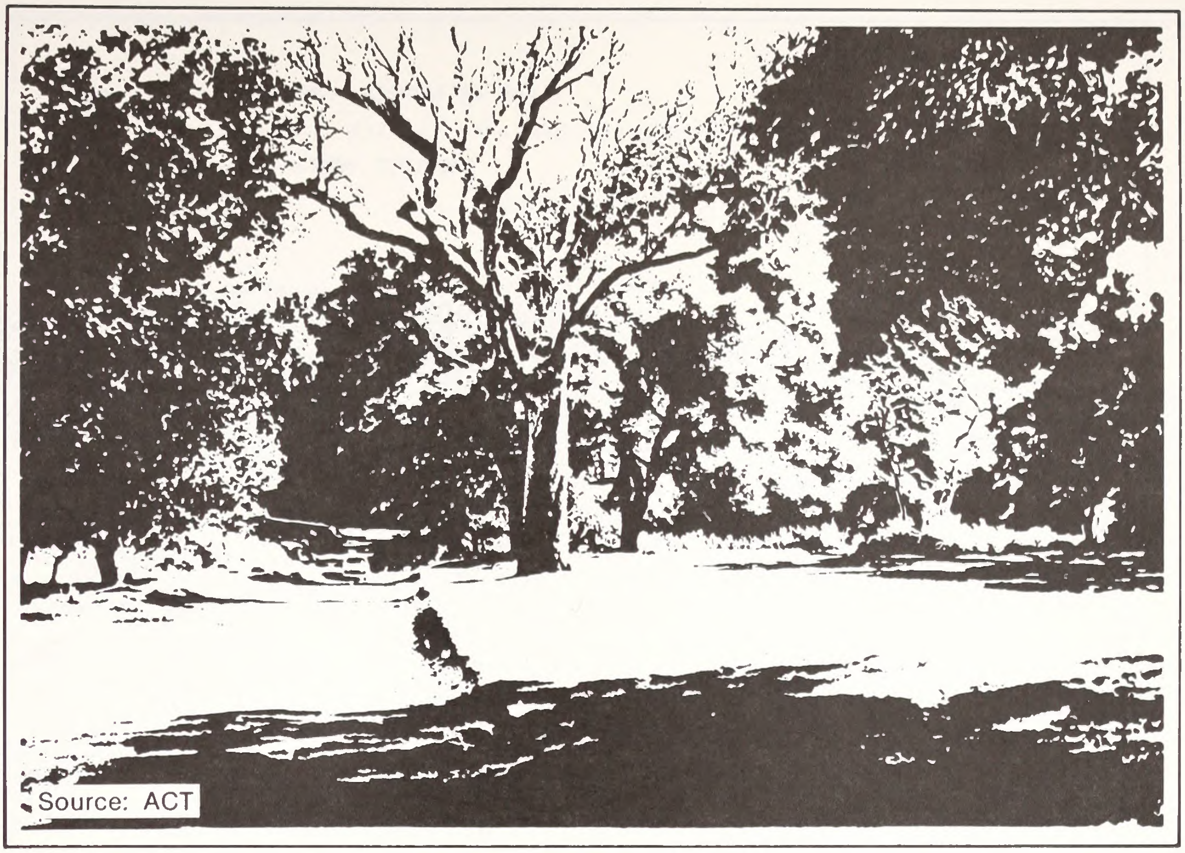


FIGURE 4-1 TYPICAL VIEW FROM LA BREA CANYON ROAD. EVC = III

FIGURE 4-2 PIPELINE THROUGH LA BREA CANYON AS VIEWED FROM LA BREA CANYON ROAD. FVC = V

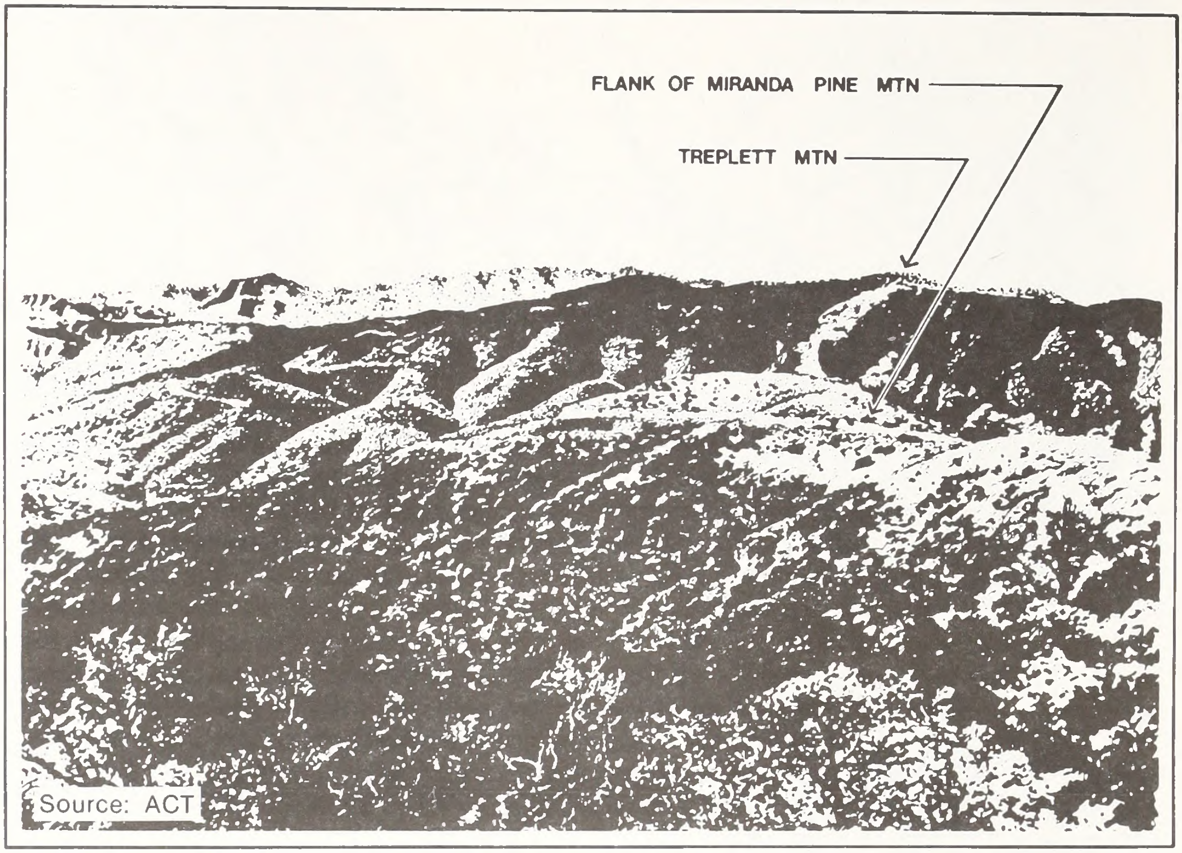


FIGURE 4-3 TREPLETT MOUNTAIN AND MIRANDA PINE MOUNTAIN AS VIEWED FROM SIERRA MADRE ROAD. EVC = V&VI

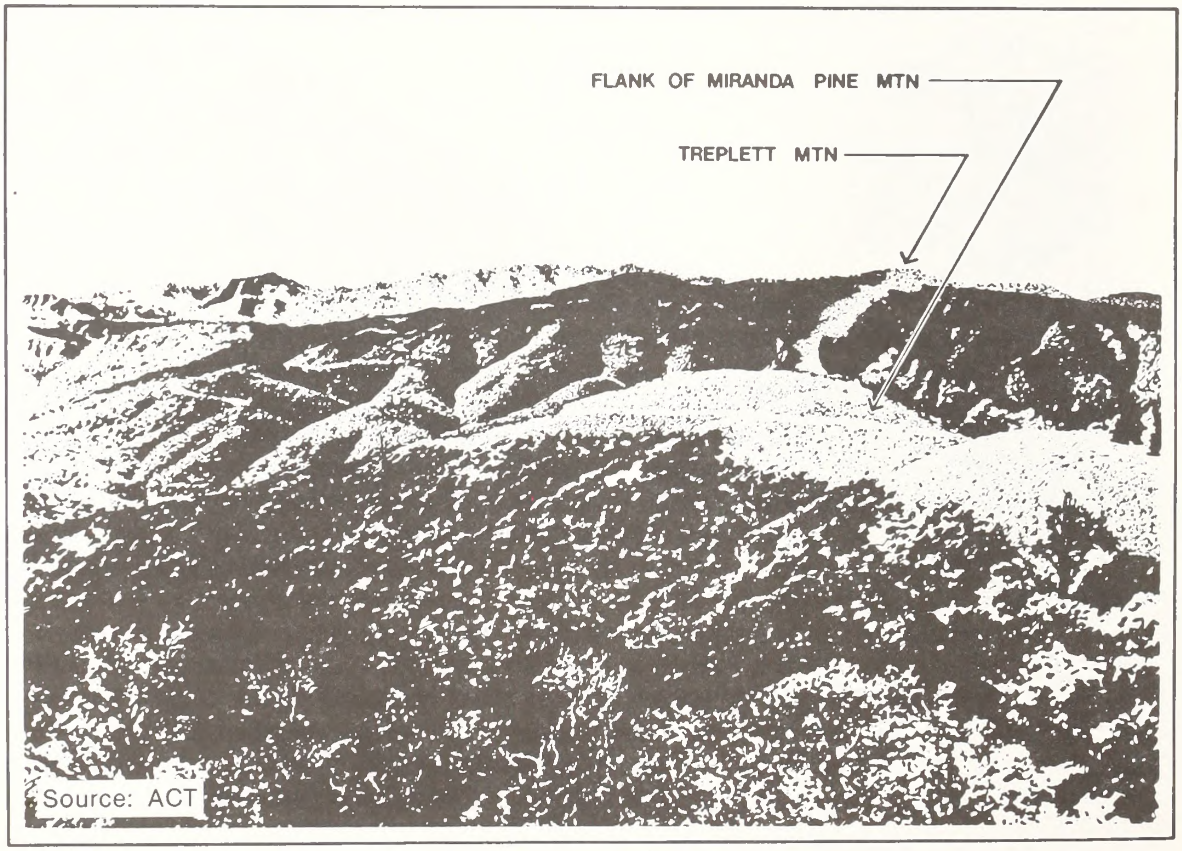


FIGURE 4-4 PIPELINE CROSSING FROM TREPLETT MOUNTAIN TO MIRANDA PINE MOUNTAIN AS VIEWED FROM SIERRA MADRE ROAD. FVC = V&VI

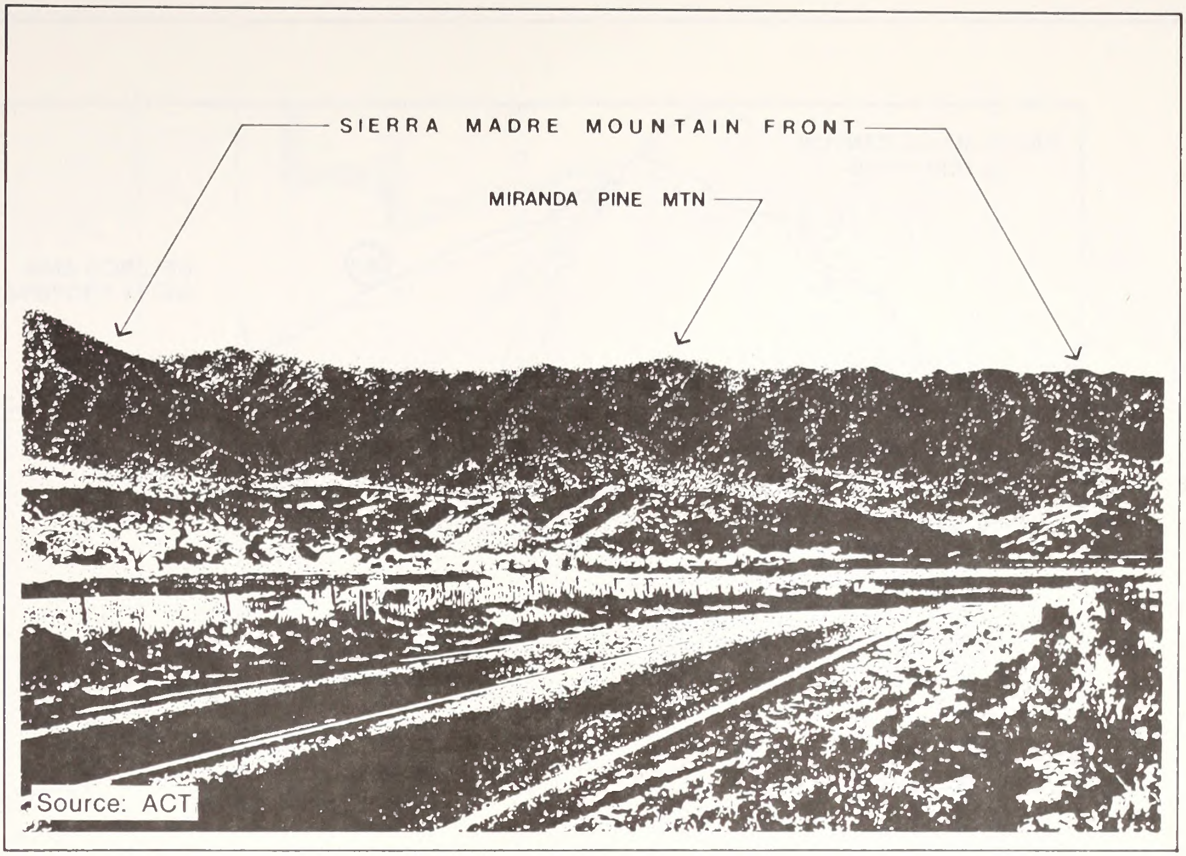


FIGURE 4-5 SIERRA MADRE MOUNTAIN FRONT AND THE CUYAMA VALLEY, AS VIEWED FROM HIGHWAY 166. EVC = I&III

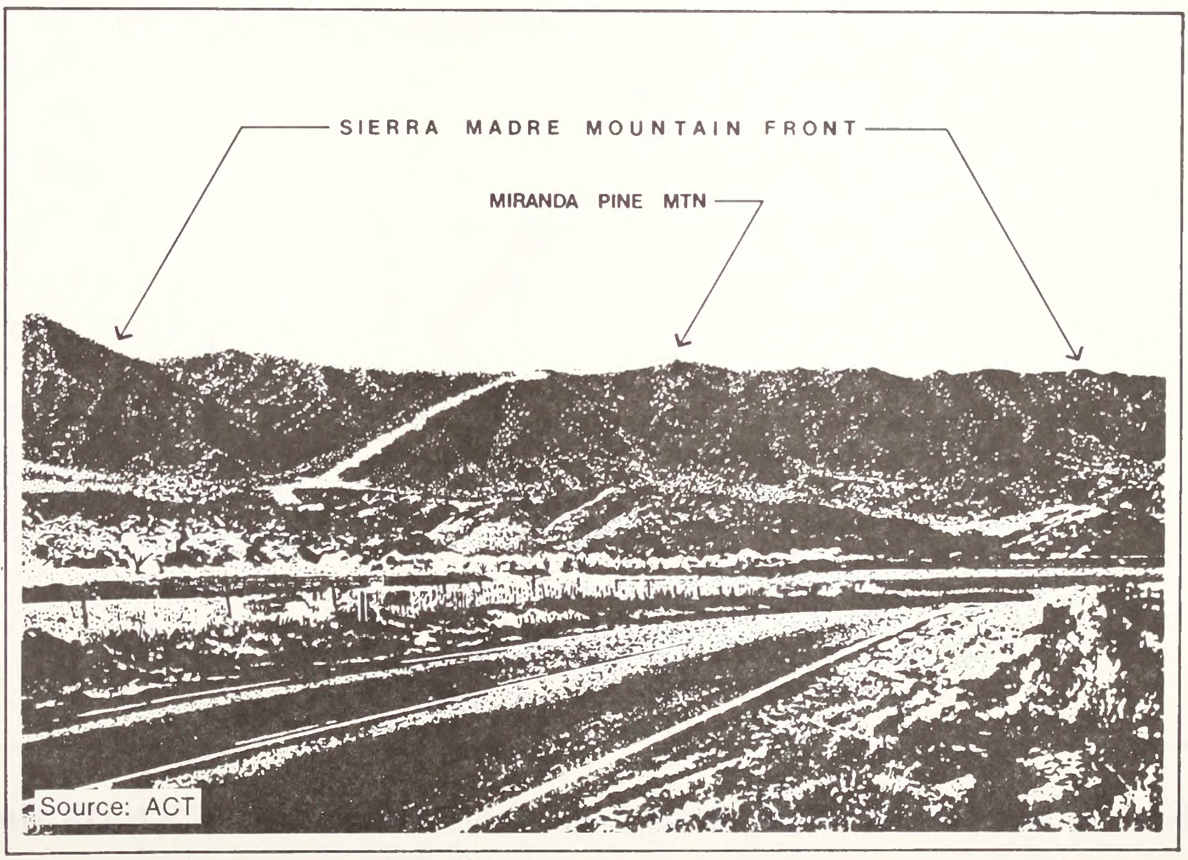
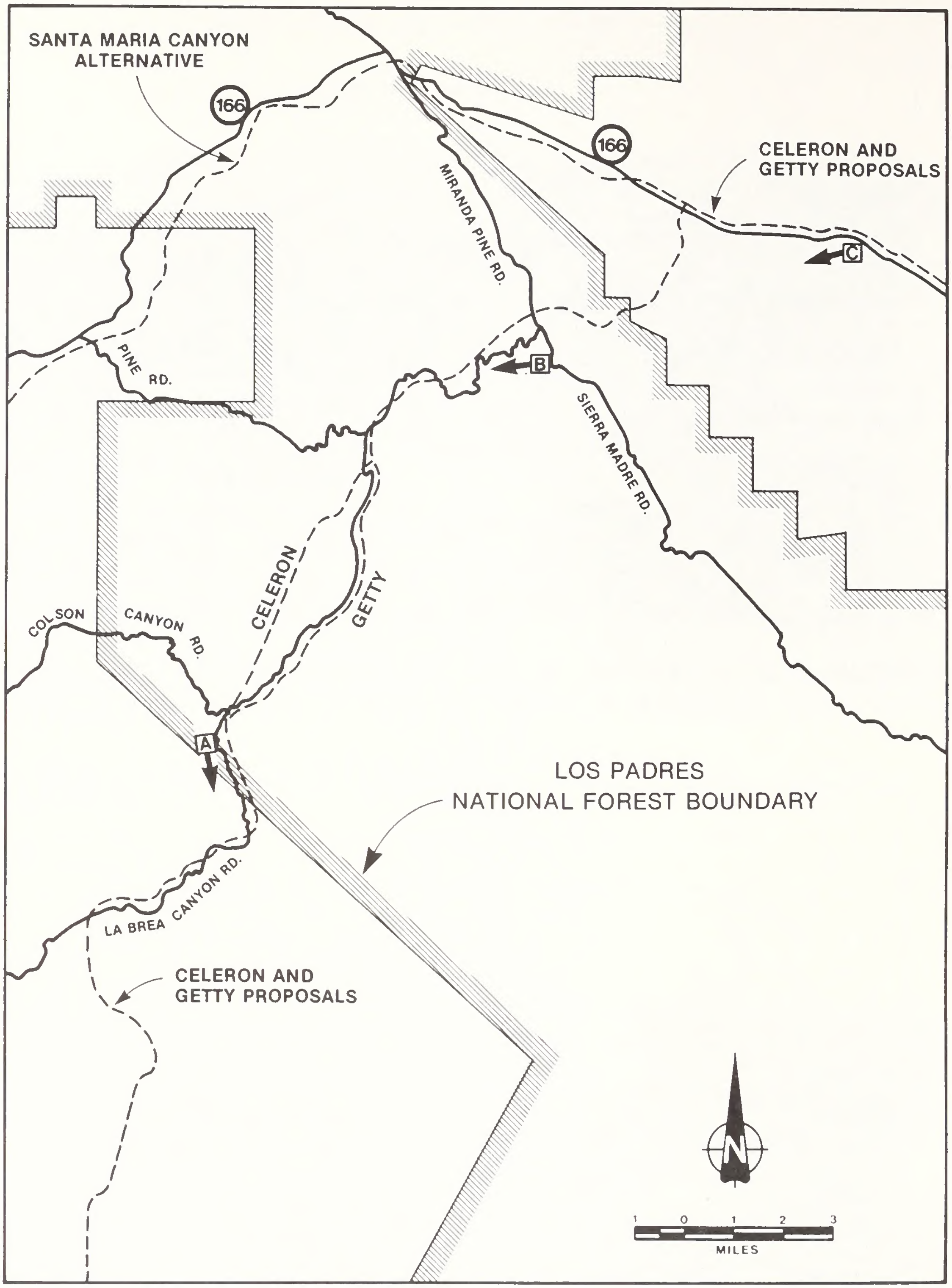


FIGURE 4-6 PIPELINE CROSSING SIERRA MADRE MOUNTAINS FROM MIRANDA PINE MOUNTAIN TO THE CUYAMA VALLEY, AS VIEWED FROM HIGHWAY 166. FVC = I&V



A - View point for figures 4-1 & 4-2
B - View point for figures 4-3 & 4-4
C - View point for figures 4-5 & 4-6

MAP 4-2 VIEW POINTS FOR IMPACT ANALYSIS ON LOS PADRES NATIONAL FOREST

TABLE 4-20

SUMMARY OF VISUAL IMPACTS ASSOCIATED WITH THE CELERON/ALL AMERICAN AND GETTY PIPELINE PROPOSALS

Site or Facility	Magnitude of Effects	Duration of Effects	Significant Impacts	Comments
Heating/Pumping Stations	Low	Long-term	Yes at some sites	Most stations would blend in or meet visual objectives. They would be permanent facilities.
Delivery Stations and Tank Farms (All American only)	High	Long-term	Yes	Most tank farms would be very visually evident, and would be permanent.
River Crossings	Low	Short-term	No	River crossing would be underground, and would be unnoticed after revegetation by fast-growing riparian plants.
Aqueduct Crossing	Low	Long-term	No	Aqueduct crossing above-ground would be evident, but not objectionable.
LPNF: Pipeline Corridors	High	Long-term	Yes	100 ft. wide clearing would almost totally clear the canyon of trees. It would probably take 100± years to re-establish the large tree character which currently exists. Chaparral would become re-established in 5 to 10 years to the extent that visual impacts from ROW clearing would be greatly reduced.

Source: ACT

Applying the construction noise generation profile to the proposed corridor indicates that the nearest homes would be subject to pipeline construction noise levels in excess of 75 dBA. More than 100 homes between Las Flores and Emidio could be subject to construction noise levels of 60 dBA or greater, depending on detailed site conditions. This would be considered a significant impact.

Application of the final considerations of timing and duration, however, greatly reduces the significance of these noise effects on the homes and other sensitive receptors. Pipeline construction activities would take place only during the daytime, not during the more sensitive nighttime hours from 10:00 pm to 7:00 am when background noise is lower and most people sleep. In addition, the entire construction operation, from clearing and grading to cleanup and restoration, would move past a given location on the corridor in less than two weeks time.

Operations. Noise effects from operation of the proposed pipeline would be geographically isolated to the vicinity of the pump and heater stations. Using worst-case terrain assumptions of flat terrain with no barrier effects and no equipment directivity effects, pump station, noise emissions were modeled (see Appendix F). The results for the Las Flores to Emidio corridor segment indicate the only sensitive receptors that could be within a 60 dBA or greater pump station noise contour (and thus significantly impacted) would be the Vista del Mar school near the Gaviota station. Actual noise impact levels would depend on the placement of the pump station on the site and other site design features. A more detailed analysis of the composite noise effects of the proposed pipeline and other petroleum development facilities at Gaviota is included in the Getty Gaviota Consolidated Coastal Facility Draft EIR (ERT 1984). This analysis indicates that, although the noise levels at the school would be approximately 73 dBA, the increment added by the petroleum development activity would be a barely discernable 3 dBA. Most of the noise is already existing due to traffic on US 101. Although the incremental increase in noise caused by the pump station would be small and barely noticeable, it would be considered significant because the ambient conditions already exceed the 60 dBA significance criterion.

4.2.13.2 Emidio to Blythe

Construction. The Emidio to Blythe corridor segment contains numerous noise-sensitive land uses. Most are residences clustered in small communities along the corridor, including the towns of North Edwards, Desert Lake, Boron, Kramer Junction, and the City of Barstow. In addition, the proposed corridor passes near the California State Women's Prison and several unincorporated residential subdivisions and scattered individual residences.

Application of the construction noise generation profile indicates that numerous residences mostly in the communities listed above would be exposed to project-related construction noise levels of 60 to 65 dBA but that only a few would be subject to noise levels exceeding 65 dBA. This would be a significant impact.

The key consideration for construction noise effects along the Emidio to Blythe corridor segment, as for the Las Flores to Emidio segment, is that the noise effects would be short-lived and limited to the daytime hours of 7:00 am to 5:00 pm.

Operations. No noise sensitive land uses have been identified within the 60 dBA noise contour of any of the pump or heater stations along the Emidio to Blythe corridor segment.

4.2.13.3 Blythe to McCamey

Construction. The Blythe to McCamey corridor segment contains relatively few noise sensitive receptors for its more than 700-mile length. The key considerations are residential communities both incorporated and unincorporated. There are very few scattered individual residences near this segment of the corridor. The full list of identified sensitive receptors is included in Table 3-26. The most notable among them are residential developments in Pinal County, Arizona; the communities of Lordsburg and Deming, New Mexico; and the communities of Wink, Monahans, Crane, and McCamey, Texas, all of which have residential land uses very near the proposed pipeline corridor.

Application of the construction noise generation profile indicates that several residences are near enough to the proposed corridor that project-related construction noise could exceed 75 dBA during peak periods. Numerous other residences would fall inside the 60 dBA construction noise contour. This would be a significant impact. The Maricopa Indian Reservation would be the closest reservation to the proposed pipeline route (approximately 1 mile) and would not be subjected to significant noise levels because the 60 dBA noise contour extends only about 2,500 ft from the ROW.

As for the corridor segments discussed previously, a key consideration is that high project-related noise levels at sensitive receptors would be short-lived and limited to daytime hours (7:00 am to 5:00 pm).

Operations. No noise-sensitive land uses have been identified within the 60 dBA noise contour of any of the proposed pump or pump/heater stations along the Blythe to McCamey corridor segment.

4.2.13.4 Summary. Noise levels from construction activities would exceed the 60 dBA significance threshold at several residential locations along all three segments of the proposed pipeline corridor. The impacts would be limited to the daytime hours and would last for less than two weeks. It is assumed that proper mufflers would be used on all construction equipment and OSHA standards would be adhered to for the protection of workers. This combination would minimize the construction noise impacts to the degree possible considering the short duration of the adverse impacts plus the difficulty and low likelihood of success of further reducing noise emissions from transient construction activities. Noise levels from operation of the proposed pipeline would not exceed significance thresholds at any identified sensitive receptor except the Vista del Mar School near the Gaviota pump station.

4.2.14 System Safety and Reliability

The system safety and reliability analysis of potential adverse impacts from the Celeron/All American and Getty proposals is based upon a review of design specifications and project construction and operations procedures. These documents were reviewed relative to compliance with pertinent regulations and industry standards. The following significance criteria for impact analysis are based on accepted industry practice in the design and operation of hydrocarbon processing and transportation facilities. Any one of the following conditions would result in a significanct adverse impact.

- Non-compliance with any applicable design code or regulation.
- Non-conformance to National Fire Protection Association (NFPA) standards at any location.
- Inadequate pressure relief and disposal system design criteria.
- Operating policies concerning security, leak detection, spill containment, or fire protection that do not conform to generally accepted industry practices.

There are three phases a project goes through between its conception and operation. These phases along with major tasks within each phase are shown below. As can be seen the Celeron/All American and Getty proposals are in Phase II which means final engineering design has not started. This fact requires that many items discussed in the system safety section be reviewed only in a general manner. Resulting mitigation measures may actually represent measures which would be covered in the final design when it is completed.

Phase I - Preliminary Design and Permit Application Preparation

- Select the pipeline route
- Develop a preliminary cost estimate based on preliminary project design
- Prepare project proposal documents for public agencies

Phase II - Permit Processing

- File for applicable permits
- Prepare EIR/EIS

Phase III - Final Design and Construction

- Once permits are forthcoming, begin detailed engineering by all disciplines

- Obtain ROW and/or ROW options
- Complete final design
- Review final design
- Receive final construction permits
- Construct pipeline, pump stations, and tank farm
- Review and inspect construction

The following discussions are by project component, facility, or procedure. Table 4-21 lists all the codes and standards applicable to the projects and notes if Celeron/All American and Getty would conform to the code or standard. After evaluation of each project application's specific components, facility, or procedure for these proposed plans, a conclusion is presented relative to potential impacts.

4.2.14.1 Pipeline and Tank Farm Design with Applicable Codes and Standards. Table 4-21 provides the principal facilities involved in the proposed pipeline projects and the codes and standards to which those facilities would be designed and constructed. Many important standards and specifications not listed are incorporated into the listed codes by reference. Getty and Celeron/All American have indicated that all applicable codes, standards, and regulations would be followed. The following discussions briefly summarize the analyses and rational for the presence or absence of impacts.

Seismic Design Criteria. Pipeline loads resulting from seismic activity fall into three categories:

- Loads resulting from ground acceleration and consequent response spectra of the pipeline
- Differential motion at surface faults
- A combination of the two categories above

Getty and Celeron/All American plan to evaluate every active fault to determine the effects of seismic activity on the pipeline (also refer to Section 4.2.2). Specific designs would then be developed to accommodate the expected effects of seismic activity. The designs would conform to the applicable stress criteria of American National Standards Institute (ANSI) B31.4. Design criteria would include, but not be limited to, internal design pressure, surge pressure, test pressure, vacuum, fluid inertia loads, temperature, external pressure (including overburden), and differential movement due to surface fault displacement, local liquefaction, or other loss of support.

There is a possibility that during the design process the projected seismic activity of a fault would be so large that there is no reasonable design solution. If this problem develops, the applicants have proposed to install control measures such as block and/or check

Table 4-21

APPLICABLE CODES AND STANDARDS

	ANSI B31.3	ANSI B31.4	API 650	API 1104	API 6D	NFPA 30	NEC	EARTH QUAKE DESIGN	49 CFR 195	UBC FOR ZONE	ANSI A58.1	AISC
Pipeline		C,A,G		C,A,G				C,A,G	C,A,G			
Pipeline Valves					C,A,G							
Pipeline Valve Locations		C,A,G							C,A,G			
Hydrostatic Testing		C,A,G							C,A,G			
Pumps									C,A,G			
Pump Station Piping		C,A,G		C,A,G								
Pump Station Valves					C,A,G							
Tank Farm Piping		A		A								
Tank Farm Valves					A							
Tank Farm Layout		A				A						
Pump Station Layout		C,A,G				C,A,G	C,A,G					
Storage Tanks		A	A			A		A				
Corrosion		C,A,G							C,A,G			
Pressure Relief		C,A,G							C,A,G			
Cathodic Protection		C,A,G							C,A,G			
Security		C,A,G							C,A,G			
Heaters	A									A	A	A
Scraper Launch & Rec.		C,A,G							C,A,G	C,A,G		
Structures & Buildings								C,A,G		C,A,G	C,A,G	C,A,G

Index to Table

C- Celeron Pipeline Company of California
A- All American Pipeline Company
G- Getty Trading and Transportation Company

Codes and Standards where only All American complies do not apply to Celeron or Getty due to their not having a tank farm or heaters.

American National Standards Institute (ANSI) B31.3 Petroleum Refinery Piping

Prescribes minimum requirements for materials, design, fabrication, assembly, test and inspection of petroleum refinery pressure and vacuum systems. Covers all piping within the property limits of a refinery, loading terminal, bulk plant, compounding plant or refinery tank farm.

ANSI B31.4 Liquid Petroleum Transportation Piping System

Prescribes minimum requirements for piping transporting liquid petroleum such as crude oil, condensate, natural gasoline, natural gas liquids, and liquid petroleum products between producers lease facilities, tank farms, gas processing plants, refineries, stations, terminals and other delivery and receiving points.

Table 4-21 (Continued)

American Petroleum Institute (API) 650 Welded Steel Tanks for Oil Storage

Specification covers material, design, fabrication, erection and testing requirements for vertical cylindrical above-ground, closed and open-top, welded steel storage tanks, for internal pressures approximating atmospheric. Appendix E of the code provides detailed procedures for designing for earthquake effects.

API 1104 Standard for Welding Pipelines and Related Facilities

Covers welding of piping used in compression, pumping and transmission of crude petroleum, petroleum products and fuel gases, and to applicable distribution systems. Also details qualification, testing and inspection of piping welds, including radiographic procedures.

API 6D Specification for Pipeline Valves

Specification covers material, design, fabrication, assembly and testing requirements for valves intended for service in petroleum, petroleum product, and natural gas pipelines.

National Fire Protection Association (NFPA) 30 Flammable & Combustible Liquids Code

Prescribes minimum standards of design and operation of equipment and facilities employed in the storage, handling and processing of flammable and combustible liquids.

Title 49, Code of Federal Regulations (49CFR) Transportation

The governing Code for the U.S. Department of Transportation, parent organization of the Office of Pipeline Safety. Parts 192 and 195 of the regulation relate to gas and oil piping respectively, and outline the minimum requirements for, materials, design, fabrication, assembly, construction, operation, inspection, testing and maintenance of pipelines transporting or storing hazardous gases and/or petroleum and allied products.

Uniform Building Codes (UBC) (Intern'l. Conf. of the Bldg. Offices)

Sets forth minimum standards for materials, design and construction of buildings and appurtenant structures. Has no intrinsic authority, but is generally incorporated into local building regulations which do have force of law. Section 73 prescribes procedures for wind and earthquake design.

ANSI A58.1 Minimum Design Loads for Buildings and other Structures

Similar to Section 23 of the Uniform Building Code, but provides more detailed procedures for wind and snow load design. Earthquake design procedures are virtually identical to UBC.

American Institute of Steel Construction (AISC)

The AISC publishes a number of specifications and recommended practices, the most notable of which are:

- Specification for the Design, Fabrication and Erection of Structural Steel for Buildings
- AISC Code of Standard Practice
- Specification for Structural Points Using ASTM A325 or A490 Bolts

These specifications are updated at regular intervals and are frequently incorporated into law by reference. AISC standards have been accepted as definitive by the steel industry and the engineering profession for many years.

Earthquake Design

This column is intended to show the intent of Getty, Celeron, and All American to evaluate every active fault crossing. This evaluation would be used in designing for the motions, forces, and resultant stresses generated by predicted fault activity along the pipeline right of way.

valves to minimize the volume of oil spilled from a failure. No violations of codes or standards were noted.

Corrosion Design Criteria and Corrosion Control Procedures. Protection of a pipeline from corrosion is of critical importance to the environment as well as the pipeline operator. Pitting of the pipeline can occur due to chemical reaction between the soil and the carbon steel pipe if it is not adequately protected. This pitting would eventually reduce the strength of the pipe sufficiently to cause a break and allow an oil leak. Therefore, Getty and Celeron/All American intend to wrap the pipelines in accordance with applicable regulations. Additionally, cathodic protection would be installed as required within 12 months of the pipeline installation dependent upon soil and chemical conditions. Corrosion control test stations would be installed with which to test the integrity of the corrosion protection. This is all in accordance with 49CFR-195.

Due to the low inlet concentrations of H_2S (less than 15 ppm) and water allowed by the pipeline companies, internal corrosion is not anticipated to be a problem. During final design, detailed metallurgical studies would be conducted to confirm initial conclusions.

Pressure Relief and Relief Liquid Disposal System. Emergency shutdowns, valve closures, and other phenomena can cause the pressure in the pipeline to suddenly increase. This pressure must be relieved or the pipe could potentially burst. ANSI B31.4 guides the design of pressure relief systems. All applicants have incorporated pressure relief provisions into their respective pipelines as follows:

- Getty - pressure relief valves and disposal system at their terminus in the San Joaquin Valley.

- Celeron/All American - pressure relief valves and above-ground relief tanks at stations where elevation differences dictate (such as Emidio) as well as additional pressure relief devices and tankage as required at Cadiz, California and Wink, Texas.

On the basis of available information, the preliminary design appears adequate. Details and exact locations would be worked out during the final design phase of the project.

Control Logic and Soundness of Design for Leak Detection System. Getty and Celeron/All American have proposed to use a leak detection system using the volume balance method in conjunction with a mathematical pipeline model. This is a widely used and accepted method for leak detection in pipelines. Careful consideration must be given by all three companies to the setting of pipeline condition monitoring frequency and the short and long-term volume balance calculation periods. The short-term period is used to detect large leaks and the long-term period is used to detect small leaks. The response to the leak detection system is addressed in Section 4.2.15.

The supervisory control systems proposed, of which the leak detection system is a part, would have totally redundant computers and peripheral equipment and would be equipped with uninterruptible power supplies. Additionally, all of the remote terminal units would be equipped with stand-by power. The proposed systems are considered to be state of the art for the petroleum industry.

Fire Control System. Getty and Celeron/All American have proposed fire control systems for the pump stations that are consistent with unmanned pump stations throughout the oil industry (see Appendix I for additional detail). The systems consist of fire extinguishers and heat sensors (fire detectors). The fire extinguishers would be available for use if company staff are in the station during the fire. The heat sensors would activate the automatic shutdown system for the pump station and alarm system. After the pump station is shut down, pipeline personnel would be required to travel to the station and investigate the situation before it can be restarted, since the design requires that restart from a shut-in condition can only be performed at the station.

The storage facility at Cadiz would have no fire protection system in addition to the equipment provided with the adjacent pump station (see Appendix I for additional detail). Floating roof oil storage tanks designed, installed, and maintained in conformance with Chapter 2 of NFPA 30 do not require fire protection. NFPA 30, Flammable and Combustible Liquids Codes, does require that the distance between the proposed storage tanks and the property line which is or can be built upon, be at least 175 ft. The proposed spacing is approximately 115 ft. Due to the small potential that anything else would ever be built at Cadiz, the apparent non-compliance with the code would not be considered significant.

All of the pipeline alignments and pump station locations have been selected to minimize impacts on human receptors. Pump stations to be installed at Emidio and Wink, while located near existing oil-related facilities, would be sited to conform with separation requirements of NFPA 30. The ROW is located sufficient distance from sensitive existing facilities such as schools, hospitals, and densely populated areas as to provide no significant impact during construction or operation.

Oil Spill Control Systems. Each applicant has included a series of block and check valves for control of the loss of oil in the event of a leak or rupture. Automated block valves are included at each pump station and at the Cadiz tank farm. Getty has also proposed automated block valves upstream (relative to oil side flow) of sensitive stream crossings and a check valve on the downstream side. Celeron/All American has a similar system and includes automatic block valves at sensitive locations. Current industry technology and standards are proposed by the Applicants.

4.2.14.2 Operating Procedures

Security Policies. The security systems proposed by Getty for their pump stations and pipeline block valves are as follows:

- 6-ft chain link fences topped with anticlimb barbed wire.

- Gates would be locked when station is unattended.

- A perimeter alarm system would be installed around pump stations which would sound a local alarm and an alert to the dispatcher. The dispatcher would then notify local law enforcement officers and company personnel.

- If access to the pump station is by private road, the gates at the road entrance would be locked at all times.

- The pipeline block valves would be padlocked independently of the fence gate lock.

Security for the pipeline itself would be provided by aerial reconnaissance at intervals not exceeding two weeks. This is in accordance with Section 451.5(a) of ANSI B31.4 to which the pipeline is constructed. Ground reconnaissance would be used by Celeron/All American to supplement the aerial reconnaissance only if the aerial reconnaissance indicates a need for it. The proposed security measures are typical for modern pipelines. Getty has increased it surveillance and included two aerial surveys per week plus one ground reconnaissance per year which is more intensive than DOT regulation and at the top of industry standards.

The security policies proposed by Celeron/All American for their pump stations are the same as for Getty. Pipeline block valves would be protected by a two-rail fence constructed of 2-inch pipe and would be padlocked. Policies proposed for the oil storage facility at Cadiz are the same as for pump stations.

<u>Leak Detection Staff Procedures</u>. Getty has proposed a detailed set of procedures to be followed in the event of a detected leak. These procedures define exactly who would be contacted and when. Different responses are designated for different potential events. The procedures provide clear responsibilities and lines of authority for the leak response team. These procedures are consistent with those used throughout the oil industry and appear to be adequate for handling any spills that may occur.

The Celeron/All American proposed procedures, although not as detailed, cover the same topics. Both projects are designed to be in accordance with EPA Regulation, Title 40, Article 112.

<u>Fire Protection Staff Training and Procedures</u>. Getty and Celeron/All American have all proposed fire protection staff training and procedures which are consistent with those typically used throughout the oil industry. Training would consist of classroom training on the extinguishment of fires with emphasis on oil fires. Hands-on training would also be given in the use of extinguishers and fire-fighting equipment. Management personnel would attend oil fire-fighting school at either the Western Oil and Gas Association school in Reno, Nevada or the Texas A&M school in College Station (Bryan), Texas. Historically, the training received at oil fire fighting schools have been a key

element in the operation of a safe petroleum facility. Coordination procedures would also be developed, as per state law, between the local fire departments and the pipeline companies.

4.2.14.2 Summary. The review of the safety aspects of the proposed Celeron/All American and Getty applications indicates that the intent of the applicants is to build projects which comply with all applicable codes, regulations, standards, and generally accepted industry practices. For this stage of design plans, the applications are in compliance with codes, regulations, and industry standards.

4.2.15 Oil Spill Potential and Effects

The purpose of this assessment is to describe the risks and consequences of possible oil spills associated with the proposed projects. Quantification of these risks and impacts requires: 1) estimates of the probability of an accident leading to an oil spill and possible spill magnitudes; 2) a description of exposure of potentially sensitive target areas to spilled oil; and 3) an assessment of the adequacy of proposed oil spill countermeasures to minimize the likelihood or severity of a spill, and emergency contingency plans to mitigate the impacts of a spill.

The major assumptions that underlie the oil spill risk analysis include the following:

- Past accident frequencies can be used to predict future accident frequencies.
- Accidents are statistically independent and random and are sufficiently uncommon (especially major spills) that their probabilities may be described through a statistical relationship called a Poisson distribution.
- Although it is not feasible to assess the risks of all foreseeable types and circumstances of oil spill incidents, the ranges of possible impacts can be estimated from analysis of selected individual oil spill scenarios.

The impacts discussed for oil spill potential are classified as significant or not significant based on the degree of impact to sensitive resources. The criteria that follow are derived from regulatory standards, research information, and/or the best professional judgement of resource specialists.

- Oil spills are considered significant for any pipeline rupture or for any leak greater than 5 barrels.
- During construction, any spills of fuels or lubricating oils into an active water course would be considered significant.

4.2.15.1 Historical Data. The available historical data for pipeline oil spills have been analyzed by various investigators in terms of different "exposure variables". In the present context, an "exposure variable" is a measureable (or countable) physical quantity which bears some direct and preferably simple connection to the production or transportation of oil, and which can be related to the statistical probability of an oil spill. The exposure variables most commonly used to describe the risk of an oil spill from pipeline operations are:

- volume of oil handled, e.g., the probability of a spill is described in terms of number of spills per billion barrels provided or handled; and

- miles of pipeline operational per year, e.g., the probability of a pipeline spill is described in terms of number of spills per mile of pipeline operating per year.

Different investigators have emphasized one or another of these exposure variables according to the information they now have or expect to have available for risk prediction. In the discussion below, historical accident statistics are presented using several exposure variables. Where possible, specific information about the Celeron/All American and Getty projects are utilized in estimating spill probabilities (i.e., pipeline mile length and age). Based on the conclusions of OIW (1978), this study selected pipeline mileage as the best exposure variable. This variable allows an evaluation of all the available data for risk estimation.

4.2.15.2 Pipeline Statistics. Table 4-22 shows the cause of U.S. pipeline accidents over the 5-year period from 1971 to 1975 (U.S. EPA 1982a). As shown, pipeline faults, including defective pipe and corrosion, accounted for 56 percent of the spills and 53 percent of the volume spilled. Internal corrosion is the largest cause of a spill due to pipeline fault and this is more characteristics of older pipelines which were constructed of different materials and did not have the cathodic protection systems proposed by Celeron/All American and Getty. However, the spill size associated with corrosion is substantially smaller than a spill resulting from seam failure, the second largest source of pipeline fault spills. In the category of impact damage, equipment impact is the largest cause of spills. The largest volume of oil spilled is also attributed to equipment impacts. The pipeline would be marked to DOT standards and with the state-of-the-art leak detection systems and automated block valves, damage from spills should be minimized.

Researchers for the Las Flores Marine Terminal Design Project found that the historical rate of oil spills from onshore pipelines has been estimated by numerous studies using pipeline mile-years as an exposure variable. The Oceanographic Institute of Washington (OIW 1978) calculated spill rates based on U.S. Coast Guard Pollution Incident Reporting System (USCG PIRS) data for the period 1973-1977. During this period, 1,580 spills >2.4 barrels (100 gallons) in size were recorded for a cumulative total of 728,000 mile-years of pipeline. The inferred rate of spillage is 2.2×10^{-3} spills >2.4 barrels per pipeline mile-year. The size distribution of oil spills stemming from accidents

TABLE 4-22

CAUSES OF PIPELINE OIL SPILLS BASED ON HISTORICAL U.S. STATISTICS[1]

Cause	Percent of Spills	Percent Volume Spilled
Defective Pipe		
Seam Failure	12	25
Weld Failure	4	6
Other	1	4
Corrosion		
Internal	31	12
External	8	6
Impact Damage		
Equipment Impact[2]	31[2]	26[2]
Excavation Equipment	3	7
Non-Impact Damage		
Natural Causes[3]	4	7
Flow Control Error	2	3
Other Failure	1	3
Other	3	1
TOTAL	100	100

[1]Source: U.S. EPA 1982a

[2]This includes data for all pipelines, and equipment impact includes anchor dragging.

[3]"Natural causes" classification would include damage from earthquake. Only 4 percent of spills occur from natural causes, which would include landslides, flood, etc., which may have been triggered by earthquake. Data summaries by U.S. EPA (1982a) do not specifically break out earthquake related spills into a separate category.

to onshore pipelines has been evaluated by OIW and is shown in Table 4-23. It must be noted that these figures are based on a U.S. pipeline nationwide average diameter of 10 inches.

TABLE 4-23

LAND PIPELINE SPILL SIZE DISTRIBUTIONS

Spill Magnitude (barrels)	Number	Percent of Total Number	Volume (barrels)	Percent of Total Volume
2.4-10	582	36.8	3,682	1.0
11-100	754	47.7	30,298	8.2
101-1,000	198	12.5	63,562	17.3
1,001-10,000	41	2.6	147,541	40.1
10,001-100,000	5	0.3	123,091	33.4
TOTAL	1,580	100.0	368,174	100.0

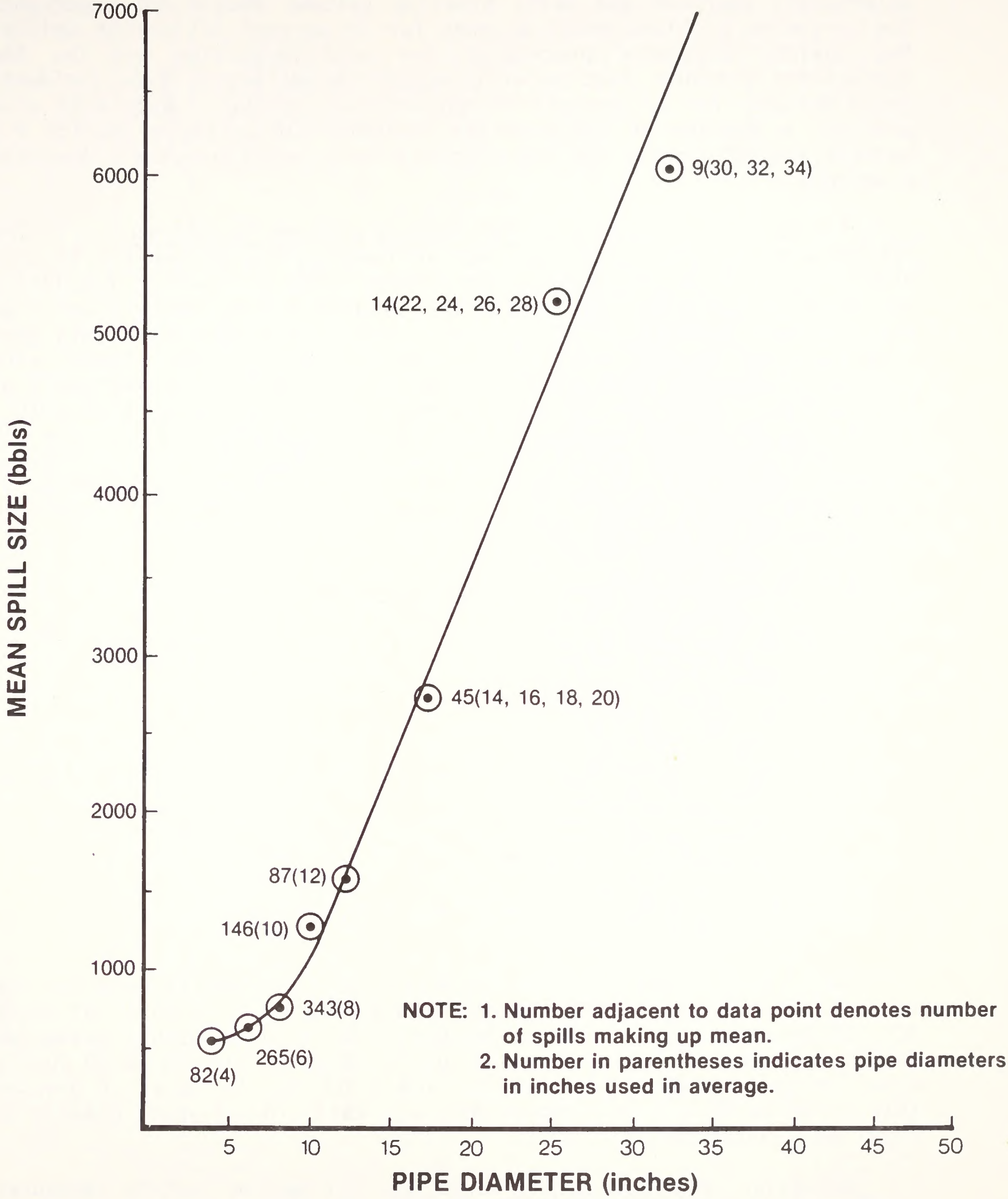
Source: U.S. Coast Guard Pollution Incident Reporting System (OIW 1978).

Note: Includes only spills or 2.4 barrels or more between 1973 and 1977.

U.S. EPA (1982a) reports the historical oil spill rate for pipelines as 1.3 x 10^{-3} spills per mile-year. This spill rate refers to a "reference pipeline" that is 10 inches in diameter and 25 years old. The reference line is buried 3 feet deep and has corrosion protection.

Pipeline spill rates are known to vary as a function of age and size. Figure 4-7 shows the mean spill size and line diameter for pipeline accidents reported to the Office of Pipeline Safety and Operations (OPSO) 1971-1975. For 30 to 34-inch pipelines the mean spill size is around 6,000 barrels. Mastandrea (1983) determined potential spill predictions specifically for the proposed Getty pipeline. Specifications in the Non Destructive Evaluation model included diameter, length, throughput, age, elevation, pressure, pump shutdown time, valve spacing and closure times, and spill prevention and countermeasures.

Since the Getty pipeline would be a new line and would be inspected prior to initial use, it is expected that the incidents of spills exceeding 50 barrels would be 0.04 spills per year or considerably below the national average of 0.2 spills per year (1.76 x 10^{-3} spills/mile-year). However, spill frequency is expected to reach the nationwide average in about 30 years with an annual incidence of spills of 0.2 per year (1.6 x 10^{-3} spills/mile-year) along the 113 miles of pipeline



Source: Mastandrea 1982

FIGURE 4-7 MEAN SPILL SIZE AND PIPE DIAMETER FOR ACCIDENTS REPORTED TO OPSO, 1971-1975

(Mastandrea 1982). Mastandrea's analysis is very conservative when the new pipeline design systems and materials are considered. The Celeron/All American and Getty pipeline systems should not experience the corrosion problems which account for 39 percent of current spills. The quality assurance procedures for weld inspection and for the hydrostatic pressure testing will reduce the defective pipe incidents which account for 16 percent of the current spills. Table 4-24 also provides a summary of the expected incidence of spills exceeding 9.5 barrels and 50 barrels for the proposed Getty and Celeron/All American pipelines.

4.2.15.3 Statistics for Onshore Storage Facilities. The researchers for the Las Flores Marine Terminal Design Project found a historical rate of oil spills from onshore crude oil storage facilities has been estimated by OIW (1978) using storage volume (barrel-years) as the exposure variable. The rate is based on the USCG PIRS data base covering the period 1973-1976. During this period, there were 176 spills reported and a cumulative total of 6.98×10^8 barrel-years of oil stored. This yields an average rate of about 2.52×10^{-7} spills/barrel-year of storage. The rate applies to spills >2.4 barrels in size. A spill size frequency distribution of onshore storage facility spills was developed by OIW (1978) based on 176 incidents in the USCG PIRS data base. The fraction of spills exceeding a specific volume is shown below.

Volume Distribution on Onshore Storage

Facility Spills[1] Spill Volume in Barrels	Fraction of Spills in this Size Class[2]
$\geq$10	0.642
$\geq$100	0.148
$\geq$1,000	0.011
$\geq$10,000	0

[1]Estimates based on Table IV-2 of OIW 1978

[2]Fractions apply to the class of spills >2.4 barrels in size

Table 4-25 summarizes the estimated spill volume frequencies for Celeron/All American's proposed Cadiz tank farm which consists of three 500,000 barrel tanks. Over the 30-year life of the project, estimated spills include 11.4 spills equal or greater than 10 barrels, 2.58 spills equal or greater than 100 barrels, and 0.225 spills equal or greater than 1,000 barrels (i.e., approximately 1 spill in 133 years greater or equal to 1,000 barrels).

4.2.15.4 Pipeline Spill Prevention. Pipeline safety measures proposed by Getty and Celeron/All American include both leak avoidance and leak detection measures. Leak avoidance measures include careful material and system design, adequate depth of burial, hydrostatic pressure testing, corrosion prevention and inspection, and block valve systems. Complete descriptions of proposed spill prevention measures and maintenance procedures are presented in Section 2.2.

TABLE 4-24

CURRENT AND FUTURE PROBABILITIES OF SPILLS USED AS A BASIS FOR AN "OVER LIFE OF PROJECT" ASSESSMENT

Assumptions	Celeron Segment	Getty[1]	All American Segment
Diameter	30-inch	20- to 30-inch	30-inch
Volume	300,000 BPD	400,000 BPD	300,000 BPD
Length	122 miles	113 miles	1,084 miles
Pipeline Life	30-40 years	30-40 years	30-40 years
Spill Incidents[2] (New pipeline 1984)			
Spills greater than 50 bbl			
- Overall length of pipeline	0.04	0.04	0.325
- Each mile	0.0003	0.0003	0.0003
Spills greater than 9.5 bbl			
- Overall length of pipeline	0.08	0.08	0.758
- Each mile	0.0007	0.0007	0.0007
Spill Incidents (Pipeline 20 years old)			
Spills greater than 50 bbl			
- Overall length of pipeline	0.11	0.11	0.97
- Each mile	0.0009	0.0009	0.0009
Spills greater than 9.5 bbl			
- Overall length of pipeline	0.22	0.22	1.95
- Each mile	0.0018	0.0018	0.0018

TABLE 4-24 (CONTINUED)

Assumptions	Celeron	Getty[1]	All American
Spill Incidents (Pipeline 40 years old)			
Spills greater than 50 bbl			
- Overall length of pipeline	0.27	0.27	2.49
- Each mile	0.0023	0.0023	0.0023
Spills greater than 9.5 bbl			
- Overall length of pipeline	0.54	0.54	4.87
- Each mile	0.0045	0.0045	0.0045

NOTES:

[1]Calculated specifically for the Getty pipeline by Mastandrea 1983; assumed 30 inch pipeline, 120 miles long.

[2]Other spill rates reported in the literature include:

Probability	Source
0.0022 spills/pipeline mile-year	OIW 1978; USCG PIRS data 1973-1977, spill greater than 2.4 bbl; all pipeline sizes and ages
0.0013 spills/pipeline mile-year	U.S. EPA 1982a; 10-inch diameter pipeline 25 years old
0.00176 spills/pipeline mile-year	National average - reported by Mastandrea 1983

TABLE 4-25

CURRENT AND FUTURE PROBABILITIES OF TANK FARM SPILLS

Spill Volume (bbls)	Spills/Barrel Year of Storage	1,500,000 bbl (3 tanks)/Barrel Year of Storage	Spills Over Life of Project (30 years)
≥10	2.52×10^{-7}	3.8×10^{-1}	11.4
≥100	5.7×10^{-8}	8.6×10^{-2}	2.58
≥1,000	4.9×10^{-9}	7.5×10^{-3}	0.225
≥10,000	0	0	0

Source: OIW (1978)

The pipe would be 0.344 to 0.562-inch wall thickness for Celeron/All American and 0.5-inch wall thickness for Getty. The pipe would be buried a minimum of 3 ft deep and its location would be marked by signs to DOT standards. All stream crossings would be analyzed for 100-year scour depth and the pipeline would be buried 4 ft below that depth. In bedrock the pipe would be buried to a depth of 18 inches. A concrete coating would also be applied at underwater crossings and a double casing used at road crossings.

Before burial, the welds would be subjected to nondestructive tests including radiography (x-ray), magnetic particle inspection, and dye penetrant or ultrasonic tests. A minimum of 10 percent of the welds made by each welder each day would be radiographically inspected. Hydrostatic testing of the pipeline would be completed at a pressure 1.25 times (or greater) than the maximum operating pressures.

The corrosion protection system includes special pipe coating on the exterior and a cathodic protection system. The pipeline coating would be tested before burial. The cathodic protection system would be inspected and maintained at 6-month intervals.

Block valve and check valve systems would be installed at sensitive water crossings to minimize oil losses into streams should the pipeline fail or be damaged (see individual resource sections for discussions of oil spill impacts).

4.2.15.5 <u>Oil Spill Contingency and Cleanup Plans</u>. Despite the engineering design, specifications, and safeguards built into a pipeline system, the potential for oil spills still exist and additional containment and cleanup measures must be addressed. The conceptual oil spill contingency plans reviewed for Getty and Celeron/All American incorporate procedures for responding to an oil spill. These procedures begin with personnel training, an established communications network, standard reporting system, and defined responsibilities and lines of authority.

Appendix H of this EIS/EIR contains a preliminary draft of the applicants' oil spill contingency plan. The preliminary draft oil spill contingency plan incorporates much of the general information found in the applicants' conceptual plans. However, information that should be incorporated (by the applicants) into the final plan when final project design is complete, has been specifically identified. For example, the applicants have identified appropriate general containment and cleanup procedures (which are summarized below) but have not yet developed specific procedures for sensitive areas along the pipeline route. When final design is complete, the applicants will be required to develop specific procedures.

The actual containment and cleanup procedures adopted, after a leak has been detected and located, depend on whether the spill is in a confined (populated) or unconfined (rural) area. The first priority in a confined area is to ensure human safety, followed by appropriate containment and cleanup procedures. Containment and cleanup procedures utilized would depend on the size of the spill and surrounding terrain (flat terrain, steep slopes, depressions, streams or rivers, etc.).

On flat terrain, where oil would spread in all directions, dams or berms would be constructed around the perimeter of the spill. In steeper areas where the oil may spread by following natural drainages or water ways, the following techniques would be used to contain and divert oil:

- blocking dams
- underflow dams
- diversion dams
- overflow berms
- culvert blocking

Cleanup procedures would generally require removal of soil or other natural substrates that become contaminated with oil. The motor grader/ elevating scraper technique would be used for cleanup of relatively flat areas except where trees or heavy vegetation creates difficulties. Steep slopes or uneven terrain often require a bulldozer or front-end loader for sediment removal. Excessively steep or rough terrain may be cleaned using low pressure water flushing. This technique can also be used to remove oil from vegetation. On disturbed areas, reseeding and/or replasting would be undertaken as necessary to control erosion and return the area to a stable condition.

Oil which has formed pools in natural depressions or containment areas can be picked up with vacuum trucks. In less accessible areas, portable pumps discharging into barrels can be used. Sorbents may be used to remove small pools of oil, to clean light accumulations of oil from impervious surfaces, or to complete clean up. There are two techniques involving pumping that apply to oil spill cleanup of groundwater: water flooding (floation) and pumping oily water to the surface.

4.2.15.6 Federal and State Oil Spill Response Teams. In addition to individual operator contingency plans, Federal and state contingency plans and oil spill response teams are also in effect. These governmental levels of response and their relationship to Getty and All American/Celeron contingency plans in the event of a major spill incident is described below. The conceptual contingency plans clearly address the responsibilities, interaction, and lines of communications between the applicants response teams and Federal and State response teams (Getty 1983c).

Federal Response. A Federal response is comprised of several different levels of repsonse. These are the National Response Team, National Strike Force, the Regional Response Teams and at the local level, the designated On-Scene Coordinator (OSC).

The Department of Transportation, U.S. Coast Guard, is responsible for the protection of coastal waters, the Great Lakes, and for ports and harbors. As such, the U.S. Coast Guard has established strike forces and Regional Response Teams to provide this protection. The southern California coastal area is the jurisdiction of the Pacific Strike Team, based in San Francisco. Within 2 hours of notification, the Pacific Strike Team can provide at least four trained personnel to the spill site at the request of the OSC, the Coast Guard or the commanding officer of the Strike Team.

The governing contingency plan for the southern California coastal region is the Region IX Multi-Agency Oil and Hazardous Materials Pollution Contingency Plan, subregional Plan for Zone One, Southern California. Zone One is contained within the jurisdiction of the 11th Coast Guard District, the commander of which serves as the OSC for all spills and is the key Federal official onsite. The Regional Response Team is under the direction of the OSC and is composed of the following knowledgeable agency officials: The Director of Surveillance and Analysis Division of the Regional Environmental Protection Agency, Commander of the U.S. Western Air Force Reserve Region; Director of the California Office of Emergency Services; and representatives from the U.S. Corps of Engineers, the 11th Naval District, 6th U.S. Army Headquarters, U.S. Fish and Wildlife Service, and Regional oil and Gas Division of the U.S. Geological Survey.

The onshore and inland spills are under the jurisdiction of the U.S. Regional EPA. Title 40, Part 112 requires a Spill Prevention and Control and Countermeasure Plan be submitted to EPA within six months after the facility begins operation. In the Plan the OSC coordinator and supporting agencies are identified for each segment of the pipeline.

In responding to a spill incident, the OSC will encourage the responsible parties to take the initiative in correcting the problem if they are able; if they are not, the OSC will activate the Regional Response Team, Pacific Strike Team and State Response Teams, as necessary. The OSC is responsible for the adquacy of the spill response operation and will maintain surveillance over operations until completed satisfactorily. For onshore and inland spills, the cleanup is supervised by the OSC but may be executed by a private contractor.

State Response. The State of California Oil Spill Contingency Plan provides for a coordinated response of State agencies to an oil spill. The plan designates a State Operating Authority (SOA) who will represent the state on the Federal Regional Response Team and have the authority to declare an oil spill emergency requiring the activation of the State Contingency Plan. A representative of the California Department of Fish and Game has been designated as the current SOA.

The State's organizational framework for response to a major spill is multi-level. A State Support Team consisting of various State Department directors will authorize the SOA and administer a standing State Inter-agency Oil Spill Committee (SIOSC). The SIOSC functions as a liaison with public and private oil pollution control organization, reviews the State Contingency Plan, and recommends research and development. The SIOSC does not, however, have any direct-line authority during an oil spill. The SOA appoints a State Agency Coordinator who will be in charge of all state agencies engaged in combating a pollution incident. These agencies comprise the State Operating Team. The State Agency Coordinator will also act in a capacity similar to that of the Federal OSC.

4.2.15.7 Potential Oil Spill Effects. The proposed Celeron/All American and Getty pipelines would cross a variety of ecosystems between the California coast and Texas. Along the route numerous resources are considered at risk from potential oil spill. Table 4-26 summarizes areas along the pipeline route identified by resource specialists as being sensitive to an oil spill event. Based on the locations of these sensitive areas, maximum spill size volumes were estimated for each area. Factors such as elevation, location of check valves, and system shut-off response time were considered, if available, to calculate spill volumes. The automatic shutdown system would generally reduce the amount of the spill by two to three times. Potential impacts of spills at these sensitive areas are addressed in the individual resource sections of this document. When final project design is completed, the applicants will be required to develop specific contingency and cleanup plans for these sensitive areas.

Probably the best documented case of an inland pipeline oil spill involved a pipeline rupture near Glenrock, Wyoming on April 8, 1980 (U.S. EPA 1982b). The ruptured pipeline was owned by Platte Pipe Line Company. An estimated 8,552 barrels of crude oil escaped into the North Platte River and contaminated approximately 60 miles of river from the spill site downstream to Glendo Reservoir. The North Platte River oil spill site is located in east-central Wyoming, approximately 15 miles east of Casper, Wyoming. The following is a summary of the damage caused, effectiveness of oil spill contingencies utilized, and the recovery observed.

Flow in the river at the time of the spill was 13,000 cubic feet per second (cfs), but was intentionally reduced at an upstream reservoir to 400 cfs to slow the downstream movement of oil until containment areas could be established. Flow was then gradually increased and beached oil was refloated to downstream containment areas. A total of 11 boom deployment/oil recovery points were established. At each site, 6-inch diameter polyurethane pipe was deployed at a severe angle to the current. The pipes diverted significant amounts of oil to the shore for vacuum truck recovery. By April 20, most of the recoverable oil had been removed from the river. According to Platte Pipe Line Company, of

TABLE 4-26

ESTIMATES OF POTENTIAL SPILL VOLUMES AT SENSITIVE OR POTENTIALLY HAZARDOUS AREAS ALONG THE PIPELINE ROUTE

	Celeron/All American (Automatic Shutdown)		Getty (Automatic Shutdown)	
	(bbl)	(gal)	(bbl)	(gal)
Refugio Creek	1,753	73,626	NA[1]	NA
Gaviota Creek	1,753	73,626	1,162	48,804
South Branch Santa Ynez Fault[2]	6,157	258,594	4,934	207,228
Santa Ynez River	3,244	136,248	2,240	94,080
Sisquoc River	2,620	110,040	3,120	131,040
La Brea Creek	1,753	73,626	2,023	84,966
Cuyama River	2,192	92,064	2,120	89,040
San Luis Obispo/Kern County Line[2]	8,370	351,540	3,160	132,720
San Andreas Fault	4,635	194,670	2,200	92,400
Garlock Fault[2]	5,465	229,530	NA	NA
Mojave River	3,945	165,690	NA	NA
Colorado River	3,506	147,252	NA	NA
Gila River	4,383	184,086	NA	NA
Wild Cat Canyon Creek	1,981	83,202	NA	NA
Bass Canyon Creek	3,068	128,856	NA	NA
Rio Grande River	2,629	110,418	NA	NA
Pecos River	4,821	202,482	NA	NA

Source: Celeron/All American, and Getty

[1]Not Applicable.

[2]No valves at the crossing location.

the 8,552 barrels of oil released, approximately 6,500 barrels were recovered. The remainder evaporated or was dispersed into the environment.

The most damaging effects from this oil spill were short term and affected benthic invertebrates and terrestrial wildlife. Macroinvertebrates were almost completely destroyed and some 355 birds (mainly mallards and mergansers) and 33 mammals (primarily beaver, muskrat, and mule deer) died as a result of the spill. The invertebrates had completely recovered at most sampling and monitoring sites several months after the spill. No fish mortality was noted although disagreeable odors and taste occurred in some game fish species for about 2 months after the spill. Oil concentrations on the river surface exceeded the State limit of 10 milligrams/liter (mg/l) immediately after the spill (2.8 mg/l to 8,195.0 mg/l), but were below 10 mg/l within 7 days after the spill. Dissolved and/or emulsified oil in the water column never exceeded 10 mg/l.

Surveys of groundwater were conducted at 16 wells along the river system. The filtering action of sands and gravel was low and allowed oil inflow into some shallow wells (4 total) particularly the dissolved fraction. The contaminated wells were within 45 ft of the river bank, however, contamination was evident for only 24 hours. There was some oiling of the river sediment above background level (April 16) primarily near the river banks. As the river flow increased much of the oil was probably washed from the sediments. A direct correlation was found in the laboratory between water temperature and dissolved/emulsified oil.

Long-term effects of the spill included a slightly depressed muskrat population and Canada goose reproduction effort. Many nests of Canada geese were oiled, as were the eggs in all of the oiled nests. The result may have been smaller than normal brood sizes for this species in 1981.

The EPA damage assessment study demonstrated that though short-term impacts from a massive oil spill into an inland waterway can be severe, the ecosystem is resilient and can recover when aided by rapid and effective cleanup efforts. Of course, the severity and duration of the spill impacts would also depend on the nature of the spilled product and the environmental conditions prevalent at the time of the spill (e.g., temperature, river flow, etc.). Tradeoffs must often be made: in this case, when a reduction was made in the river flow rate to aid effectiveness of the oil spill booms, oil was deposited onto sediments near the river banks.

4.2.15.8 Summary. Assuming a 40-year project life, it is unlikely that any spills would occur for the 113-mile Getty and 122-mile Celeron pipeline segements. However, for the 1,084-mile All American segment, 4.87 spills greater than 9.5 barrels and 2.49 spills greater than 50 barrels have been projected. Any spills greater than 5 barrels would be considered significant; however, the duration and magnitude of impact and resources at risk would be dependent upon the locations of spill incidents, volumes spilled, and application of oil spill contingency measures.

Maximum possible spill volumes at stream or river crossings (given a pipeline rupture) would have significant impacts on environmental resources, but these impacts may be of short duration.

Tank farm spills greater than 100 barrels but less than 1,000 barrels would be likely to occur over an assumed 30-year life of project. However, these spills are unlikely to pose a risk to the environment due to containment within the diked and bermed tank farm area.

4.3 Santa Maria Canyon Alternative

4.3.1 Air Quality

Impacts to air quality would be the same as described for the Celeron/All American and Getty proposals.

4.3.2 Geology

The only potentially significant geologic hazards which may affect the Santa Maria Canyon Alternative route involve slope stability, and seismicity and faulting (see Table 4-4). As shown on Map 1-2, this route traverses areas characterized by existing slope failures or susceptible to new failures. The route crosses the Rinconada and south Cuyama faults of Quaternary age. On the basis of presently available information (Dibblee 1984, personal communication; ESA photointerpretation; Livingston and Associates, Moore and Taber 1979), the probability of surface rupture on these faults during the project life is judged very low.

The discussion of seismicity in section 4.2.2.1 is directly applicable to this alternative.

No other significant impacts or geologic hazards which could lead to an oil spill and consequent impacts have been identified for this alternative.

4.3.3 Soils

Impacts to soils would be similar to those discussed in Section 4.2.3.1. Short-term impacts would include accelerated soil erosion and deposition, decreased productivity from compaction, and increased soil slumping potential. Sensitive soil units along this alternative route are shown on Map 1-2 and are described in Table 4-5.

4.3.4 Surface Water

The Santa Maria Canyon Alternative would cross Tepusquet Creek and parallel the creek along a ridge on its north side. Impacts to Tepusquet Creek would include short-term sedimentation and potential oil spills. No municipal water supplies are near the proposed crossing. The likelihood of channel changes affecting the flow regime of Tepusquet Creek would be small. Impacts for crossing the Sisquoc and Cuyama Rivers would be the same as those discussed for the Celeron/All American and Getty proposals.

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4.3.5 Groundwater

The Santa Maria Canyon Alternative would cross Tepusquet Creek near the mouth of Tepusquet Canyon. Tepusquet Canyon is not listed as a sensitive groundwater area (see Table 3-14) because of limited aquifer extent and low degree of groundwater usage down gradient from the pipeline crossing. The sensitive area of the Sisquoc River would be increased from 1.5 miles (Getty and Celeron proposals) to 2 miles for the Santa Maria Canyon Alternative to account for crossing Tepusquet Creek near its confluence with the Sisquoc River.

Approximately 7 miles of pipeline would be added to western Cuyama Valley in the Santa Maria Canyon Alternative. This change in alignment would not be significant because the western part of the Cuyama Valley is cut into bedrock and is not an aquifer.

4.3.6 Aquatic Biology

Impacts on aquatic resources in Tepusquet Creek would be similar to those described for the Getty and Celeron proposals. Since no important fish species occur in Tepusquet Creek, impacts would not be significant.

4.3.7 Terrestrial Biology

Impacts to vegetation and wildlife along this alternative route would be similar to those described for the Celeron/All American and Getty proposals (see Table 2-9). Loss of wildlife habitat and individual small mammals would be short term and would not affect local or regional populations. Losses of vegetative productivity would be short term (less than five years) for all communities except the riparian and oak woodlands.

About 126 acres of oak woodland, mixed with chaparral primarily in Suey Canyon, would be removed by clearing for pipeline construction. Assuming natural regeneration would allow oaks to become established on the ROW, up to 70 years would be necessary for oaks to reach similar size and density (G. Smith 1984, personal communication). Loss of the oak woodlands is considered a long-term impact.

About 19 acres of riparian woodlands would be removed by pipeline construction. Loss of any riparian vegetation would be considered significant because this community is scarce in California. Most of the affected riparian vegetation occurs along Tepusquet Creek. The Santa Maria Canyon route has good access and room for construction to avoid riparian vegetation and mature live oaks. The Sisquoc River crossing is devoid of riparian vegetation, and construction would not have a significant impact on terrestrial resources.

Pipeline construction would temporarily impact a small area (about 5 percent) of the key turkey habitat slated for turkey reintroductions; impacts would not be expected to be significant. If construction occurred during the nesting season for prairie falcons and golden eagles, human presence could cause nest abandonment and reproductive failure for birds nesting on cliff faces near the route. This would be considered a significant impact.

4.3.8 Socioeconomics

The impacts resulting from the Santa Maria Canyon Alternative would include an increase in the tax base of Santa Barbara and San Luis Obispo Counties. Table 4-27 shows the estimated valuation of the line, 1982 assessed valuation, and the percent increase. This does not represent a significant impact. No additional socioeconomic impacts would result from this alternative.

4.3.9 Land Use and Recreation

Agricultural and residential land uses along this alternative route, concentrated in Tepusquet Canyon, (see Table 3-23) would not be significantly impacted. Beyond Tepusquet Canyon the route passes through open space land and a 4.5-mile section of the LPNF. There are no sensitive land uses along this segment. Recreation use of the corridor is minimal and the routing avoids any FPAs. Future utilities could be accommodated within the cleared ROW through the use of special construction techniques.

4.3.10 Transportation

From a transportation analysis standpoint, the impacts of this alternative would be the same as those previously described for the Celeron/All American and Getty proposals. This alternative would cross the same federal and state highways as the Proposed Project and would be accessed in the same manner.

4.3.11 Cultural Resources

Three of the 14 sites identified within 0.5 mile of the Santa Maria Canyon Alternative route are located within the pipeline ROW. No sites along this route are listed on the National Register of Historic Places. However, further evaluation of some cultural resources is necessary to determine their significance. Thus, significant impacts to cultural resources could occur from pipeline construction.

4.3.12 Visual Resources

A visual resources analysis of those impacts that would result from the construction of a pipeline along the Santa Maria Canyon Alternative is presented below. The pipeline would be located on the ridge west of Tepusquet Canyon and would not be visible from Tepusquet Canyon Road. Where the pipeline crosses grassland and oak woodland, it would generally not be visible following construction and restoration. However, where chaparral is removed for pipeline construction, a scar would be visible until shrubs reinvade the ROW. The visual impacts associated with the pipeline as it crosses the LPNF (see Table 4-19) would be of high magnitude, long-term, and significant. Additional detail on impacts expected within the Forest is contained in Appendix E.

4.3.13 Noise

Noise impacts would be similar to those discussed for the Celeron/All American and Getty proposals. A few residences near Tepusquet Creek

TABLE 4-27

PIPELINE CONTRIBUTIONS TO TAX BASE

County	Miles	Estimated Valuation of Pipeline and Facilities (thousands $)	1982 Assessed Valuation (thousands $)	Pipeline % of Total Countywide Assessed Valuation	1982 Countywide Tax Receipts (thousands $)
Santa Maria Canyon Alternative (Getty)					
Santa Barbara	38.5	25,373	8,958,231	0.28	97,853
Desert Plan Utility Corridor Alternative					
San Bernardino	112	71,344	19,950,620	0.04	242,312
Riverside	79	38,826	18,567,137	0.02	217,465
Brenda Alternative					
La Paz/Yuma	63	11,447	259,329 (primary) 284,180 (secondary)	4.4 (primary) 4.0 (secondary)	4,028

Source: ERT

Site	Existing Visual Condition	Future Visual Condition	VQO (FS)	Significant Impact
On ridgetop and midslopes east of Cuyama River	I	III	Partial Retention	Yes
	I	V	Partial Retention	Yes
	III	III	Partial Retention	No
	III	V	Partial Retention	Yes
	V	V	Modification	Yes
At Highway 166	V	V	Retention	No
	VI	VI	Retention	No
Crossing western tip of Sierra Madre Mountain	I	V	Partial Retention, Retention	Yes
Crossing Sierra Madre Road	V	V	Retention	Yes
Cuyama River Crossing (outside LPNF)	III	III	NA[1]	No

[1]Not Applicable

and the Cuyama River would be subjected to elevated noise levels during pipeline construction. This would be a short-term significant impact.

4.3.14 Oil Spill Potential and Effects

This alternative would not change the expected incidence of spills from the Celeron/All American and Getty proposals (Section 4.2.15).

4.4 Desert Plan Utility Corridor Alternative

4.4.1 Air Quality

Emissions and air quality impacts resulting from operation of the Essex pump station would be the same as described for the Cadiz tank farm in Section 4.2.1.2 (also see Air Quality Appendix A, Table A-11). The maximum 24-hour TSP concentration is estimated to be 4.2 $\mu g/m^3$ at the Joshua Tree National Monument which is the nearest Class I area (located approximately 1 mile from the pipeline). The maximum 3-hour SO_2 concentration is 2.1 $\mu g/m^3$ at the nearest point of the national monument. Thus, no significant impacts are expected in the Class I area.

4.4.2 Geology

The discussion of impacts and geologic hazards in Section 4.2.2.2 is applicable to the this alternative route. In regard to the known mineral resources and possible future mineral development discussed in Section 3.4.2, implementation of local re-routing or re-design would allow access to federally-controlled resources.

4.4.3 Soils

Impacts to soils would be comparable to those described for the Mojave Desert in Section 4.2.3. Major impacts would include accelerated soil erosion and deposition, and decreased productivity from compaction. Sensitive soil units along this alternative pipeline are shown on Map 1-2 and outlined in Table 4-5.

4.4.4 Surface Water

Impacts to surface water would be the same as described for the Celeron/All American proposal. No other major water courses would be crossed by this alternative. No additional surface water impacts would be expected.

4.4.5 Groundwater

This alternative would not be significant in terms of groundwater impacts because of large depths to groundwater, poor water quality, and very limited groundwater development in these basins. Impacts would be similar to those described for the Celeron/All American proposal.

4.4.6 Aquatic Biology

Impacts to aquatic resources in the intermittent streams crossed by the Desert Plan Utility Corridor Alternative would be similar to those described in the Celeron/All American Proposal. Because no important fish species occur in these streams, impacts would not be significant.

4.4.7 Terrestrial Biology

Impacts along this alternative route would be very similar to those described for the Celeron/All American proposal. Both routes follow the desert floor along existing corridors and have similar resources. Primary impacts include removal of creosote scrub communities (2,350 acres), potential disturbance to nesting raptors, and direct or indirect loss of individual desert tortoise. This alternative would also remove 100-ft sections of ironwood and paloverde in desert washes.

Significant impacts to desert bighorn sheep would be considered unlikely since they use habitats in mountainous areas at higher elevations than those potentially affected by the pipeline. Although the route would cross historical migration routes for bighorn, these routes are very large and are used only when bighorn are forced to move to new areas as a result of environmental stress (e.g., drought, overpopulation). Given the short period of time necessary for construction through these areas (less than a month), it is unlikely migrating bighorn sheep would be encountered. Many of these corridors already contain existing paved roads and human activity which present more of a barrier to sheep movement than short-term pipeline construction (Foreman 1984, personal communication).

The Desert Plan Alternative could impact a population of California ditaxis (a federal candidate species) in the Ford Dry Lake area. These areas, because of their small size, could easily be avoided by centerline adjustments. The Chuckwalla Valley Dune Thicket ACEC is on the south side of I-10 near Desert Center and could be impacted. This is very important habitat for mule deer and resident breeding birds.

4.4.8 Socioeconomics

The impacts resulting from the Desert Plan Alternative would include an increase in the tax base of San Bernardino and Riverside Counties. Table 4-27 shows the estimated valuation of 191 miles of pipeline, one electric pump station with heater, one delivery station, and one tank farm; 1982 assessed valuation, and the percent increase. This does not represent a significant impact.

Housing impacts for this alternative are similar to the proposed route for the first half of the pipeline construction. The second half of the pipeline is within close proximity of I-10 and within commuting distance of several service communities.

4.4.9 Land Use and Recreation

This alternative would generally avoid irrigated cropland and residential areas. Potential conflicts with these sensitive land uses are minimal, except in the Blythe area where irrigated cropland and scattered rural residences are located. Urban growth patterns would not be permanently altered. No developed recreation facilities or unique recreation resources would be affected by the alignment.

The proposed ROW is within a utility corridor designated by the BLM in their Desert Conservation Area Plan. This corridor is also consistent with the San Bernardino County Joint Utilities Management Plan and utility corridors identified in the Riverside County Comprehensive Plan.

Approximately 2.3 miles of the Coxcomb Mountains BLM WSA would be crossed by this alternative. There is an existing electric transmission line parallel to the proposed pipeline ROW that delineates the BLM utility corridor. The major effect of a pipeline on the WSA would be from construction of a new access roadway. See Appendix D for a detailed description of potential effects on the WSA. Current BLM management policy does not permit establishment of a new ROW in a WSA, therefore, it is considered a significant impact.

Near Granite Pass the ROW passes adjacent to a BLM ACEC known as Patton's Camp. If structures were avoided, the ROW should not present significant adverse effects. The proposed ROW would cross the corner of the Alligator Rock ACEC near Desert Center (see Map D-2). This areas' unique archaeological resources would not be disturbed by the project.

The Chuckwalla Valley Dune Thicket ACEC is located about 10 miles west of Blythe to the south of I-10. This area, as described in Section 4.4.7, will not be significantly affected by the proposed ROW.

4.4.10 Transportation

The Desert Plan Alternative would parallel existing pipelines and electric transmission lines. This alternative would cross the same federal and state highways as the proposed pipeline, except that I-10 would be crossed an additional time to the west of Blythe, California. The impacts to transportation would be the same as the Celeron/All American proposal except for this additional crossing of I-10.

4.4.11 Cultural Resources

Three of the 21 sites identified along the Desert Plan Utility Corridor alternative route are located within the pipeline ROW. One historic site has been nominated to the National Register with final determination still pending. Two other sites within the pipeline ROW are considered to be eligible for inclusion. Since the sites mentioned above are currently considered eligible for the National Register, disturbance by pipeline construction would represent a significant impact to cultural resources.

4.4.12 Visual Resources

A visual resources analysis of those impacts that would result from the construction of a pipeline along the Desert Plan Alternative are summarized below. Impacts of a transmission line to the Essex Tank Farm would be the same as those discussed for the proposed tank farm (the same route would be utilized) and would not be significant.

Site or Facility	Existing Visual Condition	Future Visual Condition	VMC(BLM)	Significant Impact
Essex Tank Farm and Heating/Pumping Station	IV	VI	IV	Yes

4.4.13 Noise

No significant noise impacts have been identified for the Desert Plan Alternative because there are no sensitive receptors near the route.

4.4.14 Oil Spill Potential and Effects

The Desert Plan Utility Corridor Alternative would have a probability of a spill of 0.35 spills per year (new pipeline and spill greater than 50 barrels) and 2.68 spills per year (pipeline 40 years old and spill greater than 50 barrels).

4.5 Brenda Alternative

4.5.1 Air Quality

Impacts to air quality would be the same as discussed for the Celeron/All American proposal.

4.5.2 Geology

No significant impacts, or geologic hazards which could cause an oil spill and the resulting impacts, would be anticipated on the Brenda Alternative route.

4.5.3 Soils

Impacts to soils would be similar to those discussed in Section 4.2.3. Major impacts would include accelerated soil erosion and deposition, and decreased productivity from compaction. Sensitive soil units along this alternative route are shown on Map 1-2 and described in Table 4-5.

4.5.4 Surface Water

No major water courses would be crossed by this alternative, so surface water impacts would not be expected.

4.5.5 Groundwater

Potential for significant groundwater impacts would increase slightly with this alternative. Crossing of the sensitive La Posa groundwater basin would increase from approximately 10 miles along the proposed route, to 12 miles for the Brenda Alternative.

4.5.6 Aquatic Biology

Because no perennial or larger intermittent streams are located along the Brenda Alternative route, there would be no impacts on aquatic resources.

4.5.7 Terrestrial Biology

The Brenda Alternative route segment is 63 miles long and parallels existing pipeline ROW for about 60 percent of its length. This alternative would affect similar resources as the proposed route including commercial cactus, desert tortoise, and desert bighorn sheep. Commercial cactus species would be removed and salvaged as described for the Celeron/All American proposal and impacts would not be considered significant. Impacts to wildlife would be similar to those described for the Celeron/All American proposal with the exception of impacts to desert bighorn sheep. The Brenda Alternative route would not cross any migration corridors, watering holes, or lambing areas. However, it would come within one-quarter mile of the Lazarus tank lambing ground north of Interstate 10. Construction blasting through the Plumosa Pass area could adversely affect lambing ewes if construction occurred during the lambing season. Construction is not expected to adversely affect sheep at Lazarus tank about 2 miles from the proposed route. Interstate Highway 10 is currently a major barrier to sheep movement in the Plumosa Mountains, therefore, a pipeline following the interstate should not affect sheep movements. The route passes near the Black Mesa rutting grounds, but impacts should not be significant because the route does not occur on the actual grounds and considerable elevation differences exist between the route and the rutting areas.

4.5.8 Socioeconomics

The impacts resulting from the Brenda Alternative include an increase in the tax base of La Paz County, Arizona. Table 4-27 shows the estimated valuation of the line, 1982 assessed valuation, and the percent increase. This does not represent a significant impact. No additional socioeconomic impacts would result from the Brenda Alternative.

4.5.9 Land Use and Recreation

No agricultural or residential land uses occur along this alternative. The Kofa NWR and New Water Mountains WSA #125 would not be crossed by this alternative. No significant impacts are projected to occur.

4.5.10 Transportation

This alternative would have the same impacts on transportation systems as the Celeron/All American proposal, with the exceptions of two crossings of I-10 east of Quartzsite. These crossings would cause no change in traffic flow along I-10.

4.5.11 Cultural Resources

Three known sites are located directly within the proposed ROW; however, none of these sites are considered to be eligible for the National Register. However, additional sites may exist which are significant, and thus, significant impacts to cultural resources could occur along this route.

4.5.12 Visual Resources

There would be no major above-ground facilities or major river crossings in the Brenda Alternative. Only block valves, which would not have a significant visual effect, would be present. Therefore, the visual environment of the Brenda Alternative would not be significantly affected by the Celeron/All American proposal.

4.5.13 Noise

Noise impacts would be similar to those discussed for the Celeron/All American proposal with the exception that residences on the south end of Quartzsite would be subjected to elevated noise levels during pipeline construction. This would be a short-term significant impact.

4.5.14 Oil Spill Potential and Effects

The probability of a spill with the Brenda Alternative would be essentially the same as for the Celeron/All American proposal.

4.6 McCamey to Freeport Alternative

4.6.1 Air Quality

Air quality impacts for the McCamey to Freeport Alternative would be similar to those described for the Blythe to McCamey segment of the Celeron/All American proposal. The summary of maximum short-term impacts resulting from the construction of the alternative pipeline is found in Table 4-28. High background concentrations, in violation of Texas and federal standards, produced predicted violations for CO. As in the prior pipeline construction analyses, the contribution of the construction emissions from this alternative would account for less than 1 percent of the total CO concentration. The nearest ambient CO monitoring station is located in San Antonio, nearly 30 miles away. Since the major contributors of CO emissions are automobiles, the maximum background values at the pipeline are expected to be much less. Since the construction emissions for CO would occur for only a short time in any one area, it again would be unlikely to have the maximum ambient concentrations and maximum construction concentrations occur simultanteously. In addition, since the construction emissions are temporary and transient, the Texas Air Control Board would not consider the CO concentrations as significant impacts (Willis 1984, personal communication).

The operation of the McCamey to Freeport Alternative would consist of five pumping/heating stations. The majority of emissions would be NO_x from the natural gas firing of the heaters. CO and HC would also be emitted with only a trace of TSP and SO_2 emissions. Due to the source configurations, maximum modeled impacts occurred approximately 100 yards from the source. The summary of maximum projected concentrations can be found on Table 4-28. The maximum predicted annual NO_2 concentration at the pump stations of 46 $\mu g/m^3$ would be well under the standard of 100 $\mu g/m^3$. Again, no significant air quality impacts from CO, SO_2, or TSP would be generated from the operation of pump stations along this alternative. Maximum project concentrations for SO_2 and TSP for all averaging times were below 1 $\mu g/m^3$. The maximum predicted 1 and 8-hour CO concentrations were 21.9 and 10.9, respectively. These are 0.1 percent or less of their respective Texas and federal standards.

4.6.2 Geology

Geology and Physiography. Impacts would generally be the same as discussed in Section 4.2.2.1 for the Celeron/All American proposal. Some areas of extensive cuts and fills may be encountered on the Edwards Plateau where widening of the existing ROW may be necessary.

Seismicity and Faulting. There is relatively low risk of seismic or fault activity during the life of the project along this alternative

TABLE 4-28

SUMMARY OF AIR QUALITY IMPACTS FROM CONSTRUCTION AND OPERATION
McCAMEY TO FREEPORT ALTERNATIVE

Pollutant	Maximum Project Concentration (μg/m³)	Maximum Background Concentration (μg/m³)	Total Ambient Concentration (μg/m³)	Texas/ Federal Standard (μg/m³)
Construction				
SO_2				
24-hour	1.6	27	28.6	365
TSP				
24-hour	7.6	217	224.6	260
CO				
1-hour	100.8	22,000	22,101	40,000
8-hour	83.1	12,000	12,083	10,000
Operation				
SO_2				
24-hour	0.05	27	27	365
NO_2				
Annual	7.1[1]	39	46	100
TSP				
24-hour	0.1	217	217	260
CO				
1-hour	21.9	22,000	22,022	40,000
8-hour	10.9	12,000	12,011	10,000

Source: ERT

[1]Based on worst-case concentration between Blythe and McCamey. Concentrations between McCamey and Freeport are expected to be similar.

route. The potential for fault re-activation due to oil field pumping in the coastal plain is unknown.

Slope Stability. It is assumed that the existing ROW paralled by this alternative has been stabilized; however, there is some risk of slope instability along the route, particularly in the Balcones Fault Zone, characterized by steep terrain. The depth of pipeline burial and utilization of erosion control measures should minimize these risks.

Subsidence. Subsidence due to fluids withdrawal may occur along portions of the Gulf Coastal Plain. Although ground surface offsets may expose short sections of the pipeline over time, the strength of steel pipe is sufficient to prevent rupture until the problem can be corrected during routine maintenance. In general, the changes in grade over the coastal plain are such that adverse effects on the pipeline are not anticipated. Offsets directly beneath rigid facility structures at the pump stations could result in more serious damage if not discovered early on during maintenance checks.

Karstic Terrain. Potential effects on the pipeline from karstic terrain on the Edwards Plateau are similar to those discussed in Section 4.2.2.3 for the Celeron/All American proposal.

Paleontology. Potential effects to paleontological resources from McCamey to Freeport are similar to those discussed under Section 4.2.2.3 for the Blythe to McCamey segment.

Mineral/Petroleum Resources. Potential effects to mineral or petroleum resources for the McCamey to Freeport portion are similar to those discussed in Section 4.2.2.3 for the Blythe to McCamey segment.

4.6.3 Soils

Impacts to soils resulting from construction activities would include accelerated soil erosion and deposition, and decreased productivity from compaction and horizon mixing. With the implementation of measures contained in the CU plan, these impacts are not expected to be significant. Soil loss from water erosion would be accelerated by construction especially in the steeper slopes of the Edwards Plateau area. Compaction and soil horizon mixing impacts from construction activities would decrease soil productivity, especially in the irrigated cropland areas characterized by clayey textures and wetness. The predominance of shallow soils, high shrink-swell soils, and highly productive irrigated croplands make the soils along the entire McCamey to Freeport route sensitive.

Sensitive soil units along the McCamey to Freeport pipeline route are described in Table 4-29. These areas are considered sensitive based on the following characteristics which are major potential problems associated with erosion control and revegetation.

- Irrigated cropland (e.g., Brazoria, Wharton, Colorado, Lavaca and Fort Bend Counties of the Texas rice belt area).

TABLE 4-29

MAJOR SENSITIVE SOIL UNITS, McCAMEY TO FREEPORT

Symbol	Location	Sensitive Characteristics	Significant Risks	Representative Soil Series
S35	Edwards Plateau (Pecos to Comal Counties)	Depth to rock, slope, stoniness, high shrink-swell potential	Revegetation, water erosion	Tarrant, Tobosa, Ector
S36	Blackland Prairie and Claypan Area (Guadalupe to Lavaca Counties)	High shrink-swell potential, wetness	Revegetation, compaction	Houston Black, Burleson, Crockett, Lufkin, Axtell
S37	Coast Prairie (Colorado to Brazoria Counties)	High shrink-swell potential, wetness, irrigated cropland, occasional flooding	Revegetation, compaction, disruption of highly productive rice cropland (Texas Rice Belt)	Katy, Clodine, Norwood, Pledger

Source: ERT

- Shallow soils, steep slopes (e.g., Edwards Plateau area).

- Claying, high shrink-swell areas (e.g., Comal, Guadalupe, Lavaca, Colorado, Wharton, Fort Bend, Brazoria Counties).

Significant short-term (one to two years) impacts would result from oil pipeline leaks and ruptures. The agricultural lands of Brazoria, Wharton, Colorado, Lavaca, and Fort Bend Counties would be the most sensitive to oil spills. The clayey soils of Canal, Guadalupe, Lavaca, Colorado, Wharton, Fort Bend, and Brazoria Counties are prone to high shrink-swell conditions which could create revegetation and pipeline instability problems.

4.6.4 Surface Water

Potential significant impacts to surface water resulting from the construction and operation of this alternative would be similar to those discussed under the Proposed Project.

4.6.5 Groundwater

Along the 280 miles of sensitive groundwater basins crossed by the alternative pipeline route, significant impacts could occur in the event of oil spills or leaks during operation of the pipeline. The most highly sensitive area is where the pipeline crosses the recharge zone of the Edwards limestone aquifer west of New Braunfels. In open fractures and solution cavities in limestone, contaminants can move much faster and for greater distances than in porous aquifers. This means that contamination from a point source may affect a greater area but also that the aquifer would be purged of contaminants in a shorter time than for a porous aquifer.

Impacts similar to those described for the proposed project would result from oil spill or leaks in the sensitive groundwater basins along the remainder of the route. Aquifer units include porous bedrock, fractured bedrock, stream alluvium, and coastal plain sediments.

4.6.6 Aquatic Biology

Construction. Primary impacts on the aquatic environment resulting from construction activities during low flow in the summer would be similar to those described for the Celeron/All American proposal. These include substrate removal, increased sedimentation, and habitat alteration. These impacts would result in temporary reductions in plant (algae and macrophytes) and benthic macroinvertebrate abundance, and displacement and possible reduction in resident fish populations, but are not expected to be significant. No critical fountain darter or San Marcos gambusia habitat would be altered during construction. Sufficient information is not available to determine whether critical habitats for Rio Grande darter, river darter, proserpine shiner, or blue sucker would be altered during construction. The river darter would appear to be less affected by increased sedimentation during construction activities than other darters, since they are relatively tolerant of turbidity (Appendix B, Table B-2).

One possible concern during construction would be a gasoline fuel or lubricant spill in the vicinity of a stream. The potential effects on aquatic organisms associated with this impact are discussed in Section 4.2.6.1.

Operation. Impacts on aquatic resources associated with operation of the alternative pipeline would be similar to those discussed for the Celeron/All American proposal. A major oil spill would significantly affect important resident fish populations in the Pecos, South Llano, Guadalupe, San Marcos, Plum, Lavaca, Navidad, Colorado, and Brazos Rivers. Since the proposed alternative crosses the San Marcos River downstream from critical habitat for the fountain darter and San Marcos gambusia, no impacts are expected on these fish populations. Sufficient information is not available to determine whether critical habitat for Rio Grande darter, river darter, proserpine shiner, or blue sucker would be altered as a result of an oil spill.

A major oil spill in the San Bernard, Colorado, or Brazos Rivers could measurably affect nearshore marine communities in the Gulf of Mexico. Of particular importance are the intertidal invertebrates including shrimp (pink, brown and white), oysters, and blue crab. The most sensitive period of development would be the larval stage which occurs in brackish and nearshore marine environments.

4.6.7 Terrestrial Biology

The proposed pipeline route from McCamey to Freeport crosses many of the major geographic areas and vegetative communities in Texas. These habitats support a diversity of birds, mammals, amphibians, and reptiles. General impacts are expected to be similar to those discussed for the proposed project. Much of the proposed alternative pipeline follows existing corridors, and additional construction impacts in these areas are not expected to be significant. Oil spills in these areas could adversely affect local vegetation; most wildlife would not be affected except for species not mobile enough to escape (amphibians, snakes, small mammals).

The proposed pipeline would require new construction in some areas, and limited habitat modification is expected. These modifications should not be significant in the shrub savannah habitats from McCamey to Comal Counties since the habitat is very common or from Comal to Lavaca County where agricultural lands are common. Sensitive habitats which could be significantly affected include wetland habitats in southeastern Texas and riparian vegetation along the major streams and rivers crossed by the pipeline.

Although actual construction impacts at streams, rivers, and wetlands can be kept to a minimum and mitigated by reclamation, operational impacts (oil spills) could significantly affect wetland and other aquatic habitats. These impacts would affect plant and animal communities at the spill location and downstream for several miles.

The proposed pipeline crosses four major rivers in east Texas (Navidad, Colorado, Brazos, San Bernard). All pipeline crossings are within 55 miles of the coast and major accidental oil spills could potentially affect estuarine systems. Wetland communities between the crossings and the coast could also be affected. This region contains significant wetland habitats and supports millions of ducks, geese, and waterbirds, primarily in the winter. A major spill on a river crossing or near a major wetland during winter could adversely affect these species by oiling, decreased survivability of eggs and young, and reductions in food supplies.

Oil from a spill at a river crossing at one of these rivers would potentially reach the coast. The coastal areas also support many wildlife species, including waterfowl, shorebirds, passerines, raptors, terrestrial mammals, marine mammals, and sea turtles. These salt water and estuarine systems are not expected to support any major population of marine mammals or sea turtles, and impacts even from a major spill should not be significant. Marine mammals are known to avoid oil spills.

It is not known at this time if any federal or state threatened or endangered species would be adversely affected by construction or operation of this alternative. Federally listed species will be evaluated in the Biological Assessment (see Appendix B).

4.6.8 Socioeconomics

Two spreads of 335 workers each would construct the approximate 460-mile section of pipeline. Total work force per spread including pump stations would be approximately 385. River crossings would require an additional 30 to 50 workers per crossing for a 6-week period. An estimated eight major river crossings would be constructed. Assuming all pump stations and two river crossings are being constructed simultaneously with the pipeline, peak work force is estimated at 850 workers. It is projected that 60 percent of the work force would be local due to the skilled and unskilled labor availability in the major urban centers of Odessa, Midland, Austin, San Angelo, Houston, San Antonio, and Galveston. The total of these labor forces is over 2.3 million with umemployment rates averaging between 3.9 percent in Austin and 9.9 percent in Galveston. Because of the short duration of pipeline construction, it is assumed that only 15 percent of the total non-local work force would bring their families.

The number of workers would be small relative to the regional population. The largest population increases, less than 5 percent, would occur in Kimble and Crockett Counties. Because of the short duration of the construction period no significant impacts to area employment would occur.

Retail sales and sales taxes are expected to increase throughout the pipeline service communities. The non-local work force is expected to expend up to 37 percent of gross salary on local expenditures. The impact of these expenditures would be positive.

Adequate temporary housing for pipeline workers is available throughout the pipeline route. The section between McCamey and

Kerrville is more sparsely populated than between Kerrville and Freeport; nevertheless as seen in Table 4-30, adequate motel accommodations exist along this stretch.

Based on the significance criteria outlined in Section 4.2.8., no significant impacts would occur due to this alternative.

Operations. The impacts resulting from operation of this alternative would include an increase in the tax base of all counties traversed by the pipeline. Percentage increases would range from 0.12 percent in Crockett County to 6.4 percent in Kimble County. No county would experience a significant impact due to increased valuations. Table 4-31 shows the estimated valuation of 458 miles of pipeline, 1982 assessed valuations, and the percentage increase to the tax base.

4.6.9 Land Use

The greatest potential for adverse impacts from pipeline construction would be in agricultural areas. There are only scattered farm houses or small communities adjacent to the proposed ROW, so impacts to residential land uses would not be significant and only of short duration (1 or 2 days). Within the affected counties, disturbance to irrigated or dryland agricultural land is not considered significant, because disturbance would be less then one percent of any county's agricultural base. The productive rice growing area around Wharton would be the most sensitive area. Although the disruption of farming activities would be for a short duration during construction, it may result in delays in some planting or harvesting, depending on time of construction and layout of the field. Land owners would be compensated for losses.

Temporary gates and other measures would be erected to prevent livestock escape in rangeland areas. After restoration is complete, grazing would again be possible. Only a very small percentage (less than 1 percent) of rangeland in any county would be disturbed. No significant adverse effects on grazing are expected.

The pipeline location is consistent with applicable state and county regulations. Final route selection would be negotiated with private land owners. Road crossings would require easements from the affected jurisdiction but these would be secured from the county commissioners court prior to construction.

No adverse effects would occur to designated recreation areas. Construction would create some disturbance of private lands used for deer or waterfowl hunting, but this would not affect this popular recreation activity or any other recreational opportunity. Potential oil spills could affect sport fin and shell fish (see Aquatic Biology) and public beaches. The resources near the mouths of the Colorado, San Bernard, and Brazos Rivers would be most vulnerable.

4.6.10 Transportation

The McCamey to Freeport Alternative would generate transportation impacts very similar to those described in section 4.2.10, except for

TABLE 4-30

COMMUNITIES WITH ACCOMMODATIONS WITHIN COMMUTING DISTANCE OF THE PIPELINE ROUTE McCAMEY TO FREEPORT

County	Overnight Rooms[1]	Recreational Vehicle Parks[2]		Overnight Rooms[1]	Recreational Vehicle Parks[2]
Iraan	NA[3]	1	Altair	35	NA
Ft. Stockton	711	0	Eagle Lake	59	NA
Crockett	NA	1	El Campo	107	NA
Ozona	216	NA	Wharton	109	NA
Sonora	155	NA	Freeport	141	NA
Junction	146	2	Lake Jackson	262	NA
Kerrville	663	2	West Columbia	127	NA
Fredricksburg	318	2	Yorktown	30	NA
Boerne	125	1	Rosenberg	249	NA
New Braunfels	1,036	9	San Angelo	1797	7
Seguin	289	1	San Marcos	NA	1
Lockhart	51	1	Austin	7419	4
Luling	103	NA	San Antonio	NA	4
Gonzales	136	1			
Hallettsville	116	1			
Shiner	8	NA			
Yoakum	67	NA			

Sources:

[1]4th Quarter 1983 Hotel Tax Accounts, Comptroller: State of Texas.

[2]Limited data are available on numbers of campsites. Numbers of parks represent Texas public campgrounds and Texas Association of Campground Owners sites. Texas state parks are not included in this list but are abundant throughout the stretch between Kerrville and Freeport.

[3]Not Applicable

TABLE 4-31

PIPELINE CONTRIBUTIONS TO COUNTY TAX BASE, McCAMEY TO FREEPORT, TEXAS

County	Total miles	Estimated Valuation of Pipeline & Facilities (thousands $)	Estimated 1982 Assessed Valuation of Counties Traversed (thousands $)	Pipeline Percent of Countywide Valuation (percent)	1982 Countywide Tax Receipts (thousands $)
Upton[1]	5	5,213	1,395,496	0.37	5,846
Pecos	32	15,280	13,021,000	0.12	10,524
Crockett	57	27,219	1,309,000	2.1	7,249
Sutton	51	27,178	1,127,000	2.4	4,455
Kimble	35	16,713	261,000	6.4	1,077
Kerr	24	14,285	1,373,000	1.0	5,682
Gillespie	15	7,163	454,000	1.6	1,135
Kendall	28	13,370	808,000	1.7	3,247
Comal	25	14,763	1,295,000	1.1	5,093
Guadalupe	24	11,460	1,855,000	0.62	14,197
Caldwell	16	7,640	793,000	0.96	4,741
Gonzales	20	9,550	477,000	2.0	1,520
Lavaca	29	13,848	846,000	1.6	3,346
Colorado[1]	18	11,420	632,000	1.8	1,971
Wharton	35	16,713	2,103,000	0.79	14,769
Brazoria	44	21,010	11,325,000	0.19	43,496

Source: ERT

[1]Pump station location.

location. Highways affected would be those listed in Table 3-43. As for the other alternatives, the transportation effects would not be considered significant.

4.6.11 Cultural Resources

It is not possible to assess impacts to specific cultural resource sites due to the absence of site-specific survey work along a specific ROW; however, based on the survey work that has been done to date in the general area, impacts to sites that would be eligible for inclusion on the National Register is likely. Prior to construction along the McCamey to Freeport Alternative route, Class I and Class III surveys would be undertaken and the procedures outlines in the compliance plan discussed earlier would be implemented. These activities would be expected to minimize, but possibly not avoid, all significant impacts to cultural resources.

4.6.12 Visual Resources

Since the McCamey to Freeport Alternative would parallel existing pipelines for the majority of it length, visual impacts from construction along the pipeline ROW are not expected to be significant. Impacts from the pump stations could be significant depending on the final location of the stations.

4.6.13 Noise

Noise impacts for this alternative would be similar to those reported in Section 4.2.13. For areas where sensitive receptors would be within approximately 2,500 ft of construction activity (without intervening terrain barriers), construction noise would exceed the 60 dBA significance threshold. This would be a short-term significant impact.

Operations noise impacts would not be significant unless a pump/heater station were sited within approximately 1,300 ft of a sensitive receptor (see Appendix F, Table F-1).

4.6.14 System Safety and Reliability

There are no design specifications or project construction and operation procedures that are specific to the McCamey to Freeport Alternative. However, the applicant has indicated that these would be essentially identical to the Celeron/All American proposal documents. On this basis, all of the comments pertaining to Celeron/All American Pipeline and Tank Farm Design with Applicable Codes and Standards, Seismic Design Criteria, Corrosion Design Criteria and Corrosion Control Procedures, Pressure Relief and Relief Liquid Disposal System, Control Logic and Soundness of Design for Leak Detection System, Fire Control System, Oil Spill Control System, Operating Procedures, Security Policies, Leak Detection Staff Procedures, and Fire Protection Staff Training and Procedures would apply to this alternative. The only additional item would be in the Pressure Relief and Relief Liquid Disposal System where additional pressure relief devices and tankage would be required at Freeport. Therefore, it appears that the intent of the applicant is to build a project that would comply with all applicable codes, regulations, standards, and generally accepted industry practices. The Freeport Terminal is currently in operation and should meet all applicable codes, regulations, standards, and generally accepted industry practices.

4.6.15 Oil Spill Potential and Effects

Current and future probabilities of oil spills from pipeline failure are summarized in Table 4-32 for the 460-mile McCamey to Freeport Alternative. For this alternative, it is expected that the incidents of spills exceeding 50 barrels would be 0.14 spill per year. At 20 and 40 years, the spill rate is estimated to be 0.41 and 1.06 per year, respectively, for spills greater than 50 barrels.

The soils, aquatic and terrestrial biology, and land use sections summarize areas along the pipeline route identified by resource specialists as being sensitive to an oil spill event. Since final route alignment, elevations, and check valve placement have not been determined by the applicant, potential site-specific oil spill volumes cannot be estimated for these sensitive areas. In order for resource specialists to evaluate potential impacts, a worst-case spill volume of 15,000 barrels is assumed for each sensitive area. This may be considered a very conservative estimate since final pipeline design information would most likely indicate much smaller potential oil spill volumes at these locations.

4.7 Single Pipeline Alternative

A possible alternative to the Celeron/All American and Getty proposals would be the construction of a single pipeline from Las Flores to Emidio. The Single Pipeline Alternative would have essentially the same impacts as the Getty proposal for most resource areas. Compared to implementing both proposals most construction-related impacts would be the same or smaller in magnitude. Impacts resulting from oil spills would potentially be much smaller.

Assuming a single 400,000 BPD pipeline were constructed, the total socioeconomic impacts identified for the Celeron/All American and Getty proposals would be cut approximately in half. This suggests that estimated short-term retail sales and sales tax receipts and long-term ad valorem tax revenues would be reduced by approximately 50 percent. The demand for overnight lodging during construction would also be reduced, resulting in lower displacement of tourists or travelers. However, impacts in these areas for the Las Flores to Emidio segment were not predicted to be significant for the Celeron/All American and Getty proposals.

The potential for oil spills and resulting volumes of oil released would be similar for either a single pipeline or two parallel pipelines from Las Flores to Emidio, except under certain conditions and circumstances. With two parallel pipelines, the potential for both pipelines rupturing or leaking at the same time and location is highly

TABLE 4-32

CURRENT AND FUTURE PROBABILITIES OF SPILLS USED AS A BASIS FOR AN "OVER LIFE OF PROJECT" ASSESSMENT, McCAMEY TO FREEPORT

Assumptions	McCamey to Freeport Alternative
Diameter	30-inch
Volume	300,000 BPD
Length	460 miles
Pipeline Life	30-40 years
Spill Incidents[1] (New pipeline 1984)	
Spills greater than 50 bbl	
- Overall length of pipeline	0.14
- Each mile	0.0003
Spills greater than 9.5 bbl	
- Overall length of pipeline	0.32
- Each mile	0.0007
Spill Incidents (Pipeline 20 years old)	
Spills greater than 50 bbl	
- Overall length of pipeline	0.41
- Each mile	0.0009
Spills greater than 9.5 bbl	
- Overall length of pipeline	0.83
- Each mile	0.0018
Spill Incidents (Pipeline 40 years old)	
Spills greater than 50 bbl	
- Overall length of pipeline	1.06
- Each mile	0.0023
Spills greater than 9.5 bbl	
- Overall length of pipeline	2.07
- Each mile	0.0045

[1]Other spill rates reported in the literature include:

Probability	Source
0.0022 spills/pipeline mile-year	OIW 1978; USCG PIRS data 1973-1977, spill greater than 2.4 bbl; all pipeline sizes and ages
0.0013 spills/pipeline mile-year	EPA 1982a; 10-inch diameter pipeline 25 years old
0.00176 spills/pipeline mile-year	National average - reported by Mastandrea 1983

unlikely except at stream crossings (where flood scour associated with channel degradation could rupture both lines simultaneously) or at the South Branch Santa Ynez, and San Andres Fault crossings (where earthquake movement could also rupture both lines simultaneously). With a single 400,000 BPD capacity pipeline (similar to the proposed Getty pipeline), an event at the South Branch Santa Ynez or San Andres Faults or any heavily scoured stream crossing would release 2,100 to 3,200 barrels of oil. Table 4-26 in Section 4.2.15 summarizes estimated spill volumes for the single Getty pipeline at the South Branch Santa Ynez and San Andreas Faults and at select stream crossings.

The Single Pipeline Alternative would require the same size construction ROW (100 ft maximum) as the Celeron or Getty proposals. Although the construction period would be reduced, impacts to surface resources would be essentially the same. Potential impacts from oil spills would have similar probabilities, but the volumes of oil that could be released during an earthquake or major flood would be less. With a single, 400,000-BPD capacity pipeline similar to Getty's, a catastrophic oil spill event would release about half the volume that would result from two pipelines rupturing (see Oil Spill Potential). Significant impacts to soils, surface water, aquatic biology, and terrestrial biology would still occur (depending on location), but the areal extent of the spill and duration of significant impacts would be less.

4.8 No Project Alternative

Under the No Project Alternative, required permits would not be issued and the proposed Getty and Celeron/All American pipelines would not be constructed. In the existing timeframe, the only other viable means of transporting the anticipated volumes of OCS crude oil from the Santa Barbara region would be by oil tankers to PADD V or PADD III coastal refineries or by pipeline to Los Angeles. The Getty Gaviota Marine Terminal Application (1983) estimates a marine terminal throughput of 150,000 to 300,000 BPD and the LFT Application (SAI 1983) estimates a throughput of 175,000 to 350,000 BPD. Assuming a peak production of about 500,000 BPD of OCS crude (ADL 1984) and that only one of these marine terminals is constructed, an excess of 150,000 to 350,000 BPD of oil would occur and require transport by additional tankers or other pipelines. The Los Angeles refineries with major retrofits could conceptually accept about 200,000 BPD through a pipeline. This would leave a surplus of up to 150,000 BPD for transport by additional tankers. If all 500,000 BPD were shipped by tanker [assuming 50,000 DWT tankers and 320,000 barrels per tanker (ADL 1984)] about 2 tanker trips per day would be required.

The impacts presented for the Celeron/All American and Getty proposals along the proposed pipeline routes would be avoided by the No Project Alternative; however, additional impacts would occur in Santa Barbara County as a result of the expanded marine terminals and increased marine tanker traffic. These impacts would occur primarily in the areas of air quality, socioeconomics, and oil spills and are discussed in the following paragraphs.

Increased reliance on tankers for transport of OCS crude oil would require development of expanded marine terminal facilities in the Santa Barbara south coast area, with corresponding increases in the emissions of air pollutants. The principal sources of such emissions include combustion of fuel oil by tankers visiting the terminal, fugitive hydrocarbon emissions during loading, and combustion emissions from support vessels in the terminal area. In general the emissions associated with tanker crude oil loading facilities are substantially greater than those that would result for equivalent transport by pipeline. Issues of potential concern with regard to marine terminal emissions include compliance with federal and state ambient air quality standards and PSD increments, odors, and visual impacts of tanker stack plumes. Details on the air quality impacts of marine terminals can be found in the Getty Gaviota Consolidated Coastal Facility Draft EIR (ERT 1984, pp 4-2 through 4-16) and the Oil Transportation Plan DEIR (1984, pp 7-1 through 7-25).

The socioeconomic effects that would result from not implementing the Celeron/All American and Getty proposals would be most evident with respect to two areas: county-wide tax bases and transient housing. These impacts occur to varying degrees relative to the pipeline location (county) and facility to be constructed (tank farm vs. pipeline). If the Getty and Celeron/All American pipeline projects were not constructed, there would be no increase in county-wide tax bases. The impact would be no increase in ad valorem property tax revenues in the long term, and fewer sales tax receipts from pipeline company, contractor, and construction worker purchases in the short term. Existing demand for permanent housing, overnight accommodations, and camping sites would remain the same without project construction. Displacement of tourists or travelers caused by the construction work force lodging requirements in communities along the pipeline route would not occur.

Socioeconomic impacts from construction and operation of expanded marine terminal facilities required for the No Project Alternative would affect the following areas: employment, housing, recreation, and public services such as electrical, water and sewer, fire, and police. These effects would be primarily in the Santa Barbara region. Beneficial impacts would include increased ad valorem and sales tax revenues. Other impacts could be experienced with the greater probability of oil spills. The Santa Barbara County south coast is a very important tourist, commercial fishing, and kelp harvesting area which contribute significantly to the economic well-being of the region. If an oil spill did occur, significant negative economic impacts would be experienced in the coastal region. For more information on socioeconomic impacts associated with marine terminals, refer to the Getty Gaviota Consolidated Coastal Facility Draft EIR (ERT 1984, pp 4-48 through 4-58)).

Associated with the increased tanker traffic along the Santa Barbara coast would be an increase in risk of oil spill, fire, and explosion. In the event of a large oil spill due to operational accidents, tanker collision, or tanker grounding, there would be a potential for significant impacts upon sensitive marine fish and mammals and on recreational areas. The No Project Alternative would increase tanker traffic by 1 percent over existing levels and by 1 to 6 percent over projected levels. The risks for tanker accidents and resulting oil spill impacts have been addressed in detail in the Getty Gaviota Consolidated Coastal Facility Draft EIR (ERT 1984, pp 4-77 through 4-93), revised DEIS/DEIR for the Santa Ynez/Las Flores Canyon Development and Production Plan (SAI 1983, pp 6-210 and 6-211) and the Oil Transportation Plan DEIR (1984, pp 7-26 through 7-31).

4.9 Cumulative Impacts

The interrelated projects presented in Chapter 2, along with the Celeron/All American and Getty pipeline projects, were analyzed for cumulative impacts. The only measureable cumulative impact that would result from these projects would be in the area of socioeconomics. The employment requirements, housing needs, transportation needs, income earned by construction workers, and increased tax benefits would be interrelated. During the 6-month construction period, the Getty pipeline project would employ up to 126 local and 126 non-local construction employees and would generate about $281,232 per week in wages. During the construction phase the project would increase the tax base by about 0.51 percent in Santa Barbara County. The Celeron/All American pipeline project would employ up to 198 local and 199 non-local construction employees and would generate about $443,052 per week in wages. This project would increase the tax base by about 0.53 percent in Santa Barbara County. No long term employment impacts would be experienced due to the small operations and maintenance work force. Peak employment levels for the interrelated projects on a regional basis are projected to exceed 77,000 workers in 1988. Personal income gains are projected to be over $1.5 billion for this period. Getty and Celeron/All American combined represent less than 1 percent of the total peak employment and because of the short period of construction, the payroll generated would be less than a 0.1 percent. These increments are important but not significant.

Cumulative housing impacts would be significant. There would be short-term impacts during construction for the Getty and/or Celeron/All American projects alone, and these impacts would be increased by the interrelated projects which would have much larger impacts on housing. The variations in actual construction schedules may moderate but not eliminate the shortage in worker housing.

The All American Pipeline and the PACTEX Pipeline and Southern California Edison (SCE) new Palo Verde-Devers transmission line could result in cumulative impacts to wildlife and land use where these facilities are proposed to cross the Kofa NWR. These projects would be constructed in the same general location; thus, three new corridors could compound the changes created by the existing El Paso Gas Pipeline and Palo Verde-Devers 500-Kv Transmission Line. The worst-case impact scenario would assume that each project would be constructed on a separate ROW. Assuming the ROWs would parallel the existing disturbance across 26 miles of the NWR; a corridor up to 700 ft wide could be created across the Refuge and a total of 2,206 acres of habitat could be disturbed. This wide a corridor would likely utilize the entire area available for pipelines and transmission lines since either side of the existing ROWs consists of wilderness study areas. However if stipulations require the three pipelines to be located in the existing El Paso Gas ROW disturbance could be reduced to an estimated 350-ft wide corridor for a total disturbance of 1,050 acres.

Construction of all three proposed projects would result in the loss of wildlife habitat and adversely affect visual quality and recreational activities in the Refuge. The construction of future pipelines and transmission lines would also adversely affect desert bighorn sheep if construction occurred when sheep were using the migration corridors (April-May and September-October) or lambing (March-May). After construction, bighorn sheep may continue to avoid the disturbed area; recent studies indicate bighorn sheep currently exhibit a behavioral aversion to crossing under the existing transmission lines (L. Smith 1984, personal communication). It is not known why sheep avoid this area; it may be a combination of factors including disturbed habitat, visual obtrusion caused by the towers, traffic along the gas pipeline access road, and the occasional "buzzing" of transmission line conductors. The U.S. Fish and Wildlife Service (FWS) has expressed concern that a wider corridor could create a barrier to sheep movement (Haderlie 1984, personal communication). Interstate 10 has already cut off the movement of sheep through the Plumosa Mountains. Recent studies also indicate the Livingston Hills may be important habitat for the survival of sheep using surrounding areas. FWS plans to close the Crystal Hills campground in an effort to minimize current disturbance in the area.

In conclusion, if future pipelines were constructed in the same ROW as the existing El Paso Gas Pipeline, cumulative impacts would be significantly reduced. However, since the new transmission line would require a minimum of 130 ft of clearance from the centerline of the existing transmission line, some cumulative impacts from a new transmission line would be expected.

4.10 Mitigation Measures

The following mitigation measures have been developed to mitigate the significant impacts that were identified earlier in this chapter. Where impacts were deemed to be not significant, no mitigation measures were developed. The measures contained in this section have been committed to by the California State Lands Commission, BLM, Forest Service, and Santa Barbara County, and these agencies will be responsible for their enforcement. Thus, the mitigation measures will not be just suggestions but will be specific requirements of both Getty and Celeron/All American as part of their ROW grants or permits. As noted in several of the following measures, the federal authorized officer will direct the detailed implementation of certain measures.

In addition to the mitigation measures contained in this EIS, the BLM, FWS, and Forest Service will attach standard and special ROW stipulations to their ROW grants (see Appendix J for a preliminary list of special ROW stipulations). These stipulations will contain generic measures that are applied to all ROWs as well as site-specific measures whose need may be identified at the time the pipeline centerline is surveyed. The required surveys for cultural resources and protected animals, for example, will likely identify the need for site-specific stipulations.

Federal agencies (BLM, Forest Service, FWS, and Department of Defense) can enforce mitigation measures and stipulations on Federal lands and private lands that are affected as a result of a Federal action. The California State Lands Commission has no direct enforcement authority other than on state-owned lands; however, it can require certain measures as a condition of the permit it will issue and rely on other state agencies, such as the Department of Fish and Game, to enforce these conditions. Mitigation measures and stipulations contained in the conditional use permit issued by Santa Barbara and other Counties will be required and enforceable on private land as well as public land.

4.10.1 Air Quality (none required)

4.10.2 Geology

Measure 1: Appropriately detailed geologic, seismologic, and geotechnical studies will be conducted to identify and characterize geologic hazards and to design earthwork and foundations along the pipeline route and at pump and heater stations, tank farms, and delivery stations.

Effectiveness: These types of studies will identify existing geologic and seismologic hazards such as landslides, subsidence scarps and fissures, karstic sinkholes, Holocene faults, and areas susceptible to liquefaction that can either be avoided by relatively minor re-routing, or accomodated by remedial earthwork or special structural design. Special attention should be given to further evaluating potential for damaging movement on the Quaternary faults listed on Tables 3-3 and 3-5, particularly the South Cuyama and White Wolf. Areas with moderate to high potential for future development of geologic hazards will be identified so that an appropriate program of surveillance and monitoring can be established, if necessary. Recommendations and design criteria for earthwork and foundations will be developed to accomodate site-specific conditions.

Application: This measure will be applied to the Celeron/All American and Getty proposals and all alternatives.

Measure 2: Appropriate ground motion parameters will be developed for use in seismic design of critical structures and equipment, including pumps, valves, piping, communications systems, and instrumentation. Use of the dual Contingency Level/Operating Level Earthquake concept, or equivalent, is recommended.

Effectiveness: Appropriate seismic design, especially for the Las Flores to Blythe portion of the route, will minimize the potential for serious damage leading to oil spillage as a result of strong ground shaking. Earthquake-resistant design is sufficiently advanced so that this measure should prove very effective.

Application: This measure will be applied to the Celeron/All American and Getty facilities and all alternatives within California. Studies to determine the need for such measures along the remainder of the route will be conducted as part of measure 1, Section 4.10.2.

Measure 3: Special geologic/seismologic studies will be conducted to characterize potential surface offset at the South Branch Santa Ynez, San Andreas, and Garlock faults, and appropriate crossings will be designed. Similar studies will be conducted for any other faults that show evidence of Holocene offset (within approximately the last 11,000 years) at the pipeline crossing.

Effectiveness: Adequate historical and geologic data exist to characterize an appropriate design fault offset event for the San Andreas. Some field study may be necessary to delineate the limits of the zone across which movement could occur. Historical data are less abundant for the South Branch Santa Ynez and Garlock faults, but geologic data and comparison to other similar known active faults provide a basis for developing design events. Again, some field study may be required. Having selected an appropriate offset, design techniques are available to minimize the potential for pipe rupture and/or to minimize the amount of oil spillage if a rupture occurs. These include:

- Pipe burial in V-shaped ditch with loose backfill.
- Placement of pipe on ground surface with loose soil cover.
- Placement of oil pipe within larger diameter expendable pipe.
- Use of extra-strength steel pipe.
- Placement of seismically triggered block valves on either side of fault.
- Construction of earth dike to contain spillage; use of earthen or synthetic liner in holding basin.

Application: This measure will be applied to the Celeron/All American and Getty proposals and alternatives at crossings of Holocene faults.

4.10.3 Soils (none required)

4.10.4 Surface Water

Measure 4: During pipeline construction at stream crossings, construction contractors will minimize time of disturbance and area disturbed, stabilize disturbed areas promptly, and divert runoff waters into settlement areas prior to discharge into a watercourse. Where construction activities are necessary in the channel, particularly La Brea Creek, the channel will be disturbed as little as possible and for as short a time as possible.

Effectiveness: An increase in sediment loadings during construction of stream crossings is unavoidable. Application of this measure will minimize the impact of construction at stream crossings.

Application: The measure will be applied to the Celeron/All American and Getty proposals and all alternatives.

Measure 5: Pipeline operators will check the pipeline burial depth yearly at major crossings identified in this report. At crossings where channel degradation has reduced the depth of fill to less than the 100-year scour depth, reburial of the pipeline to the proper depth will be required.

Effectiveness: The burial depth of 4 ft below the scour of the 100-year, 24-hour storm runoff event is required by DOT regulations. This requirement minimizes the chances of possible pipeline breaks during large runoff events. Some of the major streams crossed by the pipeline have been disturbed and the channels are degrading in the vicinity of the pipeline crossing. Maintaining deep enough pipeline burial is important to minimizing the risk of an oil spill.

Application: This measure will be applied to the Celeron/All American and Getty proposals and all alternatives.

4.10.5 Groundwater

Measure 6: Detailed hydrogeologic investigations will be conducted for each sensitive area along the alignment as indicated in Table 3-14. These investigations will include definition of groundwater depth, recharge sources, properties of overlying soils, hydraulic gradient, background water quality, and existing water uses. Existing wells will be inventoried in an area extending hydrogeologically down gradient from the pipeline for a minimum distance of 2 miles. This information will be used to formulate an Oil Spill Contingency and Response Plan that will include plans for monitoring and early detection of groundwater contamination, notification of affected groundwater users and appropriate governmental agencies, site-specific cleanup and response, and identification of emergency alternate water supplies. Hydrogeologic investigations will also be used to define specific areas that will require mitigation measures in the design and construction of the pipeline.

Effectiveness: These hydrogeologic investigations and contingency plans will make appropriate information available in sensitive areas to allow for early detection and response to spills or leaks rather than attempting to get this information after a spill has occurred. This is particularly important in populated areas where groundwater is extensively used for municipal or domestic supplies.

Application: This measure will be applied to the Celeron/All American and Getty proposals and all alternatives.

Measure 7: Low permeability backfill will be used in the bottom and sides of pipeline trenches where the alignment crosses sensitive aquifers which are at risk from oil spills and leaks. This measure will be implemented in selected sensitive areas where shallow depth to water, high vertical permeabilities, and a high degree of groundwater use are indicated by hydrogeologic investigations performed in Measure 1 above.

Effectiveness: This method of trench backfill will force leaking oil to the surface rather than permitting downward seepage. This will facilitate early leak detection and simplify cleanup procedures.

Application: This measure will be applied to the Celeron/All American and Getty proposals and all alternatives.

4.10.6 Aquatic Biology

Measure 8: Fueling and lubrication of construction equipment will not occur within 0.25 miles of streams. No more than 2 barrels of fuel (about 84 gallons) should be kept at construction sites within 0.5 mile of sensitive streams (Table 4-6). Equipment will be periodically checked for leakage to avoid spills. If a spill does occur, it should be reported to the Authorized Officer immediately.

Effectiveness: Refueling away from streams and periodic maintenance should reduce the risk of construction-related spills.

Application: The measure would be applied to the Celeron/All American and Getty proposals and all alternatives.

4.10.7 Terrestrial Biology

Measure 9: Development will avoid disturbance to sensitive and valuable plant communities including riparian areas, oak woodlands, Coulter pine, live oaks, Joshua tree woodlands, desert dunes, and ironwood washes. Locations to be avoided will be determined by the landowner, land manager or applicable regulatory agency. The construction ROW will be reduced to 50-ft wide at riparian and desert wash crossings. Staging areas will not be located in sensitive communities. The landowner, land manager or regulatory agency may reduce the construction ROW in specific locations to minimize impacts to other sensitive plant or wildlife communities.

Effectiveness: Avoiding and minimizing disturbance to sensitive areas and unique plant communities will minimize loss of vegetation and wildlife habitat by 50 percent.

Application: This measure will be applied to the Celeron/All American and Getty proposals and all alternatives.

Measure 10: During construction in creosote scrub and alkali scrub areas of the desert, ROW clearing will be limited to trimming or crushing whenever possible. The new ROW will be located immediately adjacent to existing disturbance, especially roads.

Effectiveness: This measure will limit the amount of shrub vegetation disturbed and reduce erosion. By not disturbing the root system, many crushed or clipped shrubs will resprout and revegetate the ROW more quickly, reducing soil erosion and speed re-establishment of wildlife habitat.

Application: This measure will be applied to the desert portions of the Celeron/All American proposal, the Desert Plan, and Brenda Alternatives.

Measure 11: During construction in desert areas, some of the cleared or clipped vegetation will be piled in small thickets off the ROW (where acceptable to the landowner or land manager) to provide cover for displaced animals.

Effectiveness: Providing cover for displaced small mammals and reptiles, especially small desert tortoise, will decrease heat stress and minimize exposure to predators.

Application: This measure will be applied to the desert portions of the Celeron/All American proposal, the Desert Plan, and Brenda Alternatives.

Measure 12: Vehicle operation off the ROW by construction workers will be prohibited except where specified by the landowner or land management agency.

Effectiveness: Limiting vehicle use off the ROW will minimize the risk of impacting livestock, wildlife habitat, small mammals, reptiles, and important or sensitive vegetation in surrounding habitats. This will be especially important in desert dune areas and in desert bighorn sheep range.

Application: This measure will be applied to the Celeron/All American and Getty proposals and all alternatives.

Measure 13: During construction the open pipeline trench will be limited to 0.5 mile in desert bighorn sheep areas or areas where the pipeline could limit wildlife access to water, such as in La Brea Canyon in California, and Hot Springs Creek in Arizona. Skip sections or temporary bridges across the pipeline trench will also be used if more than 0.5 mile of trench must remain open for an extended period.

Effectiveness: This will minimize impacts caused by water stress and disruption of movement patterns. Not all animals are accustomed to crossing skip sections, however it will provide an opportunity for wildlife (like deer and coyotes) accustomed to human presence to cross the pipeline trench.

Application: This measure will be applied to the Celeron/All American and Getty proposals and all alternatives.

Measure 14: A competent wildlife biologist will survey all potential raptor nesting habitat within 0.5 mile of the pipeline prior to construction. Active and inactive nests will be identified. No construction will occur within 0.5 mile of active eyries during the nesting season (March 15 to July 15). Construction will be permitted near inactive nests; however, no nest sites will be disturbed.

Effectiveness: This measure will prevent nest abandonment resulting from pipeline construction. It will also help provide flexibility for construction scheduling.

Application: This measure will be applied to the Celeron/All American and Getty proposals and all alternatives.

Measure 15: Blunt-nosed leopard lizard and San Joaquin kit fox habitat in the Cuyama Valley will be evaluated. Where suitable habitat occurs, attempts to relocate the pipeline (primarily to agricultural lands) will be considered. In habitat that must be affected, the construction disturbance on the ROW will be limited to 50 ft or less. If kit fox dens are found in the ROW, the pipeline ROW will be altered to miss dens; no construction will be allowed during the pupping season. Revegetation plans will include measures to encourage re-establishment of suitable habitat.

Effectiveness: Avoiding leopard lizard and kit fox habitat will be the most effective measure of ensuring that these animals are not affected. Where construction must occur in their habitat, some lizards will still be impacted by vehicles and trenching equipment; however, the population may be able to survive the loss of a few individuals if the habitat is restored and land use practices on the ROW do not change. The timing constraint will minimize losses of individual kit foxes during trenching. Kit fox will still be displaced to other areas as a result of construction and operation activities. Minimizing the construction ROW width would minimize loss of habitat by 50 percent. Moving the pipeline to agricultural areas will impact crop lands, resulting in a trade-off of impacts. Impacts to croplands can be minimized by seasonal restrictions and double trenching techniques.

Application: This measure would apply to the Celeron/All American and Getty proposals.

Measure 16: Pipeline construction across desert tortoise habitat will occur between October and March when tortoises are hibernating. A desert tortoise expert will be present during construction. Any active desert tortoises will be removed from the construction ROW ahead of construction equipment and moved to habitat within 100 yds of the capture site. Burrows within the ROW will be carefully opened using hand tools and hibernating tortoises removed. Tortoises unearthed by the trencher will be removed to an artifical burrow within 100 yds of the capture site. Injured tortoises will be turned over to the Department of Fish and Game. Adequate funds for costs involved in rehabilitating injured tortoises and returning them to their home sites (within 100 yds of capture site) will be paid by the applicant.

Effectiveness: Injuries and deaths of tortoises will be minimized if construction occurs when tortoises are inactive (i.e., only tortoises hibernating right on the ROW would be impacted). Removal of active tortoises from the construction area will ensure survival of these individuals. Burrows can be successfully constructed with hand tools and plywood (Berry 1984, personal communication).

Application: This measure would apply to the Celeron/All American proposal, the Desert Plan, and Brenda Alternative.

Measure 17: Oil spill booms will be located as near as possible to the man-made wetlands downstream of the Colorado River crossing. In the event of a spill these booms would be used to prevent oil from entering backwater wetlands from the river, or reaching Yuma clapper rail habitat 20 miles downstream.

Effectiveness: Booms have been used effectively for many years in containing oil and directing it to areas for cleanup. Locating booms near the crossing will minimize response time and minimize the possibility of oil reaching sensitive habitats (such as Cibola and Imperial NWR and Yuma clapper rail habitat) downstream.

Application: This measure will be applied to the Celeron/All American proposal and the McCamey to Freeport Alternative.

Measure 18: No construction will be allowed in the Copper Bottom Pass area during January to March (lambing) and May to October (water stress) periods. No construction will be allowed in the Plumosa Pass area during the January to March lambing period. Any effects on bighorn sheep water resources will be mitigated through avoidance or construction of new wells, or collectors.

Effectiveness: This measure will reduce impacts on bighorn sheep in the Dome Rock Mountains, but will not be completely effective because pipeline maintenance and access into this remote area would eventually disturb bighorns. This measure will eliminate disturbance impacts on lambing bighorn in the Plumosa Pass area.

Application: This measure will be applied to the Celeron/All American proposal.

Measure 19: No pipeline construction in the Kofa NWR will be allowed during bighorn use of the migratory corridors. Avoidance periods and formal restrictions will be determined by FWS.

Effectiveness: This measure will not limit existing disturbance because the route through the NWR follows an existing pipeline, transmission line, and access road. It will eliminate impacts related directly to disturbance of bighorn sheep due to pipeline construction activity.

Application: This measure will be applied to the Celeron/All American proposal.

Measure 20: At the Muleshoe Ranch Preserve, construction will occur between August 30 and April 1. Revegetation will be in accordance with plans determined by the Nature Conservancy, BLM, and Forest Service. The ROW will utilize the existing El Paso ROW to the extent possible. Large sycamores in Bass Canyon will not be removed.

Effectiveness: Seasonal construction restrictions (i.e., no activity during the April to August nesting season) will prevent nest abandonment by nesting raptors resulting from construction activity. Reseeding with native vegetation and minimizing impacts to riparian communities will decrease impacts on wildlife and wildlife habitat.

Application: This measure will be applied to the Celeron/All American proposal.

Measure 21: Where the pipeline ROW follows the existing El Paso Natural Gas ROW or other existing ROWs, the old ROW will be used as part of the construction ROW and new disturbance will be limited to the area needed for trenching and stockpiling backfill.

Effectiveness: Using the existing ROW for construction will minimize the total area cleared, wildlife habitat lost, and area to be revegetated. Using the existing ROW would significantly minimize the total acres disturbed.

Application: This measure will be applied to the Celeron/All American proposal.

4.10.8 Socioeconomics

Measure 22: The pipeline construction period will be scheduled so as not to coincide with peak tourist seasons. The areas affected by tourism include: Santa Barbara County Coastal Area - June thru August; LPNF - August thru November; Blythe, California - April thru September; Quartzsite, Arizona - November thru April.

Effectiveness: This action will minimize competition for temporary housing and camping sites between tourists and construction workers.

Application: This measure will be applied to the Celeron/All American and Getty proposals and all alternatives.

Measure 23: Between Barstow and Blythe, Blythe and Phoenix, and El Paso and Odessa, workers will be accommodated in areas where housing is available, and transportation to and from the job site will be provided.

Effectiveness: This measure will centralize the impact on housing demand in areas that have sufficient resources to accommodate the construction work force.

Application: This measure will be applied to the Celeron/All American proposal, the Desert Plan, and Brenda Alternative.

Measure 24: Temporary accommodations for construction workers will be provided at locations where housing is limited (eastern California, western Arizona and west Texas).

Effectiveness: This action will reduce conflicting demands for limited temporary housing between construction workers, tourists, and other travelers. It will also reduce commuting distances in areas where little or no temporary housing is available near the pipeline corridor.

Application: This measure will be applied to the Celeron/All American proposal, the Desert Plan, and Brenda Alternatives.

4.10.9 Land Use and Recreation

Measure 25: After construction has been completed motorized vehicle access to public lands crossed by the ROW will be restricted on federal lands (as requested by the agency) by gates or other barriers.

Effectiveness: This measure will enhance revegetation efforts and limit the proliferation of spur roads in sensitive resource areas. Agency regulations limit development of new roads in these areas.

Application: This measure will be applied to the Celeron/All American and Getty proposals and all alternatives.

Measure 26: Celeron/All American will formally request modification of the designated utility corridors from Riverside County.

Effectiveness: This measure will bring the ROW into compliance with the county's plans.

Application: This will be applied to the Celeron/All American proposal.

Measure 27: The All American Pipeline ROW will be moved from the west side to the east side of the dirt road that forms the Palen to McCoy WSA boundary from milepost 260 to milepost 270.

Effectiveness: This measure would remove the ROW from within the boundary of the WSA and ensure compliance with WSA Interim Management Policy.

Application: This measure will be applied to the Celeron/All American proposal.

Measure 28: Within the section from Las Flores to Emidio, the Celeron and Getty Pipelines will be constructed within the same ROW as designated by the Authorized Officer. This could be accomplished by phasing of construction, and laying one pipe as close as practicable from the ROW edge and then later placing the next pipeline as close as practicable from the other side of the ROW, resulting in a minimum distance between pipe centers.

Effectiveness: This measure would reduce by one half the amount of disturbance and land use impacts associated with construction of two pipelines.

Application: This measure would apply to whatever ROW is found to be preferred.

Measure 29: Important historic areas and structures will be avoided at Patton's Camp ACEC.

Effectiveness: Impacts to protected areas will be avoided.

Application: This measure will apply to the Desert Plan Alternative.

4.10.10 Transportation (none required)

4.10.11 Cultural Resources

Measure 30: Cultural resources mitigation will result from the implementation of a detailed compliance plan that will be developed by the land management agencies, in consultation with the SHPO, prior to the start of pipeline construction. A typical compliance plan would include the following items:

- An intensive cultural resource survey of unsurveyed portions of the proposed pipeline route will be undertaken to include a 200-ft wide corridor centered on the proposed ROW centerline, and along any new or upgraded facilities access roads. All cultural resources will be recorded and evaluated given the existing conditions and artifactual arrangements.

- Further evaluation may be necessary in some cases to determine site extent, integrity, and significance. A test program will be implemented to determine whether further data recovery is necessary in lieu of site avoidance, applying eligibility criteria for the National Register and significance criteria defined in CEQA Appendix K.

- Site-specific mitigation measures will be developed for all cultural resources as required. Mitigation may not be required for all sites. Avoidance by project design is preferable, in most cases, however further data recovery may be necessary to negate impacts. Data recovery programs will be designed to reflect the individual research potential of a resource and contemporary scientific expectations.

- Data recovery programs will be undertaken prior to project groundbreaking; field work will be completed prior to construction. Data recovery programs will include analysis and reporting of findings.

- Archaeological monitoring during ground disturbing construction activities may be necessary in various sensitive areas or where survey procedures were hampered by terrain and vegetation. These will be defined during evaluation procedures.

- Contact will be maintained with appropriate Native American groups to determine the nature and extent of concerns regarding specific cultural resources. Native Americans will participate in test and data recovery programs commensurate with tribal policies and federal agency requirements.

Effectiveness: The cultural resources compliance plan will ensure that the effects of pipeline construction and operation on cultural resources is fully considered as required by law.

Application: This measure will be applied to the Celeron/All American and Getty proposals and all alternatives.

4.10.12 Visual Resources

Measure 31: The Gaviota pump station, Sisquoc pump station, Essex pump station and tank farm, and Tom Mix pump station will be screened with native shrubs and trees and/or naturalized masses of evergreen shrubs and trees as is appropriate for location and climatic conditions.

Effectiveness: The placement of trees and shrubs between the facility and existing sensitive receptors will eliminate the intrusive character of the facility. The FVC for all locations where such screening is proposed is indicated below.

Getty:

- Gaviota pump station - to screen from US 101, Vista del Mar Union School, and the Gaviota Store and Restaurant (FVC II)

- Cuyama pump station - to screen from Highway 166 (FVC III).

Celeron Segment:

- Gaviota pump station - to screen from US 101 and the Gaviota Store and Restaurant (FVC II).

- Sisquoc pump station at La Brea Canyon - to screen from Foxen Canyon Road and La Brea Canyon Road (FVC II).

All American Segment:

- Twelve-Gauge Lake pump station - to screen from Highway 58 (FVC IV).

- Tom Mix pump station - to screen from US 89 (FVC III).

Desert Plan Alternative:

- Essex pump station and tank farm - to screen from US 66 (FVC IV).

Application: This measure will be applied to the Celeron/All American and Getty proposals and Desert Plan Alternative.

Measure 32: For the pipeline segments on the LPNF, in La Brea Canyon, and on Miranda Pine Mountain, Celeron will utilize a 50-ft wide construction corridor, protect existing large diameter trees, feather the edges of the cleared ROW, and reseed cleared areas with native species, as determined by the Authorized Officer.

Effectiveness: The smaller construction corridor will provide selective protection for large trees in forested areas. Feathering the edges of the clearing will soften and partially disguise the visual impact resulting from cutting a path through the trees. The effectiveness of this measure will depend on the pre-project visual condition of the specific site: areas previously characterized as "untouched landscape" (EVC I) or "unnoticed alterations" (EVC II) will be deteriorated to the category of "minor visual disturbance" (FVC III). Areas of existing visual disturbance ranging from minor to drastic can all be restored to "major visual disturbance" (FVC V) by scalloping edges of vegetative clearings.

Application: This measure will be applied to the Celeron/All American and Getty proposals and the Santa Maria Canyon Alternative.

Measure 33: The La Paz heating/pumping station will be moved 1,500 ft to the east behind topographic screening.

Effectiveness: Relocation of the proposed facility will allow for natural topographic screening thereby improving the future visual condition from the "visual disturbance" (FVC IV) to "unnoticed alterations" (FVC II).

Application: This measure will be applied to the Celeron/All American proposal.

4.10.13 Noise

Because of the short duration of constructed impacts in any one area (2 weeks or less), limiting construction to daytime hours (as described in the Project Description), and the low probability of accomplishing effective mitigation of high noise levels associated with construction activities, mitigation beyond the standard requirements for use of equipment mufflers and similar OSHA requirements is not considered to be warranted.

Measure 34: The Gaviota pump station(s) will be shielded from Vista del Mar Union School by a noise barrier, such as a berm or structural enclosure.

Effectiveness: The barrier will be designed and built to reduce project operation related noise below the 60 dBA significance threshold of the school.

Application: This measure will apply to any pump station built by Celeron/All American or Getty within 1,500 ft of the Vista del Mar Union School.

4.10.14 Oil Spills (none required)

4.11 Unavoidable Adverse Impacts

Implementation of the mitigation measures presented above that have been committed to by the California State Lands Commission, BLM, Santa Barbara County, and the Forest Service would reduce the impacts associated with the Celeron/All American and Getty proposals and the routing alternatives. Those significant impacts that would remain following mitigation (i.e., unavoidable adverse impacts) are described below for each proposal and alternative.

Celeron/All American and Getty Proposals

Air Quality

- No significant impacts.

Geology

- No significant impacts (geologic hazards and risks are described in Chapter 4).

Soils

- Major oil spills or leaks would contaminate soil affecting erosion rates, water uptake, and productivity. The following agricultural lands would be most sensitive to oil spills: southwestern Kern County and Cuyama Valley (Celeron and Getty routes, Las Flores to Emidio segment); Barstow and Blythe (All American route, Emidio to Blythe segment); and Deming Rainbow

Valley, Gila River Valley, and Rio Grande Valley (All American route, Blythe to McCamey segment).

Surface Water

- Major oil spills or leaks would degrade water quality below federal and state standards. Impacts would occur at and downstream from any stream crossing (Celeron/All American and Getty routes).

- Alteration of channel geometry would cause degradation in La Brea Creek during and after construction (Getty route, Las Flores to Emidio segment).

- Channel degradation could result in exposure of the pipeline and increase the possibility of an oil spill (Celeron and Getty routes, Las Flores to Emidio segment).

Groundwater

- Major oil spills or leaks would degrade water quality below federal and state standards. Sensitive groundwater basins include the Santa Ynez, Sisquoc, Cuyama, and San Antonio (Celeron and Getty routes, Las Flores to Emidio segment); Mojave River at Barstow (All American route, Emidio to Blythe segment); and La Posa, Centennial Area, Lower Santa Cruz, San Pedro River, Sulphur Springs Valley, San Simon, Animas/Lordsburg, Mimbres Valley, Rio Grande Valley, and Pecos River Valley (All American route, Blythe to McCamey segment).

Aquatic Biology

- Major oil spills or leaks would degrade water quality and aquatic habitats and exceed toxic levels for some early life stages of important fish species. Important permanent fish populations could be measurably affected in Refugio Creek (Celeron route) and Gaviota Creek (Celeron and Getty routes) in the Celeron and Getty Las Flores to Emidio segment; the Colorado River (All American route, Emidio to Blythe segment); and Bass Canyon Creek, Hot Springs Creek, Colorado, Gila, Rio Grande, and Pecos Rivers (All American route, Blythe to McCamey segment).

- Major oil spills or leaks in coastal streams along the Celeron route (Las Flores Canyon to Gaviota Creek) and Getty route at Gaviota Creek could adversely affect nearshore marine communities and affect the endangered tidewater goby in Gaviota Creek.

Terrestrial Biology:

- Loss of 34 acres of live oaks and riparian habitat in La Brea Canyon during construction for the Getty route (Las Flores to Emidio segment); and 31 acres of live oak and riparian habitat along the Celeron/All American route.

- Loss of individuals of three rare plant species (Hoffman's nightshade, Refugio manzanita, and Catalina mariposa) during construction in Gaviota Pass (Getty route, Las Flores to Emidio segment).

- Loss of individuals of four sensitive plant species (Barstow woolly sunflower, Comanche layia, Calico monkey flower, and Crucifixion thorn) would be removed during construction (All American route, Emidio to Blythe segment).

- Loss of 1,425 acres of Mojave desert creosote scrubland and habitat for up to 70 years (All American route, Emidio to Blythe segment).

- Loss of 88 acres and 138 acres of oak woodland along the Getty and Celeron/All American pipeline routes, Las Flores to Emidio segment.

- Loss of San Joaquin kit fox, blunt-nosed leopard lizard, San Joaquin antelope squirrel, and giant kangaroo rat habitat in the Cuyama Valley during construction (Celeron and Getty routes, Las Flores to Emidio segment).

- Up to 230 desert tortoises (a federal candidate threatened animal) would be killed and their habitat affected by pipeline construction across the Mojave Desert (All American route, Emidio to Blythe segment).

- Disturbance during construction to desert bighorn sheep lambing and watering in Dome Rock Mountains (All American route, Blythe to McCamey segment).

- Major oil spills or leaks could remove sensitive wildlife habitat for the following species: blunt-nosed leopard lizard, San Joaquin antelope squirrel, and giant kangaroo rat in the Cuyama Valley (Celeron and Getty routes, Las Flores to Emidio segment); Mojave ground squirrel and Tehachapi slender salamander in the Tehachapi Mountains (All American route, Emidio to Blythe segment), and waterfowl and Yuma clapper rail in wetlands below the Colorado River crossing (All American route, Emidio to Blythe segment).

Socioeconomics

- No significant impacts.

Land Use and Recreation

- The pipelines may not be in conformance with the Santa Barbara County Local Coastal Plan, and would not be in conformance with the Riverside County Comprehensive Plan; and BLM California Desert Conservation Area Plan (All American route, Emidio to Blythe segment).

- Crossing the Kofa NWR may be judged incompatible with refuge plans (All American route, Blythe to McCamey segment).

- Quality of recreational activities would decrease during construction in the following areas: Gaviota Pass Roadside Rest area (Getty route, Las Flores to Emidio segment); La Brea Canyon (Celeron and Getty routes, Las Flores to Emidio segment); Kofa NWR (All American route, Blythe to McCamey segment).

- Three (Celeron) or two (Getty) FPAs (Rare II) would be affected in the LPNF (Celeron and Getty routes, Las Flores to Emidio segment).

- Major spills into coastal streams from Las Flores to Gaviota Creek would significantly affect beaches and water-oriented recreational opportunities (Celeron and Getty routes, Las Flores to Emidio segment). Other important water sport recreation areas include the Colorado, Gila, Rio Grande, and Pecos Rivers (All American route, Blythe to McCamey segment).

Transportation

- No significant impacts.

Cultural Resources

- Implementation of the cultural resources compliance plan would avoid most significant adverse impacts to cultural resources; however, it may not be possible to mitigate all impacts. National Register eligible sites identfied during the Class III survey would be avoided wherever possible. Where such sites can not be avoided and must be salvaged, a certain amount of cultural resources information would be unavoidably lost. Additionally, impacts to Native American concerns are often difficult to mitigate and may be unavoidable. A final determination of unavoidable adverse impacts to cultural resources would not be made until after the Class III survey has been completed and site-specific mitigation measures have been developed (Celeron/All American and Getty routes).

Scenic/Visual Resources

- Significant visual changes along the pipeline corridors in LPNF (Celeron and Getty routes, Las Flores to Emidio segment).

- Significant visual changes at the Twelve-Gauge Lake pump station site and the Cadiz tank farm site (All American route, Emidio to Blythe segment).

Noise

- Estimated noise emissions would exceed a day-night average sound pressure level of 60 dBA (California standard) during construction at the following locations: Vista del Mar school at Gaviota, Buellton, and individual residences (Celeron and Getty routes, Las Flores to Emidio segment); North Edwards, Desert Lake, Boron, Kramer Junction, Barstow, California State Women's Prison, and scattered subdivisions and residences (All American route, Emidio to Blythe segment); and residential areas in Pinal County, Arizona; Lordsburg and Deming, New Mexico; and Wink, Monahans, Crane, and McCamey, Texas (All American route, Blythe to McCamey segment).

- No significant noise impacts would occur during operation.

System Safety and Reliability

- The Celeron/All American and Getty proposals comply with all applicable codes, regulations, standards, and generally accepted industry practices.

Oil Spill Potential:

- Probabilities of spills greater than 50 barrels for a new pipeline would be 0.04 spills/year for the Celeron and Getty (Las Flores to Emidio) segments, and 0.33 spills/year for the All American segment; (overall length probability of 0.0003 spills/ year/pipeline mile for all segments).

- Probabilities of spills greater than 9.5 barrels for new pipeline would be 0.08 spills/year for the Celeron and Getty (Las Flores to Emidio) segments, and 0.76 spills/year for the All American segment; (overall length probability of 0.0007 spills/year/pipeline mile for all segments).

- Probabilities of spills greater than 50 barrels for 20-year old pipeline would be 0.11 spills/year for the Celeron and Getty (Las Flores to Emidio segments), and 0.98 spills/year for the All American segment; (overall length probability of 0.0009 spills/year/pipeline mile for all segments).

- Probabilities of spills greater than 9.5 barrels for 20-year old pipeline would be 0.22 spills/year for the Celeron and Getty (Las Flores to Emidio) segments, and 1.95 spills/year for the All American segment; (overall length probability of 0.0018 spills/year/pipeline mile for all segments).

- Probabilities of spills greater than 50 barrels for 40-year old pipeline would be 0.28 spills/year for the Celeron and Getty (Las Flores to Emidio segments), and 2.49 spills/year for the All American segment; (overall length probability of 0.0023 spills/year/pipeline mile for all segments).

- Probabilities of spills greater than 9.5 barrels for 40-year old pipeline would be 0.54 spills/year for the Celeron and Getty (Las Flores to Emidio segments), and 4.88 spills/year for the All American segment; (overall length); probability of 0.0045 spills/year/pipeline mile for all routes).

- Probabilities of tank farm spills during the 30-year life of project would be 11.4 spills equal to or greater than 10 barrels, 2.58 spills equal to or greater than 100 barrels, and 0.225 spills equal to or greater than 1,000 barrels (All American route, Emidio to Blythe segment).

Santa Maria Canyon Alternative

Air Quality

- No significant impacts.

Geology

- No significant impacts (geologic hazards and risks are described in Chapter 4).

Soils

- Major oil spills or leaks would contaminate soil affecting erosion rates, water uptake, and productivity. Small areas of agricultural lands, located primarily in the Sisquoc Valley, would be the most sensitive soils.

Surface Water

- Major oil spills or leaks would degrade water quality below federal and state standards. Impacts would occur at and downstream from any stream crossing.

Groundwater

- No significant impacts.

Aquatic Biology

- No significant impacts.

Terrestrial Biology

- Loss of about 63 acres of oak woodlands along Getty's route (50-ft ROW) and 126 acres along the Celeron/All American route (100-ft ROW) during construction.

- Loss of about 10 acres of riparian vegetation along Tepusquet Creek along Getty's pipeline route (50-ft ROW), and 10 acres along Celeron/All American's route (assuming 50-ft ROW as mitigation).

Socioeconomics

- No significant impacts.

Land Use and Recreation

- No significant impacts.

Transportation

- No significant impacts.

Cultural Resources

- See the Celeron/All American and Getty proposals.

Visual Resources

- Significant visual changes would occur in LPNF because of clearing.

Noise

- Estimated noise emissions would exceed a day-night average sound pressure level of 60 dBA during construction near residences along the Sisquoc River, at the mouth of Tepusquet Canyon, and along the Cuyama River.

System Safety and Reliability

- No significant impacts.

Oil Spill Potential

- Probabilities of oil spills would be similar to values estimated for the Celeron and Getty proposals (Las Flores to Emidio segment).

Desert Plan Utility Corridor Alternative

Air Quality

- No significant impacts.

Geology

- No significant impacts (geologic hazards and risks described in Chapter 4).

Soils

- Major oil spills or leaks would contaminate soil affecting erosion rates, water untake, and productivity. No agricultural lands occur along this route.

Surface Water

- Since no perennial streams would be crossed, no significant impacts are expected to occur.

Groundwater

- No significant impacts.

Aquatic Biology

- No significant impacts.

Terrestrial Biology

- Loss of individual desert tortoises in the Fenner-Chemhuevi Valley.

- Loss of 2,350 acres of creosote scrubland and wildlife habitat for up to 70 years.

Socioeconomics

- No significant impacts.

Land Use and Recreation

- The corridor crosses the BLM Coxcomb Mountains WSA.

- ROW would provide access to a BLM Area of Critical Environmental Concern near Granite Pass.

Transportation

- No significant impacts.

Cultural Resources

- See the Celeron/All American and Getty proposals.

Visual Resources

- No unavoidable significant impacts.

Noise

- No significant impacts.

System Safety and Reliability

- No significant impacts.

Oil Spill Potential

- Probabilities of spills greater than 50 barrels would be 0.06 spills/year for a new pipeline, 0.17 spills/year for a 20-year old pipeline, and 0.44 spills/year for a 40-year old pipeline.

- Probabilities of tank farm spills during the 30-year life of project would be 11.4 spills equal to or greater than 10 barrels, 2.58 spills equal to or greater than 100 barrels, and 0.225 spills equal to or greater than 1,000 barrels.

<u>Brenda Alternative</u>

Air Quality

- No significant impacts.

Geology

- No significant impacts.

Soils

- Major oil spills or leaks would contaminate soil affecting erosion rates, water uptake, and productivity. No agricultural lands occur along this route.

Surface Water

- No significant impacts.

Groundwater

- A sensitive groundwater basin (La Posa) south of Quartzsite would be crossed and could be affected by a major oil spill or leak.

Aquatic Biology

- No significant impacts.

Terrestrial Biology

- No significant impacts.

Socioeconomics

- No significant impacts.

Land Use and Recreation

- No significant impacts.

Transportation

- No significant impacts.

Cultural Resources

- See the Celeron/All American and Getty proposals.

Visual Resources

- No significant impacts.

Noise

- Estimated noise emissions would exceed a day-night average sound pressure level of 60 dBA during construction near residences south of Quartzsite.

System Safety and Reliability

- No significant impacts.

Oil Spill Potential

- Probabilities of spills would be similar to values estimated for All American's proposal.

McCamey to Freeport Alternative

Air Quality

- No significant impacts.

Geology

- No significant impacts (geologic hazards and risks are described in Chapter 4).

Soils

- Major oil spills or leaks would contaminate soil affecting erosion rates, water uptake, and productivity. Agricultural lands along the eastern portion of the alternative would be most sensitive to oil spills.

Surface Water

- Major oil spills or leaks would degrade water quality below federal and state standards. Impacts would occur at and downstream from any stream crossing.

Groundwater

- Major oil spills or leaks would degrade water quality below federal and state standards. Sensitive groundwater basins occur on the Edwards Plateau and the Gulf Coastal Plain.

Aquatic Biology

- Major oil spills or leaks would degrade water quality and aquatic habitats and exceed toxic levels for some early life stages of important freshwater, brackish water, and saltwater invertebrate and fish species. Important species include shrimp, oysters and blue crabs. Seventeen perennial streams that could contain sensitive fish species would be crossed by the alternative.

Terrestrial Biology

- Major oil spills or leaks in riparian or wetland areas would significantly impact both terrestrial and aquatic species and their habitats.

Socioeconomics

- No significant impacts with the exception of potential oil spill impacts on commercial fisheries, especially shrimp.

Land Use and Recreation

- Potential oil spill impacts on sport fin and shell fish and public beaches

Transportation

- No significant impacts

Cultural Resources

- See the Celeron/All American and Getty proposals.

Visual Resources

- No significant impacts.

Noise

- Estimated noise emissions would exceed a day-night average sound pressure level of 60 dBA during construction near residences along the alternative pipeline route.

Systems Safety and Reliability

- No significant impacts.

Oil Spill Potential

- Probabilities of spills greater than 50 barrels would be 0.14 spills/year for a new pipeline, 0.41 spills/year for a 10-year old pipeline, and 1.06 spills/year for a 40-year oil pipeline.

4.12 Relationship Between Local Short-Term Uses of Man's Environment and the Maintenance and Enhancement of Long-Term Productivity

Short term is defined as the construction period of the Celeron/All American and Getty projects plus one year for ROW rehabilitation. Long term is defined as the remaining life of the project through abandonment and reclamation. Following completion of project construction and rehabilitation of the ROWs, no significant decreases in the productivity of the project area are expected.

Many of the significant impacts associated with the Celeron/All American and Getty pipelines would be short term and would cease to be significant following ROW rehabilitation. A summary of short-term and long-term impacts is presented in Tables 4-33 and 4-34.

4.13 Irreversible/Irretrievable Commitment of Resources

Construction and operation of the Celeron/All American and Getty Pipeline Projects and all alternatives could result in either the irreversible or irretrievable commitment of certain resources. An irreversible commitment of a resource is one which cannot be changed once it occurs; an irretrievable commitment means that the resource cannot be recovered or reused. Irreversible and irretrievable impacts are summarized in Table 4-33 and 4-34. No resources will be over committed by the construction on operation of either project.

4.14 Growth-Inducing Impacts of the Project

Due to the character of the Celeron/All American and Getty pipeline projects, the size of the work force, and the short-term duration of project construction, no significant growth-inducing impacts are foreseen. Adequate housing and public facilities and services are currently available to accommodate the construction and operations work force along the majority of the pipeline route. Temporary impacts would not be significant enough to require major capital improvements, which might induce growth in an area.

The Celeron/All American pipeline would allow the transportation of Alaskan crude oil to eastern refineries; however, this is not expected to induce the growth of these refineries as unused refining capacity currently exists. Similarly, the construction of a new refinery in the Phoenix area (the Provident refinery) has been discussed for several years. The Celeron/All American pipeline would be approximately 30 miles south of Phoenix and could serve as a source of crude oil for such a refinery. However, the existing oversupply of refining capacity in the Gulf states and the large capital investment involved makes the construction of a new refinery unlikely. Thus, growth-inducing impacts are not anticipated at this time.

TABLE 4-33

SHORT-TERM AND LONG-TERM IMPACTS RESULTING FROM THE CELERON/ALL AMERICAN PROPOSAL OR ALTERNATIVES

Resource	Irreversible Impacts	Irretrievable Impacts	Relationship of Short-Term Use of Environment and Long-Term Productivity
Air Quality	no	no	The project would not significantly deteriorate existing air quality in the project area.
Geology	no	no	No significant short-term or long-term impacts are anticipated.
Soils	no	no	During construction there would be short-term losses of soil due to erosion; no significant long-term impacts to soils are anticipated.
Surface Water	no	no	There would be short-term impacts to surface water during construction; no significant long-term impacts are anticipated.
Groundwater	no	no	No significant short-term or long-term impacts are anticipated
Aquatic Biology	no	no	Short-term impacts such as substrate removal, increased sedimentation, and habitat alteration would occur during construction; no significant long-term impacts are anticipated.
Terrestrial Biology	no	yes	The losses of live oak trees and up to 230 desert tortoises would be irretrievable. All vegetation types crossed by the pipeline would suffer short-term impacts. Oak woodlands and desert scrubland would not regenerate within the life of the project (30 years) and would suffer long-term impacts.
Socioeconomics	no	no	In the short-term, construction of the project would provide direct employment for 1,954 workers in 1985 and result in increased spending in local areas. Temporary housing demand would exceed supply in certain areas during pipeline construction. In the long-term, operations would employ 49 workers and increased property tax revenues would be realized by the counties crossed by the pipeline.
Land Use and Recreation	yes	yes	Short-term disruptions of agriculture and recreation activities would occur. These losses would be irretrievable. Long-term degradation of wilderness values would occur in the FPAs and WSAs crossed by the proposed pipeline or alternatives. This degradation would be irreversible.
Transportation	no	no	There would be no significant short-term or long-term impacts to transportation.
Cultural Resources	yes	yes	Additional information gained during project-related surveys for cultural resource sites would contribute to knowledge of the area's history. Disturbance of cultural resource sites could result in the permanent loss of data.
Visual Resources	no	yes	Short-term impacts to visual resources would occur during construction of the pipeline and the pump stations. Long-term impacts would occur in the PNF, at the Cadiz pump station/tank farm site, and at the Twelve-Gauge Lake pump station.
Noise	no	no	Short-term noise impacts would occur to nearby residences during pipeline construction. There would be no significant long-term impacts.

TABLE 4-33 (CONTINUED)

Resource	Irreversible Impacts	Irretrievable Impacts	Relationship of Short-Term Use of Environment and Long-Term Productivity
Oil Spills	yes[1]	yes[1]	A major oil spill could potentially occur during pipeline operation. Effects to sensitive resources could last from a few months to several years.

[1]In the event of a major oil spill, an irreversible and/or irretrievable commitment of resources could occur to the following resources: soils, surface water, groundwater, aquatic biology, terrestrial biology, and land use and recreation.

TABLE 4-34

SHORT-TERM AND LONG-TERM IMPACTS RESULTING FROM THE GETTY PROPOSAL OR ALTERNATIVES

Resource	Irreversible Impacts	Irretrievable Impacts	Relationship of Short-Term Use of Environment and Long-Term Productivity
Air Quality	no	no	The project would not significantly deteriorate existing air quality in the project area.
Geology	no	no	No significant short-term or long-term impacts are anticipated.
Soils	no	no	During construction there would be short-term losses of soil due to erosion; no significant long-term impacts to soils are anticipated.
Surface Water	yes	yes	There would be short-term impacts to surface water during construction. Construction in La Brea Canyon would disturb a large part of the La Brea Creek stream channel. The stream would probably not recover within the life of the project.
Groundwater	no	no	No significant short-term or long-term impacts are anticipated
Aquatic Biology	no	no	Short-term impacts such as substrate removal, increased sedimentation, and habitat alteration would occur during construction; no significant long-term impacts are anticipated.
Terrestrial Biology	no	yes	The loss of live oak trees would be irretrievable. All vegetation types crossed by the pipeline would suffer short-term impacts. Oak woodlands would not regenerate within the life of the project (30 years) and would suffer long-term impacts.
Socioeconomics	no	no	In the short-term, construction of the project would provide direct employment for 168 workers in 1985 and result in increased spending in local areas. In the long-term, operations would employ 5 workers and increased property tax revenues would be realized by the counties crossed by the pipeline.
Land Use and Recreation	yes	yes	Short-term disruptions of agriculture and recreation activities would occur. These losses would be irretrievable. Long-term degradation of wilderness values would occur in the FPAs crossed by the pipeline. This degradation would be irreversible.
Transportation	no	no	There would be no significant short-term or long-term impacts to transportation.
Cultural Resources	yes	yes	Additional information gained during project-related surveys for cultural resource sites would contribute to knowledge of the area's history. Disturbance of cultural resource sites could result in the permanent loss of data.
Visual Resources	no	yes	Short-term impacts to visual resources would occur during construction of the pipeline. Long-term impacts would occur in the PNF.
Noise	no	no	Short-term noise impacts would occur to nearby residences during pipeline construction. There would be no significant long-term impacts.

TABLE 4-34 (CONTINUED)

Resource	Irreversible Impacts	Irretrievable Impacts	Relationship of Short-Term Use of Environment and Long-Term Productivity
Oil Spills	yes[1]	yes[1]	A major oil spill could potentially occur during pipeline operation. Effects to sensitive resources could last from a few months to several years.

[1]In the event of a major oil spill, an irreversible and/or irretrievable commitment of resources could occur to the following resources: soils, surface water, groundwater, aquatic biology, terrestrial biology, and land use and recreation.

5.0 CONSULTATION AND COORDINATION

5.0 CONSULTATION AND COORDINATION

Public Involvement

In the course of preparation of the draft EIR/EIS for the Celeron/ All American and Getty Pipeline Projects, the joint lead agencies (California State Lands Commission and BLM) have communicated with and received input from many Federal, state, and local agencies; elected representatives; environmental and citizens groups; industries; and individuals. Many of these people participated in the public scoping meetings which were held in San Bernardino, CA - November 29, 1983; Phoenix, AZ - November 30, 1983; Tucson, AZ - December 1, 1983; Las Cruces, NM - December 2, 1983; Bakersfield, CA - December 5, 1983; Santa Maria, CA - December 19, 1983; Santa Barbara, CA - December 19, 1983. The following agencies, groups, and individuals have provided input and/or will receive copies of the draft report.

Federal Agencies

Advisory Council on Historic Preservation
Department of Agriculture
- Forest Service
- Soil Conservation Service

Department of the Army
- Corps of Engineers
- Edwards Military Base
- Fort Bliss Military Base
- Nebo Supply Base
- Yuma Proving Ground
- Coast Guard

Department of Commerce
- National Oceanic and Atmospheric Administration

Department of Energy
Department of Housing and Urban Development
Department of the Interior
- Bureau of Indian Affairs
- Bureau of Mines
- Bureau of Reclamation
- Fish and Wildlife Service
- Geological Survey
- National Park Service
- Office of Environmental Project Review

Department of Transportation
- Federal Highway Administration
- Federal Railroad Administration
- Research and Special Programs Adminstrations
- Secretary's Regional Representatives:
  - San Francisco
  - Fort Worth

Environmental Protection Agency

Federal Energy Regulatory Commission
International Boundaries Commission
Interstate Commerce Commission

State Agencies

Arizona:

- Bureau of Mines
- Commission of Agriculture & Horticulture
- Department of Health Services
- Department of Transportation
- Game & Fish
- Governors Commission on Arizona Environment
- Indian Affairs Commission
- Office of the Governor
- Natural Resource Department
- State Historic Preservation Office
- State Lands Department
- State Parks

California:

- Air Resources Board
- Coastal Commission
- Caltrans
- Department of Boating & Waterways
- Department of Conservation
- Department of Fish & Game
- Department of Forestry
- Department of Health
- Department of Parks and Recreation
- Department of Water Resources
- Energy Commission
- Native American Heritage Commission
- Office of Planning and Research
- Public Utilities Commission
- Regional Water Quality Control Board:
  - Central Coast Region 3
  - Central Valley Region 5
  - Colorado River Basin Region 7
  - Lahonton Region 6
- Secretary of Environmental Affairs
- State Historic Preservation Office
- State Water Resources Control Board

New Mexico:

- Corporation Commission
- Department of Agriculture
- Department of Finance and Administration
- Department of Game and Fish

Energy and Minerals Department
Environmental Improvement Division
Governor's Budget and Planning Office
Highway Department
Natural Resources Department
Office of the Governor
State Historic Preservation Office
State Lands Office

Texas:

County Courthouse for:
- El Paso County
- Hudspeth County
- Culbertson County
- Reeves County
- Loving County
- Winkler County
- Pecos County
- Crockett County
- Sutton County
- Kimble County
- Gillespie County
- Blanco County
- Hogs County
- Caldwell County
- Gonzales County
- LaVaca County
- Colorado County
- Wharton County
- Matagorda County
- Brazoria County

Department of Health
Department of Highways and Public Transportation:
Districts 6, 7, 12, 13, 14, & 24
General Lands Office
Office of the Governor
Parks and Wildlife Department
Railroad Commission of Texas
State Historic Preservation Office

Tribal Governments

AkChin Indian Council, AZ
Brotherhood of Tomol
Chemehuevi Indian Reservation, CA
Colorado River Indian Tribes, AZ
Fort Mojave Indian Reservation, CA
Fort Yuma River (Quechan Indian Nation), AZ
Gila River Indian Community, AZ
Kern Valley Indian Community, CA
Lone Pine Band of Paiute Shoshone, CA

Morange, CA
Papago Agency, AZ
San Carlos Apache Tribe, AZ
San Manuel Indian Reservation, CA
Santa Ynez Band of Chumash, CA
The Salt River Pima-Maricopa Indian Community, AZ
Tigua Indian Reservation, TX
United Chumash Council, CA

Local Agencies

Arizona:

- Central Arizona Association of Governments
- Coronado RC&D
- County Board of Supervisors (for all counties)
- District 4 Council of Governments
- Graham County Engineer
- La Paz County Board of Commissioners
- La Paz County Planning & Zoning Director
- Maricopa Assoc. of Governments
- Maricopa County Department of Planning & Development
- Mayor, City of Willox
- Mayor, Town of Hayden
- Mayor, Town of Winkelman
- S.E. Arizona Governments Organization

California:

- Air Pollution Districts:
  - Regional (San Luis Obispo) APCD
  - Kern County APCD
  - Santa Barbara County APCD
  - South Coast AQMD

- Baker Community Service District
- Board of Supervisors:
  - Kern County
  - Riverside County
  - San Bernardino County
  - San Luis Obispo
  - Santa Barbara

Office of the Mayor:
- Barstow
- Blythe
- Lancaster
- Needles
- Victorville
- Planning Department (for affected counties)
- Santa Barbara Co. Resource Management Department

New Mexico:

- County Commissioners:
  - Dona Ana County
  - Grant County
  - Hidalgo County
  - Luna County
- County Planning Department:
  - Dona Ana County
  - Grant County
  - Hidalgo County
  - Luna County
- Mayor, City of:
  - Deming
  - Lordsburg
- Southern Rio Grande Council of Governments
- Southwest New Mexico Council of Governments
- Southwest New Mexico RC&D
- Southwest New Mexico Resource Conservation District

Texas:

- City-County Building, El Paso
- County Courthouse:
  - Ector County
  - Midland County
  - Upton County
  - Ward County
- El Paso County Commissioners
- Permian Basin Regional Planning Commission
- West Texas Council of Governments

<u>U.S. Senators and Representatives, and State Legislators for</u>:

- Arizona
- California
- New Mexico
- Texas

<u>Environmental Groups/Organizations</u>

- American Mining Congress
- American Rivers Conservation Council
- American Wilderness Alliance
- Arizona Cattle Growers Association
- Arizona Conservation Council
- Arizona Desert Bighorn Sheep Society
- Arizona Golden Eagles
- Arizona Mining Association
- Arizona Rough-riders
- Arizona State Association of 4-Wheel Drive Club
- Arizona Wildlife Federation

Citizens for Mojave National Park
Defenders of Wildlife
Desert Bighorn Council
Desert Protective Council
Desert Tortoise Council
El Paso Archaeological Society
El Paso-Trans Pecos Audubon Society
Environmental Defense Fund
Friends of the Earth
Izaak Walton League
League of Women Voters
Messilla Valley Audubon Society
National Audubon Society
National Parks and Conservation Association
National Public Lands Task Force
Natural Resources Defense Council
New Mexico Natural History Institute
Office of Arid Lands Studies
Public Lands Council
Sierra Club
Southern Arizona Environmental Council
Southern Arizona Hiking Club
Southwestern Environmental Service
Southwestern New Mexico Natural History Institute
The Nature Conservancy
Tucson Gem and Mineral Society
Tucson 4-Wheelers
Tucson Rod & Gun Club
Wilderness Society
Wildlife Management Institute
Wildlife Society

Industries and Individuals

(Detailed list available upon request from William Haigh, BLM, California Desert District, Riverside, CA)

Libraries:

Alvin Public Library - Brazoria, TX
Arizona State University Library - Tempe, AZ
Barstow Branch Library - Barstow, CA
California Polytechnic State University
California State Library - Sacramento, CA
Deming Public Library - Deming, NM
Denver Public Library - Denver, CO
Department of Library and Archives - Phoenix, AZ
Department of Library and Archives - Sacramento, CA
Edwards Branch Library - Edwards, CA
El Paso Public Library - El Paso, TX
Energy and Minerals Department Library - Sante Fe, NM
Gonzales Public Library - Gonzales, TX
Houston Public Library - Houston, TX

Indio Branch Library - Indio, CA
Johnson City Public Library - Johnson City, TX
Kern County Library - Bakersfield, CA
Long Beach Public Library - Long Beach, CA
Lordsburg-Hildalgo Library - Lordsburg, NM
Los Angeles Public Library - Los Angeles, CA
Mojave Branch Library - Mojave, CA
Needles Branch Library - Needles, CA
Nesbitt Memorial Library - Columbus, TX
New Mexico State Library - Santa Fe, NM
Oakland Public Library - Oakland, CA
Phoenix Public Library - Phoenix, AZ
Pioneer Memorial Library - Fredericksburg, TX
Pomona College Library - Claremont, CA
Reeves County Public Library - Pecos, TX
Ridgecrest Public Library - Ridgecrest, CA
Riverside Central Library - Riverside, CA
San Antonio College Library - San Antonio, TX
San Bernardino Central Library - San Bernardino, CA
San Bernardino County Library - San Bernardino, CA
San Diego Public Library - San Diego, CA
San Francisco Public Library - San Francisco, CA
Santa Maria Public Library - Santa Maria, CA
Santa Rosa Sonoma County Public Library - Santa Rosa, CA
Southern Methodost Fondren Library - Dallas, TX
Stanford University Library - Stanford, CA
Texas State Library, Public Services Department - Capital Station, TX
Thomas Branager Library - Las Cruces, NM
University of Arizona Library - Tucson, AZ
University of California Library:
- Berkeley
- Davis
- Irvine
- Los Angeles
- Riverside
- Santa Barbara
- Santa Cruz

University of Houston:
- School of Law Library - Houston, TX
- Victoria Campus Library - Victoria, TX

University of Texas:
- Carleton School of Law - Austin, TX
- Government Documents Department - San Antonio, TX
- Health and Science Center Library - Dallas, TX

Ventura County Library - Ventura, CA
Victorville Branch Library - Victorville, CA
Wharton County Public Library - Wharton, TX
Winkler County Public Library - Kermit, TX

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GLOSSARY

GLOSSARY

Absorption - Immobilization of a liquid contaminant due to filling interstices and capillary attraction in porous, unsaturated soil.

Adsorption - Immobilization of a liquid contaminant due to molecular attraction or ion exchange on the surface of soil particles.

Aggradation - A process of shifting equilibrium of stream deposition, with upbuilding approximately at grade.

Alluvial fan - The alluvial deposit of a stream where it issues from a gorge upon a plain or of a tributary stream at its junction with the main stream.

Alluvium - Clay, silt, sand, gravel, or similar detrital material deposited by running water.

Anadromous - Refers to fish that live in the ocean and ascend fresh-water streams to spawn.

Anticyclonic circulation - System of winds that rotates about a center of high atmospheric pressure clockwise in the northern hemisphere.

Aquifer - A water-bearing stratum of permeable rock, sand, or gravel.

Authorized Officer - Federal employee assigned the responsibility of overseeing compliance with ROW stipulations during pipeline construction and operation.

Bajada - Broad alluvial slope extending from the base of a mountain range out into a basin and formed by coalescence of separate alluvial fans.

Barrel - Measure of volume for oil; equals 42 US gallons.

Bedrock - Solid rock underlying unconsolidated surface materials.

Benthic - Of, relating to, or occurring at the bottom of a body of water.

Block valve - Pipeline valve designed to prevent the flow of oil in either direction. May be remotely or manually operated.

Caliche - Gravel, sand, or desert debris cemented by porous calcium carbonate.

Check valve - Pipeline valve designed to automatically prevent the backward flow of oil.

Climax - A relatively stable stage or community, especially plants, that is achieved through successful adjustment to an environment.

A-weighting - A weighting scheme applied to sound level measurements; corresponding approximately to human hearing sensitivity. Expressed as decibels, A-weighted (dBA).

CNEL - Community Noise Equivalent Level; similar to L_{dn} but with 5 dBA added to 7:00 P.M. to 10:00 P.M. average noise level and 10 dBA added to the 10:00 P.M. to 7:00 A.M. average noise level.

Colluvium - Rock and soil accumulation at the foot of a slope.

Debris flows - Mass movement of rock and/or mud down steep inclines in association with saturated soils.

Decibel - A unit for expressing the ratio of two amounts of sound power; equal to 10 times the logarithm of this ratio.

Ephemeral stream - A stream that flows only during and after a precipitation event.

g - Acceleration equal to the force of gravity, 32 feet/sec/sec.

Fossiliferous - Containing fossils.

Gavity, °API - A measure of the specific gravity of oil, the higher the number, the lighter the oil. Water has an API gravity of 10.

Herpetofauna - Organisms belonging to the classes Amphibia and Reptilia, i.e., amphibians and reptiles.

Horizontal acceleration - rate of change of horizontal ground movement usually expressed in terms of a multiple of acceleration due to gravity (g = 32 ft/sec/sec).

Immiscibility - Incapable of mixing or attaining homogeneity, as with oil and water.

Karst - Limestone region with many sinkholes, abrupt ridges, caverns, and underground streams.

L_{dn} - The day/night average sound level, defined as the 24-hour period L_{eq} with 10 dBA added to the nighttime average level, L_n.

Macrophytes - Aquatic macroscopic plants.

Mesic - Characterized by a moderate amount of moisture.

Metals (in oil) - Trace metals, such as vanadium and boron, found in crude oil that can shorten the life of catalysts used in the refining process.

Midden - A refuse pile associated with a cultural resource site.

Percolation - Gravity flow of groundwater through the pore spaces in rock or soil.

Perennial - Present at all seasons of the year.

Petroglyph - Pecked or incised figures or designs on boulders, rocks, outcroppings, or within rock shelters.

Pictograph - An ancient or prehistoric drawing or painting on a rock wall.

Playa - The flat-floored bottom of an undrained desert basin that at times becomes a shallow lake.

Pod - A rudely cylindrical mineral body that decreases at the ends like a cigar.

Radiation inversion - A temperature inversion produced by the cooling of the earth's surface and adjacent air occurring whenever the earth's surface suffers a net loss of heat due to terrestrial radiation.

Riparian - Refers to the area or zone along the banks of a stream or lake that is not covered by water.

Scarp - An escarpment, cliff, or steep slope along the margin of a plateau, mesa, terrace, or bench.

Seismotectonics - The conditions or study of movements in the earth's crust as they relate to earthquake occurrence.

Sleeping circle/rock rings - Rock features associated with temporary occupation, ritual, or storage.

Slumping - Land that exhibits a downward slide, usually in a backward rotating motion.

Soil liquefaction - A condition where soil strength is greatly reduced because of excessive pore water pressure buildup, especially in saturated sandy soils that are subject to compaction and remolding triggered by earthquake vibrations.

Soluble - Susceptible of being dissolved in a fluid.

Stratus clouds - Clouds of great horizontal extension.

Subsidence area - An area that has settled or sunk.

Subsidence inversion - A temperature inversion produced by the adabatic warming of a layer of decending air.

GLOSSARY (CONTINUED)

Successional - Pertaining to the directional change in the composition of an ecosystem as organisms, especially plants, respond to and modify the environment.

Synoptic conditions - Relating to meteorological conditions as they exist simultaneously over a broad area.

Tectonically - Relating to deformation of the earth's crust.

Viscosity (centistokes) - The viscosity of oil is measured in centistokes; water at 67°F has a viscosity of 1 centistoke.

Volatile - Readily vaporized at a relatively low temperature.

Wetlands - Lowlands covered with shallow and sometimes temporary or intermittent waters.

Zoned fault - State of California zoning designation. Fault areas of high potential surface fault rupture that require special study prior to human occupancy.

ACRONYMS AND ABBREVIATIONS

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ACEC - Area of Critical Environmental Concern
ACT - Applied Conservation Technology, Inc.
ADL - Arthur D. Little, Inc.
ANSI - American National Standards Institute
APCD - Air Pollution Control District
bbl - barrels
BEA - Bureau of Economic Analysis
BLM - Bureau of Land Management
BPD - barrels per day
CAAQS - California Ambient Air Quality Standards
CDMG - California Division of Mines and Geology
CEQA - California Environmental Quality Act
cfs - cubic feet per second
CNEL - Community Noise Equivalent Level
CO - carbon monoxide
CU - Construction and Use (Plan)
dB - decibels
dBA - decibels A-weighted
DOT - (U.S.) Department of Transportation
EDAC - Engineering Decision Analysis Company
EIR - Environmental Impact Report
EIS - Environmental Impact Statement
EPA - Environmental Protection Agency
ERT - Environmental Research & Technology, Inc.
ESA - ESA Geotechnical Consultants
EVC - existing visual condition
FPA - Further Planning Area
ft - feet
FVC - future visual condition
FWS - (U.S.) Fish and Wildlife Service
HC - hydrocarbons
hp - horsepower
JBA - Jack R. Benjamin & Associates
JRP - Joint Review Panel

JUMP - Joint Utilities Management Program

Kwh - kilowatt-hours

L_{dn} - day-night (average sound) level

LPNF - Los Padres National Forest

μg/l - micrograms per liter

$\mu g/m^3$ - micrograms per cubic meter

mg/l - milligrams per liter

NA - Nonattainment Area

NAAQS - National Ambient Air Quality Standards

NDE - Non Destructive Evaluation, Inc.

NEPA - National Environmental Policy Act

NFPA - National Fire Protection Association

NO_2 - nitrogen dioxide

NO_x - oxides of nitrogen

NOAA - National Oceanographic and Atmospheric Administration

NWR - National Wildlife Refuge

O_3 - ozone

OCS - Outer Continental Shelf

OIW - Oceanographic Institute of Washington

OPSO - Office of Pipeline Safety and Operations

ORV - off road vehicle

OSC - On-Scene Coordinator

OSHA - Occupational Safety and Health Administration

PADD - Petroleum Administration for Defense District

PIRS - Pollution Incident Reporting System

ppm - parts per million

PSD - Prevention of Significant Deterioration

ROS - Recreation Opportunity Spectrum

ROW - right-of-way

RTU - remote terminal unit

RVD - recreation visitor-days

SCAQMD - South Coast Air Quality Management District

SCE - Southern California Edison

SEDAB - Southeast Desert Air Basin

SHPO - State Historic Preservation Office

SLC - State Lands Commission

SO_2	- sulfur dioxide
SOA	- State Operating Authority
SPM	- Semi-primitive, motorized
TSP	- total suspended particles
USCG	- United States Coast Guard
VMC	- Visual Management Class
VQO	- Visual Quality Objective
WSA	- Wilderness Study Area

LIST OF PREPARERS

LIST OF PREPARERS FOR THE CELERON/ALL AMERICAN AND GETTY PIPELINE PROJECTS

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U.S. FOREST SERVICE		
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ENVIRONMENTAL RESEARCH & TECHNOLOGY, INC. (ERT)		
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Danny Kringel Technical Specialist	B.A. (Mathematics) University of Southern California 8 Years Professional Experience	Air Resources
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LIST OF PREPARERS FOR THE CELERON/ALL AMERICAN AND GETTY PIPELINE PROJECTS (CONTINUED)

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APPENDIX A

AIR QUALITY DATA, STANDARDS, AND METHODOLOGY

APPENDIX A

APPLICABLE AIR QUALITY STANDARDS AND REGULATIONS

The National Ambient Air Quality Standards (NAAQS) and the California Ambient Air Quality Standards are shown in Table A-1. State ambient air quality standards in Arizona and Texas are identical to the NAAQS. The New Mexico ambient standards, which differ from the NAAQS, are shown in Table A-2.

The Federal Prevention of Significant Deterioration (PSD) increments for SO_2 and TSP are shown in Table A-3. The newly adopted air quality increments for Santa Barbara County are shown in Table A-4.

BASELINE AIR QUALITY

The relevant air quality data for 1980, 1981, and 1982 are summarized for Santa Barbara County, Kern County, and the Southeast Desert Air Basin of California in Tables A-5, A-6, and A-7, respectively. The stations shown are those nearest the pipeline route. Similar data for Arizona, New Mexico, and Texas are given in Tables A-8, A-9, and A-10, respectively. Discussion of the air quality data is contained in Section 3.2.1.2.

EMISSIONS INVENTORY

The emissions inventory was developed for the construction and operational phases of the Getty and Celeron/All American pipeline. Emissions were calculated for a team or spread which would construct a portion of the pipeline and were based upon equations in AP-42 and data supplied by Getty and All American.

The Getty pipeline was expected to use three spreads and the Celeron/All American pipeline was estimated to use five spreads. Since each spread was identical, construction emissions were calculated for one spread and assumed to be the same for the other spreads. Pollutants were assumed to be emitted from several types of sources. These included: emissions from heavy-duty construction equipment, secondary emissions from passenger vehicles for transportation of workers to the site, dust and smoke from brush clearing and burning, and fugitive dust from the disturbed areas along the site.

Operational emissions consisted of pollutants being emitted from natural gas-fired heaters, gas-fired turbine compressors, and the oil storage tank farm in Cadiz, California. The data supplied by All American was used to calculate the emissions from the operation of the pipeline based upon emission factors found in AP-42. Table A-11 presents the breakdown of emissions for both the construction and operational phases of the project.

MODELING METHODOLOGY

In order to calculate maximum project concentrations from the construction phase of the pipeline, the Industrial Source Complex (ISC) model was used. This model was selected because it was able to simulate a line source that was most appropriate for the construction phase. The construction emissions were spread over a 5-mile by 100-ft rectangle. Receptors were placed along the pipeline length every 100 meters downwind from the line source. Only short-term concentrations were calculated since construction occurs for a relatively short period of time at any location. Only 1-hour concentrations were calculated using the ISC model. Maximum 3-hour concentrations were computed by assuming the meteorological conditions associated with maximum 1-hour concentrations persisting for 3 hours. Maximum 8-hour and 24-hour concentrations were computed by assuming the maximum 1-hour concentration persisted for 6 hours and allowing the remainder of the hours to have no effect. Maximum ambient background concentrations were reviewed all along the pipeline and added to the maximum project concentrations to determine the maximum total ambient concentration. Table A-12 presents the assumed source and meteorological inputs used in the ISC modeling analysis.

If the near-field and in relatively smooth terrain, the COMPLEX I model was used to calculate maximum short-term concentrations from the operation of the proposed pipeline. Since no source configurations have been developed, all point sources at each station were conservatively assumed to be omitted from a single location. For each pumping/heating station, 1-hour concentrations were computed for a series of meteorological conditions in order to determine the 1-hour maximum concentration. The worst-case 3-hour concentration was determined by allowing the 1-hour concentration to persist for 3 hours. Maximum 8-hour concentrations were calculated for three scenarios. First, the maximum 1-hour concentration during unstable conditions was assumed to persist for 4-hours in the worst-case direction. The remaining hours were assumed to be from a direction that would have no effect on the concentration. Secondly, the maximum 1-hour neutral stability concentration was allowed to persist for 8 hours. Thirdly, the maximum 1-hour concentration during stable conditions persisted for 6 hours with the remaining hours having no effect. The maximum concentration from these three scenarios was assumed to be worst case. The maximum 24-hour concentration was determined using the same technique as in the 8-hour determination, with one exception. Neutral conditions were allowed to persist for 12 hours rather than 8 hours. As in the construction phase, maximum background values in the vicinity of each pumping station were obtained to determine total ambient concentrations. Table A-13 presents the inputs used to model the short-term worst-case impacts.

The Valley model was used to compute maximum short-term concentrations in complex terrain and annual concentrations. Short-term concentrations were modeled assuming stable conditions and allowing the plume to impact on surrounding high terrain. These results were then compared with the COMPLEX I results to determine maximum short-term concentrations. Table A-14 displays the model inputs used in the Valley modeling analysis. Upon examination of the source configuration and location with respect to the surrounding terrain features for each pumping station, the Gila pump station in Arizona was expected to produce the maximum annual NO_2 concentrations. The Tucson Star Windrose provided suitable meteorological data required by the model.

TABLE A-1

NATIONAL AND CALIFORNIA AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	California Standards[1,3,6]	National Standards[2]	
			Primary[3,4]	Secondary[3,5]
O_3	1-hour	0.10 ppm (200 µg/m³)	235 µg/m³ (0.12 ppm)	Same as Primary
CO	8-hour	9 ppm (10 mg/m³)	10 mg/m³ (9 ppm)	Same as Primary
	1-hour	20 ppm (23 mg/m³)	40 mg/m³ (35 ppm)	Same as Primary
NO_2	Annual average	NS[7]	100 µg/m³ (0.05 ppm)	Same as Primary
	1-hour	0.25 ppm (470 µg/m³)	NS	NS
SO_2	Annual average	NS	80 µg/m³ (0.03 ppm)	NS
	24-hour	0.05 ppm[8] (131 µg/m³)	365 µg/m³ (0.14 ppm)	NS
	3-hour	NS	NS	1,300 µg/m³
	1-hour	0.5 ppm (1,310 µg/m³)	NS	NS
TSP	Annual Geometric mean	60 µg/m³ (30 µg/m³)	75 µg/m³	60 µg/m³
(PM10)	24-hour	100 µg/m³ (50 µg/m³)	260 µg/m³	150 µg/m³
Sulfates	24-hour	25 µg/m³	NS	NS
Lead	30-day	1.5 µg/m³	NS	NS

TABLE A-1 (CONTINUED)

Pollutant	Averaging Time	California Standards[1,3,6]	National Standards[2]	
			Primary[3,4]	Secondary[3,5]
	Calendar quarter	NS	1.5 μg/m^3	NS
H_2S	1-hour	0.03 ppm (42 μg/m^3)	NS	NS
Ethylene	8-hour 1-hour	0.1 ppm 0.5 ppm	NS	NS
Visibility-Reducing Particles	One observation	In sufficient amounts to reduce the prevailing visibility to less than 70 percent		

Source: California Air Quality Data, Summary of Air Quality Data Gaseous and Particulate Pollutant, Annual Summary, Vol XII, 1980.

[1]California standards, other than CO, SO_2 (1-hour), and PM10, are values that are not to be equaled or exceeded. The CO, SO_2 (1-hour), and PM10 standards are not to be exceeded. PMID represent particulate matter less than 10μ in diameter.

[2]National standards, other than those based on annual averages or annual geometric means, are not to be exceeded more than once per year.

[3]Concentration is in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 mm of mercury. All measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 mm Hg (1,013.2 millibars). In this table, ppm refers to ppm by volume, or micromoles of pollutant/mole of gas.

[4]The levels of air quality necessary, with an adequate margin of safety, to protect public health. Each state must attain the primary standards no later than 3 years after the state implementation plan is approved by EPA.

[5]The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant. Each state must attain the secondary standards within a "reasonable time" after the implementation plan is approved by the EPA.

[6]Prevailing visibility is defined as the greatest visibility attained or surpassed around at least half of the horizon circle, but not necessarily in continous sectors.

[7]NS = No Standard

[8]This state standard is violated if there is also a simultaneous violation of the state 1-hour oxidant standard or the state 24-hour suspended particulate matter standards.

TABLE A-2

NEW MEXICO AIR QUALITY STANDARDS

	New Mexico Standard	Federal Standards	
		Primary	Secondary
TSP			
24-hour average	150 μg/m³	260 μg/m³	150 μg/m³
Annual geometric mean	60 μg/m³	74 μg/m³	60 μg/m³
SO_2			
24-hour average	0.10 ppm (260 μg/m³)	0.14 ppm	NS
Annual arithmetic mean	0.02 ppm (52 μg/m³)	0.03 ppm	NS
3-hour average	NS[1]	NS	0.50 ppm
CO			
8-hour average	8.7 ppm (9.7 mg/m³)	9 ppm	9 ppm
1-hour average	13.1 ppm (14.5 mg/m³)	35 ppm	35 ppm
O_3			
1-hour average	0.06 ppm (120 (μg/m³)	0.12 ppm	0.12 ppm
NO_2			
24-hour average	0.10 ppm (200 μg/m³)	NS	NS
Annual arithmetic mean	0.05 ppm (100 μg/m³)	0.05 ppm	0.05 ppm
Lead			
Calendar quarterly Arithmetic average	NS	1.50 μg/m³	NS

Source: Air Quality Bureau Annual Report, State of New Mexicio Health and Environmental Department, Environmental Improvement Division, 1981-1982.

[1]NS = No Standard

TABLE A-3

PSD INCREMENT CEILINGS

($\mu g/m^3$)

Pollutant and Averaging Time	Area Classification Class I	Class II
SO_2		
Annual	2	20
24-hour	5	91
3-hour	25	512
TSP		
Annual	5	19
24-hour	10	37

Source: EPA 40 CFR 52.21

TABLE A-4

SANTA BARBARA COUNTY RULE 205.C AIR QUALITY INCREMENTS

	Maximum Allowable Increase ($\mu g/m^3$)		Baseline Date	Air Quality Standard
	Class I	Class II		
CO:				
8-hour maximum	200	2,500	1/1/84	10,000
1-hour maximum	800	10,000		40,000
NO_2:				
Annual Arithmetic Mean	2	25	1/1/84	100
1-hour maximum	10	100		470
Reactive Organic Compounds				
3-hour maximum	3	40	1/1/84	160
Particulate Matter 10:				
24-hour maximum	2	12	1/1/84	50

Source: Santa Barbara County Air Pollution Control District, Air Quality Rules and Regulations, 1984.

TABLE A-5

SUMMARY OF RELEVANT SANTA BARBARA COUNTY AIR QUALITY DATA

Station	Year	O_3 (ppm) Maximum 1-Hour	O_3 (ppm) Mean Daily Maximum 1-Hour	NO_2 (ppm) Maximum 1-Hour	NO_2 (ppm) Annual Average	SO_2 (ppm) Maximum 1-Hour	SO_2 (ppm) Annual Average	TSP ($\mu g/m^3$) Maximum 24-Hour	TSP ($\mu g/m^3$) Annual Geometric Mean
El Capitan	1980	0.12	0.061	NA[1]	NA	0.01	0.000	302*	103
	1981	0.11	0.056	NA	NA	0.01	0.000	295	98
	1982	0.15	0.052	NA	NA	0.01	0.000	202	84
Santa Ynez	1980	0.09	0.039	NA	NA	NA	NA	NA	NA
	1981	0.11	0.048	NA	NA	NA	NA	NA	NA
	1982	0.11	0.053	NA	NA	NA	NA	NA	NA
Santa Maria	1980	0.09[2]	0.044	NA	NA	0.07[2]	0.002	293[4]	98
	1981	0.10[2]	0.043	0.04[3]	0.009	0.07[2]	0.002	416[4]	92
	1982	0.10[5]	0.031	0.05[3]	0.009	0.12[4]	0.001	260[4]	65
Maricopa	1981	NA	NA	NA	NA	NA	NA	187	64
	1982	NA	NA	NA	NA	NA	NA	106	27

Source: California Air Quality Data Summary of Air Quality Data Gaseous and Particulate Pollutants, Annual Summary, Vol. XII, 1980-1982.

Sampling Stations:

[1]Not Available

[2]East Main

[3]Glacier

[4]Library

[5]McClelland

*See note in Section 3.2.1.2 regarding El Capitan TSP.

TABLE A-6

SUMMARY OF RELEVANT KERN COUNTY AIR QUALITY DATA

		O_3 (ppm)		NO_2 (ppm)		SO_2 (ppm)		TSP (μg/m³)		CO (ppm)	
Station	Year	Maximum 1-Hour	Mean Daily Maximum 1-Hour	Maximum 1-Hour	Annual Average	Maximum 1-Hour	Annual Average	Maximum 24-Hour	Annual Geometric Mean	Maximum 1-Hour	Maximum 8-Hour
Bakersfield	1980	0.17[1]	0.057	0.13[1]	0.036	0.19[1]	0.033	470[1]	143	17.0	12.3
	1981	0.18[2]	0.069	0.16[1]	0.034	0.25[1]	0.010	405[1]	135	14.0	10.1
	1982	0.18[2]	0.058	0.11[1]	0.058	0.09[1]	0.006	250[1]	116	14.0	11.3
Taft	1980	NA[3]	NA	NA	NA	NA	NA	287	146	NA	NA
	1981	NA	NA	NA	NA	NA	NA	411	112	NA	NA
	1982	NA	NA	NA	NA	NA	NA	278	88	NA	NA

Source: California Air Quality Data Summary of Air Quality Data Gaseous and Particulate Pollutants, Annual Summary, Vol. XII, 1980-1982.

Sampling Stations:

[1]Chester

[2]Edison

[3]Not Available

TABLE A-7

SUMMARY OF RELEVANT AIR QUALITY DATA IN SOUTHEAST DESERT AIR BASIN

Station	Year	O_3 (ppm)		NO_2 (ppm)		TSP ($\mu g/m^3$)		CO (ppm)	
		Maximum 1-Hour	Mean Daily Maximum 1-Hour	Maximum 1-Hour	Annual Average	Maximum 24-Hour	Annual Geometric Mean	Maximum 1-Hour	Maximum 8-Hour
Barstow	1980	0.19	0.057	0.12	0.026	224	71	6.0	4.9
	1981	0.16	0.063	0.30	0.025	300	71	6.0	2.1
	1982	0.16	0.056	0.20	0.025	116	46	5.0	3.3
Twentynine Palms	1980	0.12	0.051	NA[1]	NA	244	50	8.0	7.8
	1981	0.15	0.060	NA	NA	160	53	8.0	7.3
	1982	0.13	0.062	NA	NA	96	41	3.0	1.8
Boron	1980	NA	NA	NA	NA	426	73	NA	NA
	1981	NA	NA	NA	NA	129	52	NA	NA
	1982	NA	NA	NA	NA	140	43	NA	NA
Mojave	1980	NA	NA	NA	NA	195	73	NA	NA
	1981	NA	NA	NA	NA	213	66	NA	NA
	1982	NA	NA	NA	NA	186	68	NA	NA

Source: California Air Quality Data Summary of Air Quality Data Gaseous and Particulate Pollutants, Annual Summary, Vol. XII, 1980-1982.

[1]Not Available

TABLE A-8

SUMMARY OF RELEVANT ARIZONA AIR QUALITY DATA

		O_3 (ppm)	NO_2 ($\mu m/m^3$)		SO_2 ($\mu g/m^3$)		TSP ($\mu g/m^3$)		CO ($\mu g/m^3$)	
Station	Year	Maximum 1-Hour	Maximum 24-Hour	Annual Average	Maximum 24-Hour	Annual Average	Maximum 24-Hour	Annual Average	Maximum 1-Hour	Maximum 8-Hour
Buckeye (Phoenix)[1]	1980	0.06 (0.11)	(324)	(75)	16	3	600	127	NA	NA
	1981	(0.05)	(176)	(75)	14	2	409	127	NA	NA
	1982	(0.03)	(141)	(67)	11	1	196	96	NA	NA
Coolidge	1980	0.07	86	10	22	1	220	87	NA	NA
	1981	NA[2]	40	13	74	4	253	92	NA	NA
	1982	NA	28	16	49	4	185	76	NA	NA
Maricopa	1980	0.05	94	10	NA	NA	219	55	6	1
	±981	NA	33	7	17	2	155	54	16	9
	1982	NA	19	7	32	3	110	54	NA	NA
Willcox	1980	NA	27	18	24	13	160	44	NA	NA
	1981	NA	NA	NA	NA	NA	NA	NA	NA	NA
	1982	NA	NA	NA	NA	NA	NA	NA	NA	NA

Source: 1982 Air Quality Control for Arizona, Arizona Department of Health Services 1982.

[1]The Phoenix E. Monroe station concentrations are given in brackets.

[2]Not Available

TABLE A-9

SUMMARY OF RELEVANT NEW MEXICO AIR QUALITY DATA

		O_3 (ppm)	NO_2 (ppm)		SO_2 (ppm)		TSP ($\mu g/m^3$)		CO (ppm)	
Station	Year	Maximum 1-Hour	Maximum 24-Hour	Annual Average	Maximum 24-Hour	Annual Average	Maximum 24-Hour	Annual Geometric Mean	Maximum 1-Hour	Maximum 8-Hour
Lordbury	1980	NA[1]	0.03	0.01	0.01	0.0	200	56	NA	NA
	1981	NA	0.02	0.01	0.01	0.0	110	62	NA	NA
	1982	NA	0.02	0.01	0.01	0.0	193	55	NA	NA
Denning	1980	NA	0.03	0.02	0.0	0.0	178	70	NA	NA
	1981	NA	0.02	0.02	0.01	0.0	134	70	NA	NA
	1982	NA	0.02	0.01	0.01	0.0	262	60	NA	NA
Anthony	1980	(0.10)[2]	0.03	0.01	0.0	0.0	391	114	(11.0)	(5.5)
	1981	(0.14)	0.04	0.01	0.01	0.0	470	122	NA	NA
	1982	(0.10)	0.02	0.01	0.01	0.0	369	107	NA	NA

Source: Air Quality Bureau Annual Report, State of New Mexico Health and Environmental Department, Environmental Improvement Division 1981-1982.

[1]Not Available

[2]()Las Cruces station (#6W) substituted for CO, La Union station (#60) for ozone.

TABLE A-10

SUMMARY OF RELEVANT TEXAS AIR QUALITY DATA

		O_3 (ppm)	NO_2 (ppm)		SO_2 (ppm)		TSP ($\mu g/m^3$)		CO (ppm)	
Station	Year	Maximum 1-Hour	Maximum 24-Hour	Annual Average	Maximum 24-Hour	Annual Average	Maximum 24-Hour	Annual Geometric Mean	Maximum 1-Hour	Maximum 8-Hour
Odessa	1980	0.11	NS[1]	0.01	0.01	0.00	201	58	18.3	9.4
	1981	0.10	NS	0.01	0.00	0.00	250	59	16.3	5.1
	1982	0.13	NS	0.01	0.01	0.00	402	71	5.5	NA[2]
San Antonio	1980	0.12	NS	0.02	0.01	0.00	188	98	18.5	10.1
	1981	0.14	NS	0.02	0.01	0.00	143	76	17.8	7.9
	1982	0.14	NS	0.01	0.01	0.00	217	112	13.9	7.9

Sources: Summary of Total Suspended Particulate Data, Texas Air Control Board 1980-1982.
Summary of Total Gaseous Pollutant Data Taxes Air Control Board 1980-1982.

[1]No standard in Texas.

[2]Not Available.

TABLE A-11

EMISSIONS INVENTORY FOR CONSTRUCTION AND OPERATION PHASES FOR THE GETTY AND CELERON/ALL AMERICAN PIPELINE

	Emissions (lb/day)				
	NO_x	SO_2	TSP	CO	HC
PIPELINE CONSTRUCTION[1]					
Celeron/All American					
Tractors	630.7	58.9	61.3	186.2	68.6
Graders	21.0	1.7	1.2	4.3	1.1
Misc. Equipment-Diesel	408.6	25.7	25.0	74.5	28.3
Misc. Equipment-Gasoline	136.0	7.6	8.6	5,610.0	240.2
Heavy Duty Diesel Vehicles	284.7	38.1	17.7	390.9	62.7
Heavy Duty Gasoline Vehicles	14.9	0.0	0.0	224.6	23.2
Light Duty Gasoline Vehicles	35.5	0.0	0.0	286.4	43.5
Secondary Vehicle Emissions	130.0	3.7	9.7	484.2	76.4
Weed Burning	0.0	0.0	872.7	4,945.5	698.2
Wind Erosion	0.0	0.0	104.7	0.0	0.0
TOTAL	1,661.4	135.7	1,100.9	9,206.6	1,242.20
Getty					
Tractors	195.0	18.0	15.0	51.0	15.0
Heavy Duty Diesel Vehicles	1,136.4	151.2	109.2	728.8	116.4
Heavy Duty Gasoline	116.6	7.2	7.2	4,879.4	145.2
Light Duty Gasoline Vehicles	13.8	0.9	1.8	73.6	9.2
Secondary Vehicle Emissions	43.0	2.3	5.3	215.4	22.8
Wind Erosion	0.0	0.0	713.0	0.0	0.0
TOTAL	1,504.8	179.6	851.5	5,947.4	308.6
PIPELINE OPERATION[2]					
Las Flores - Emidio					
Cuyama Pumping Station Heaters	192.0	0.6	1.1	48.0	8.0
Emidio-Blythe					
Emidio Pump Station Heaters	320.0	1.1	2.3	80.0	13.1
Twelve-Gauge Pump Station Heaters	192.0	0.6	1.1	48.0	8.0

TABLE A-11 (CONTINUED)

	Emissions (lb/day)				
	NO_x	SO_2	TSP	CO	HC
Cadiz Pump Station					
Heaters	256.0	1.1	1.6	64.0	10.6
Tanks	0.0	0.0	0.0	0.0	223.0
Blythe-McCamey					
La Paz Pump Station					
Heaters	256.0	1.1	1.6	64.0	10.6
Compressors	666.9	0.0	0.0	214.9	40.8
Gila Pump Station					
Heaters	288.0	1.1	2.3	72.0	11.8
Compressors	666.9	0.0	0.0	214.9	40.8
Coolidge Pump Station					
Heaters	288.0	1.1	2.3	72.0	11.8
Compressors	666.9	0.0	0.0	214.9	40.8
Tom Mix Pump Station					
Compressors	666.9	0.0	0.0	214.9	40.8
Hot Springs Pump Station					
Heaters	256.0	1.1	1.6	64.0	10.6
Compressors	666.9	0.0	0.0	214.9	40.8
Lordsburg Pump Station					
Heaters	288.0	1.1	2.3	72.0	11.8
Anthony Pump Station					
Heaters	288.0	1.1	2.3	72.0	11.8
Salt Flats Pump Station					
Heaters	288.0	1.1	2.3	72.0	11.8
Wink Pump Station					
Heaters	288.0	1.1	2.3	72.0	11.8

Source: [1]AP-42 Sec. 3.2, Sec. 2.4, and Sec. 11.2

Source: [2]AP-42, Sec. 1.4

TABLE A-12

MODEL INPUTS USED IN THE ISC MODEL FOR CONSTRUCTION ANALYSIS

Volume Source Data[1]

Length	= 30.5 m
Width	= 30.5 m
Height	= 5.0 m
Elevation	= 0.0 m
Temperature	= 293.0°K (Ambient)
Emission Rate[2]	= 1g/sec

Meteorological Data

Wind Direction	= 0°
Wind Speed	= 2.45 m/sec
Mixing Height	= 10,000 m
Temperature	= 293.0°K
Stability	= 6

Source: ERT

[1]Source data represents data for a single box. Using a series of those boxes next to each other would then represent a line source. As suggested in the ISC Manual, 132 boxes would be required to represent a 5-mile line source.

[2]Concentrations for each pollutant would be computed by using the ratio of the actual emissions (Table A-11) to the generic emission rate (1g/sec.).

TABLE A-13

MODEL INPUTS USED IN THE COMPLEX I MODEL FOR OPERATIONAL ANALYSIS

Source Data	Heaters	Compressors
Stack Height (m)	9.1	6.1
Stack Diameter (m)	1.1	1.2
Stack Velocity (m/sec)	6.9	10.4
Stack Temperature (°K)	480.0	394.0
Emission Rate (g/sec)[1]	1.0	1.0

Stability	Wind Speed (m/sec)	Temperature (°K)	Wind Direction (degrees)	Mixing Height (meters)
Meteorological Data				
1	0.5	293	180	400
1	0.8	293	180	400
1	1.0	293	180	400
1	1.5	293	180	400
1	2.0	293	180	400
1	2.5	293	180	400
1	3.0	293	180	400
2	0.5	293	180	400
2	0.8	293	180	400
2	1.0	293	180	400
2	1.5	293	180	400
2	2.0	293	180	400
2	2.5	293	180	400
2	3.0	293	180	400
2	4.0	293	180	400
2	5.0	293	180	400
3	2.0	293	180	400
3	2.5	293	180	400
3	3.0	293	180	400
3	4.0	293	180	400
3	5.0	293	180	400
3	7.0	293	180	400
3	10.0	293	180	400
3	12.0	293	180	400
3	15.0	293	180	400
4	0.5	293	180	400
4	0.8	293	180	400
4	1.0	293	180	400
4	1.5	293	180	400
4	2.0	293	180	400
4	2.5	293	180	400

TABLE A-13 (CONTINUED)

Stability	Wind Speed (m/sec)	Temperature (°K)	Wind Direction (degrees)	Mixing Height (meters)
4	3.0	293	180	400
4	4.0	293	180	400
4	5.0	293	180	400
4	7.0	293	180	400
4	10.0	293	180	400
4	12.0	293	180	400
4	15.0	293	180	400
4	20.0	293	180	400
5	2.0	293	180	400
5	2.5	293	180	400
5	3.0	293	180	400
5	4.0	293	180	400
5	5.0	293	180	400
6	2.0	293	180	400
6	2.5	293	180	400
6	3.0	293	180	400
6	4.0	293	180	400
6	5.0	293	180	400

Source: ERT

[1]See note 2, Table A-12.

TABLE A-14

MODEL INPUTS USED IN THE VALLEY MODEL FOR OPERATIONAL ANALYSIS

Source Data	Heaters	Compressors
Stack Height (m)	9.1	6.1
Stack Diameter (m)	1.1	1.2
Stack Velocity (m/sec)	6.9	10.4
Stack Temperature (°K)	450.0	394.0
Emission Rate (g/sec)[1]	1.0	1.0

Meteorological Data	Stability	Wind Speed (m/sec)	Temperature (°K)	Wind Direction (degrees)	Mixing Height (meters)
	6	2.45	293	180	10,000

Source: ERT

[1]See note 2, Table A-12.

APPENDIX B

AQUATIC AND TERRESTRIAL BIOLOGY

TABLE B-1

SCIENTIFIC NAMES OF FISH OCCURRING IN STREAMS CROSSED BY THE CELERON/ALL AMERICAN AND GETTY PROPOSALS AND ALTERNATIVES

Scientific Name	Common Name
Petromyzontidae	Lampreys
Entosphenus tridenlatus	Pacific lamprey
Lepisosteidae	Gars
Lepisosteus osseus	Longnose gar
Clupeidae	Herrings
Dorosoma cepedianum	Gizzard shad
Dorosoma petenense	Threadfin shad
Salmonidae	Trouts
Salmo gairdneri	Rainbow trout
Osmeridae	Smelts
Hypomesus olidus	Pond smelt
Characidae	Characins
Astyanax mexicanus	Mexican tetra
Cyprinidae	Minnows and Carps
Agosia chrysogaster	Longfin dace
Carassius auratus	Goldfish
Cyprinus carpio	Carp
Gila intermedia	Gila chub
G. orcutti	Arroyo chub
Hesperoleucas macrolepidottus	California roach
Hybognathus regius	Eastern silvery minnow
Hybopsis aestivalis	Speckled chub
Lavinia exilicauda	Hitch
Meda fulgida	Spikedace
Mylophorodon conocephalus	Hardhead
Notropis jemezanus	Rio Grande shiner
N. lutrensis	Red shiner
N. proserpinus	Proserpine shiner
Pimephales promelas	Fathead minnow
P. vigilax	Bullhead minnow
Pogonichthys macrolepidottus	Spittail
Rhinichthys cataractae	Longnose dace
R. osculus	Speckled dace
Tiaroga cobitis	Loach minnow

TABLE B-1 (CONTINUED)

Scientific Name	Common Name
Catostomidae	Suckers
Carpiodes carpio	River carpsucker
Catostomus clarki	Desert sucker
C. insignis	Sonora sucker
Ictiobus bubalus	Smallmouth buffalo
I. niger	Black buffalo
Xyrauchen texanus	Razorback sucker
Ictaluridae	Freshwater Catfishes
Ictalurus catus	White catfish
I. melas	Black bullhead
I. natalis	Yellow bullhead
I. nebulosus	Brown bullhead
I. punctatus	Channel catfish
Pylodictis olivaris	Flathead catfish
Cyprinodontidae	Killifishes
Cyprinodon pecosensis	Pecos pupfish
Fundulus zebrinus	Rio Grande killifish
Lucania parva	Rainwater killifish
Poeciliidae	Livebearers
Gambusia affinis	Mosquitofish
Poecilia latipinna	Sailfin molly
Gasterosteidae	Sticklebacks
Gasterosteus aculeatus	Threespine Stickleback (partially armored form)
Centrarchidae	Sunfishes
Lepomis cyanellus	Green sunfish
L. macrochirus	Bluegill
L. megalotis	Longear sunfish
L. microlophus	Redear sunfish
Micropterus salmoides	Largemouth bass
Pomoxis annularis	White crappie
P. nigromaculatus	Black crappie
Percidae	Perches
Etheostoma lepidum	Greenthroat darter
Percina macrolepida	Bigscale logperch
Cichlidae	Cichlids
Tilapia mossambica	Mozambique tilapia
T. zilli	Zill's tilapia

TABLE B-1 (CONTINUED)

Scientific Name	Common Name
Mugilidae	Mullets
Mugil cephalus	Striped mullet
Gobiidae	Gobies
Eucyclogobius newberryi	Tidewater goby
Percichthyidae	Temperate Basses
Morone saxatilis	Striped bass

Source: American Fisheries Society. 1977. A List of Common and Scientific Names of Fishes from the United States and Canada. Special Publication No. 6. 149 pp.

TABLE B-2

HABITAT REQUIREMENTS AND LIFE HISTORY INFORMATION FOR IMPORTANT FISH SPECIES

Species	Habitat Requirements		Life History	Sources
	Juveniles	Adults		
Threatened and Endangered				
Blue sucker	Similar to adults	Channels and flowing pools with moderate current; substrate usually exposed bedrock in combination with hard clay, sand, and gravel	Feeds mainly on aquatic insects and other small invertegrates; spawn in spring at temperatures of 10-15°C in riffles	Lee et al. (1980)
Fountain darter	Similar to adults	Areas where vegetation grows close to substrate and water is clear, warm (21-33°C) and quiet	Spawns year round in relatively constant temperature with two spawning peaks, August and late winter to early spring	Lee et al. (1980) Schenck and Whiteside (1977)
Gila chub	Areas with a current	Pool areas; feed in evening and early morning	Spawn mostly in late spring and summer; spawning season longer in spring fed ponds	Minckley (1973)
Gila topminnow	Not known	Congregate in areas of moderate current, below riffles, and along the margins of flowing streams in accumulated algal mats	Spawn from January to August in springs	Minckley (1973)
Mexican tetra	Not known	Variety of stream and river habitats; congregate in schools below swift waters, eddies and pools	Spawn in late spring and summer	Hubbard et al. (1979) Lee et al. (1980)
Proserpine shiner	Similar to adults	Clear streams in habitats from pools to swift channels and riffles	Little known; feeds near bottom; usually reproduce after severe flooding	Lee et al. (1980)
Razorback sucker	Young-of-the-year prefer soft silt and quiet water	Prefer gravel bars; stay in deeper sections of the river during the day; feed in shallows at night	Spawn in mid-January-April at temperatures of 12°-15°C	Ulmer (1984)
Rio Grande darter	Similar to adults	Riffle portions of rivers and springs or adjacent areas in Edwards Plateau; found in gravel and rubble areas and in vegetated pools	Spawn late March to early June at 21°C	Lee et al. (1980) Kuehne and Barbour (1983)

TABLE B-2 (CONTINUED)

Species	Habitat Requirements		Life History	Sources
	Juveniles	Adults		
River darter	Water depth less than than 1/2 meter	Found in deep chutes and riffles where current is swift and bottom composed of coarse gravel or rock; relatively tolerant of turbidity; water depth usually greater than 3 ft.	Feed mainly on midge and caddisfly larvae; spawn in spring at depths about 1.5 ft in areas with strong current, scattered rubble, and associated clean gravels	Lee et al. (1980) Kuehne and Barbour (1983)
San Marcos gambusia	Similar to adults	Restricted to shallow, quiet, mud-bottomed, shoreline areas without dense vegetation in thermally constant main channel	Little known	Lee et al. (1980)
Tidewater goby	Similar to adults	Lagoon areas of small coastal streams with a sand barrier; stay near bottom in shallow water (less than 6 ft depth) among macrophytes or in open	Spawn April-August with peak in April-May at temperatures of 15°-18°C; burrow into sand to lay eggs.	Swift (1984)
<u>Game Fish</u>				
Bluegill	Shallow water among vegetation	Wide range of environmental conditions; common in warm lakes, ponds, and slow-moving rivers and creeks with abundant vegetation	Spawn in spring and summer at temperatures of 18°-21°C	Lee et al., (1980) Moyle (1976)
Channel catfish	Shallow areas with cover (rocky riffles or debris-covered gravel); overwinter under boulders in riffles or in deep water	Variety of habitats but prefer main channels of large streams with cover (log jams, undercut banks); move to shoreline areas at night	Spawn in June-July at temperatures between 21° and 29°C; require cave-like sites for nests	Moyle (1976) McMahon and Terrell (1982)
Flathead catfish	Usually occur in riffles	Turbid waters of large rivers; live on bottom of deep pools or under rocks and logs in riffles or other fast-flowing areas.	Spawn in June-July; nest in bank or depression on bottom	Moyle (1976)
Largemouth bass	Shallow water among vegetation	Prefer warm, quiet waters with beds of aquatic macrophytes	Spawn in April-June at temperatures of 14°-24°C; build nest in sand, gravel, or debris-littered bottoms at depths of 3-6 ft	Moyle (1976)

TABLE B-2 (CONTINUED)

Species	Habitat Requirements: Juveniles	Habitat Requirements: Adults	Life History	Sources
Rainbow trout	Prefer velocities of 0.7-1.3 ft/sec, depth of 0.9-1.0 ft, and gravel substrates	Cool, clear, fast-flowing streams where riffles usually dominate over pools; utilize a variety of other habitat conditions; prefer velocities of 1.2-1.3 ft/sec, depths greater than 1.7 ft and gravel and sand substrates	Spawn in February-June, eggs hatch in 3-4 weeks	Moyle (1976); FWS (1982)
Striped bass	Eggs and larvae planktonic; juveniles form schools and prefer sand and gravel bottoms with some current	Utilize a wide range of physical and chemical conditions but require a large river with relatively fast flows for successful reproduction	Spawning in May-June at temperatures of 14° to 20°C	Moyle (1976) Scott and Crossman (1973).
White bass	Usually found in surface waters	Best adapted to lakes and reservoirs, but also live in large streams; prefer clear water	Spawning in April-May at 14°C on rocky riffles	Minckley (1973) Scott and Crossman (1973)
White catfish	Not known	Prefer river sections with relatively low flows; avoid dense macrophyte beds and water less than 6 ft	Spawn in June and July at temperatures exceeding 21°C	Moyle (1976)
Native Non-game Fish				
Desert sucker	Congregate along banks in quiet water; move into the maintream as they increase in size	Prefer riffles or swift areas of pools	Spawn in late winter and early spring in riffles	Minckley (1973)
Prickly sculpin	Same as adults	Wide range of habitat conditions from fresh to saltwater; hide among submerged objects during the day; feed at night	Spawn in February-June at temperatures of 8°-13°C	Moyle (1976)
Sonora sucker	Shallow, quiet waters during early development	Prefer deep, quiet waters with gravel or rocky substrates	Spawn in February to early July in riffles	Minckley (1973)
Threespine stickleback	Same as adults	Quiet water in pools or backwaters with aquatic macrophytes and sand or mud bottoms	Spawn in April-July; build nests	Moyle (1976)

TABLE B-3

COMMON AND SCIENTIFIC NAMES OF PLANT SPECIES USED IN TEXT

Common Names	Scientific Names
TREES AND SHRUBS	
Alligator-bark juniper	*Juniperus deppeana*
Apache pine	*Pinus engelmannii*
Arizona white oak	*Quercus arizonica*
Arizona sycamore	*Platanus wrightii*
Ashe juniper	*Juniperus ashei*
Banana yucca	*Yucca baccata*
Black cottonwood	*Populus trichocarpa*
Blue oak	*Quercus douglasii*
Blue palo verde	*Cercidium floridum*
Bonpland willow	*Salix bonplandiana*
Brittle bush	*Encelia farinosa*
Bud sagebrush	*Artemisia spinescens*
Bursage	*Ambrosia ambrosioides*
Bush sunflower	*Encelia californica*
California sagebrush	*Artemisia californica*
Cat's claw	*Acacia greggii*
Canyon live oak	*Quercus chrysolepis*
Cattle spinach	*Atriplex polycarpa*
Ceanothus (Buckbrush)	*Ceanothus* spp.
Chamise	*Adenostoma fasciculatum*
Cheese brush	*Hymenoclea salsola* var. *pentalepis*
Coast live oak	*Quercus agrifolia*
Cottony buckwheat	*Eriogonum gossypinum*
Cottonwood	*Populus* spp.
Coulter pine	*Pinus coulteri*
Coyote brush	*Baccharis pilularis* spp. *consanguinea*
Creosote bush	*Larrea tridentata*
Crucifixion thorn	*Castela emoryi*
Desert sumac	*Rhus microphylla*
Desert willow	*Chilopsis linearis*
Digger pine	*Pinus sabiniana*
Emory oak	*Quercus emoryi*
Fourwing saltbush	*Atriplex canescens*
Fremont cottonwood	*Populus fremontii*
Gooding willow	*Salix goodingii*
Gray thorn	*Zizyphus obtusifolia*
Hickory	*Carya* spp.
Hackberry	*Celtis reticulata*
Honey mesquite	*Prosopis glandulosa*
Hopsage	*Grayia* spp.
Iodine bush	*Allenrolfia accidentalis*
Ironwood	*Olneya tesota*
Joshua tree	*Yucca brevifolia*

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TABLE B-3 (CONTINUED)

Common Names	Scientific Names
TREES AND SHRUBS (CONT.)	
Juniper	*Juniperus* spp.
Lompoc yerba santa	*Eriodictyon capitatum*
Manzanita	*Arctostaphylos* spp.
Mesquite	*Prosopis* spp.
Mexican piñon pine	*Pinus cembroides*
Morman tea	*Ephedra* spp.
Mule fat	*Baccharis glutinosa*
Netleaf hackberry	*Celtis reticulata*
Oak	*Quercus* spp.
Ocotillo	*Fouquieria* spp.
Palo verde	*Cercidium* spp.
Post oak	*Quercus stellata*
Purple sage	*Leucophyllum frutescens*
Quail bush	*Atriplex lentiformis*
Red berry	*Rhamnus crocea*
Refugio manzanita	*Arctostaphylos refugioensis*
Sage	*Artemisia* spp.
Saguaro cactus	*Carnegiea gigantea*
Salt bush	*Atriplex* spp.
Salt cedar	*Tamarix chinensis*
Scrub oak	*Quercus dumosa*
Shadscale	*Atriplex confertifolia*
Shinnery oak	*Quercus havardii*
Snakeweed	*Gutierrezia* spp.
Soaptree yucca	*Yucca elata*
Sotol	*Dasylirion* spp.
Tarbush	*Flourensia cernua*
Triangle-leaf bur sage	*Ambrosia deltoidea*
Valley oak	*Quercus lobata*
Velvet ash	*Fraxinus pennsylvanica* var. *velutina*
Western sycamore	*Platanus racemosa*
White alder	*Alnus rhombifolia*
White sage	*Salvia apiana*
Willow	*Salix* spp.
Wing scale	*Atriplex canescens*
Winterfat	*Ceratoides lanata*
Yerba santa	*Eriodictyon trichocalyx*
Yucca	*Yucca* spp.
GRASSES AND FORBS	
Alkali blite	*Suaeda fruitiosa*
Alkali mariposa lily	*Calochortus striatus*
Alkali sacaton	*Sporobolus airoides*
Arrowweed	*Pluchea sericea*
Barstow wooly sunflower	*Eriophyllum mohavense*

TABLE B-3 (CONTINUED)

Common Names	Scientific Names
GRASSES AND FORBS (CONT.)	
Black-flowered figwort	Scrophularia atrata
Black grama	Bouteloua eriopoda
Blue grama	Bouteloua gracilis
Bluestem	Andropogon spp.
Broom pea	Leguminosae
Buckwheat	Eriogonium spp.
Buffalo grass	Buchloe dactyloides
Calico monkey flower	Mimulus pictus
California buckwheat	Eriogonum fasciculatum
California ditaxis	Ditaxis californica
Catalina mariposa	Calochortus catalinae
Coastal sacahuista	Spartina spartinae
Comanche layia	Layia leucopappa
Coville's navarretia	Navarretia setiloba
Curly mesquite grass	Hilaria belangeri
Desert cymopterus	Cymopterus deserticola
Downy chess	Bromus tectorum
Dropseed grass	Sporobolus sp.
Grama	Bouteloua spp.
Hartweg's pseudobahia	Pseudobahia bahiaefolia
Hoffman's nightshade	Solanum xantii var. hoffmannii
Horseweed	Conyza canadensis
Indian ricegrass	Oryzopsis hymenoides
Little bluestem	Andropogon spp.
Lupine	Lupinus spp.
Mariposa lily	Calochortus spp.
Mohave spineflower	Chorizanthe spinosa
Muhly	Muhlenbergii spp.
Mustard	Brassica spp.
Parish's alkali grass	Puchinellia parishii
Parish's sidalcea	Sidalcea hickmannii var. parishii
Pigweed	Amaranthus spp.
Plains yucca	Yucca spp.
Primrose	Camissonia spp.
Red brome	Bromus rubens
Red stem filaree	Erodium circutarium
Sacahuista	Nolina erumpens
Sand dropseed	Sprobolys cryptandrus
Sand sagebrush	Artemisia filifolia
Sea-blight	Suaeda spp.
Seacoast bluestem	Andropogon littoralis
Sideoats grama	Bouteloua curtipendula
Smooth cordgrass	Spartina alterniflora
Sunflower	Helianthus spp.
Switchgrass	Panicum virgatum
Texas needlegrass	Stipa leucothricha
Texas wildrice	Zizania texana
Thistle	Cirsium spp.
Tobosa grass	Hilaria mutica

TABLE B-3 (CONTINUED)

Common Names	Scientific Names
GRASSES AND FORBS (CONT.)	
Vine mesquite grass	*Panicum obtusum*
Western wheatgrass	*Agropyron smithii*
Wild oat	*Avena fatua*
SUCCULENTS	
Agave	*Agave* spp.
Bakersfield cactus	*Opuntia basilaris* var. *treleasei*
Barrel cactus	*Ferocactus* spp.
Chollas spp.	*Opuntia* spp.
Lechuguilla	*Agave lechugilla*
Lloyd's hedgehog cactus	*Echinocereus lloydii*
Organpipe	*Stenocereus alamosensis*
Prickly pear	*Opuntia* spp.
Purple prickly pear	*Opuntia violacea* var. *santarita*
Sneed's pincushion cactus	*Coryphantha sneedi* var. *sneedi*
Tobusch fishhook cactus	*Ancistrocactus tobuschii*

Source: Brown, D. E. 1982. Desert Plants - Biotic Communities of the American Southwest - United States and Mexico. Boyce Thompson Southwestern Arboretum. Vol. 4 Numbers 1-4, 1982. 342 pp.

TABLE B-4

COMMON AND SCIENTIFIC NAMES OF WILDLIFE SPECIES USED IN TEXT

Common Names	Scientific Names
MAMMALS	
Antelope ground squirrel	Ammospermophilus spp.
Aoudad	Ammotragus lervia
Arizona cactus mouse	Peromyscus eremicus eremicus
Bats	Order Chiroptera
Beaver	Castor canadensis
Beechy (California) ground squirrel	Spermophilus beecheyi
Black bear	Ursus americanus
Black-tailed (California) jack rabbit	Lepus californicus
Black-tailed prairie dog	Cynomys ludovicianus
Bobcat	Felis rufus
Botta's pocket gopher	Thomomys bottae
Brush rabbit	Sylvilagus bachmani
Cactus mouse	Peromyscus eremicus
California ground squirrel	Spermophilus beecheyi
California mouse	Peromyscus californicus
California vole	Microtus californicus
Collared peccary	Dicotyles tajacu
Columbian black-tailed deer	Odocoileus hemionus columbianus
Coyote	Canis latrans
Deer mouse	Peromyscus maniculatus
Desert bighorn sheep	Ovis canadensis mexicana
Desert cottontail	Sylvilagus audubonii
Desert pocket gopher	Geomys arenarius
Desert pocket mouse	Perognathus penicillatus
Desert shrew	Notiosorex crawfordi
Dusky-footed woodrat	Neotoma fuscipes
Eastern mole	Scalopus aquaticus
Feral pigs	Sus spp.
Giant kangaroo rat	Dipodomys ingens
Gray fox	Urocyon cinereoargenteus
Gray squirrel	Sciurus carolinensis
Hispid pocket mouse	Perognathus hispidus
Jaguarundi	Felis yagouaroundi cacomitli
Kangaroo rat	Dipodomys spp.
Least shrew	Cryptotis parva
Little pocket mouse	Perognathus longimembris
Merriam's chipmunk	Eutamias merriami
Merriam's kangaroo rat	Dipodomys merriami
Mexican ground squirrel	Spermophilus mexicanus
Mojave ground squirrel	Spermophilus mohavensis
Mouflon	Ovis spp.
Mule deer	Odocoileus hemionus
Muskrat	Ondatra zibethicus
Nimble (Agile) kangaroo rat	Dipodomys agilis

Common Names	Scientific Names
MAMMALS (Cont.)	
Nine-banded armadillo	Dasypus novemcinctus
Nutria	Myocastar coypus
Ord's kangaroo rat	Dipodomys ordii
Pallid bat	Antrozous pallidus
Plains harvest mouse	Reithrodontomys montanus
Pocket gopher	Thomomys spp; Geomys spp.
Pocket mice	Perognathus spp.
Prairie dog	Cynomys spp.
Pronghorn	Antilocapra americana
Raccoon	Procyon lotor
Ringtail	Bassariscus astutus
San Diego pocket mouse	Perognathus fallax
San Joaquin (Nelson's) antelope squirrel	Ammospermophilus nelsoni
San Joaquin kit fox	Vulpes macrotis mutica
Southern grasshopper mouse	Onchomys torridus
Striped skunk	Mephitis mephitis
Texas antelope squirrel	Ammospermophilus interpres
Virginia opossum	Didelphis virginiana
Western gray squirrel	Sciurus griseus
Western spotted skunk	Spilogale gracilis
White-footed mouse	Peromyscus leucopus
White-tailed deer	Odocoileus virginianus
Yuma (Harris') antelope squirrel	Ammospermophilus harrisi
BIRDS	
Acorn woodpecker	Melanerpes formicivorus
Aplomado falcon	Falco femoralis septentrionalis
American kestrel	Falco sparverius
Arctic peregrine falcon	Falco peregrinus tundrius
Attwater's greater prairie chicken	Tympanuchus cupido attwateri
Bald (southern bald) eagle	Haliaeetus leucocephalus
Band-tailed pigeon	Columba fasciata
Black-bellied whistling duck	Dendrocygna autumnalis
Black-capped vireo	Vireo atricapilla
Black phoebe	Sayornis nigricans
Black rail	Laterallus jamaicensis
Black-tailed gnatcatcher	Polioptila melanura
Black-throated sparrow	Amphispiza bilineata
Blue-winged teal	Anas discors
Brown pelican	Pelecanus occidentalis
Burrowing owl	Athene cunicularia
Canada goose	Branta canadensis
Cactus wren	Campylorhynchus brunneicapillus
California condor	Gymnogyps californianus
California quail	Callipepla californica

TABLE B-4 (CONTINUED)

Common Names	Scientific Names
Common black hawk	Buteogallus anthracinus
Copper's hawk	Accipiter cooperii
Crissal thrasher	Toxostoma dorsale
Fulvous whistling duck	Dendrocygna bicolor
Gambel's quail	Callipepla gambelii
Golden-cheeked warbler	Dendroica chrysoparia
Golden eagle	Aquila chrysaetos
Gray hawk	Buteo nitidus pusillus
Green-winged teal	Anas crecca
Horned lark	Eremophila alpestris
Interior least tern	Sterna albifrons athalassos
Least Bell's vireo	Vireo bellii
Least tern	Sterna albifrons antillarum
LeConte's thrasher	Toxostoma lecontei
Loggerhead shrike	Lanius ludovicianus
Marsh hawk (Northern harrier)	Circus cyaneus
Mississippi kite	Ictinia mississippiensis
Mountain quail	Oreortyx pictus
Mourning dove	Zenaida macroura
Mottled duck	Anas fulvigula
Northern beardless tyrannulet	Camptostoma imberbe
Osprey	Pandion haliaetus
Phainopepla	Phainopepla nitens
Pintail	Anas acuta
Prairie falcon	Falco mexicanus
Reddish egret	Dichromanassa rufescens rufescens
Redhead	Aythya americana
Red-tailed hawk	Buteo jamaicensis
Roadrunner	Geococcyx californianus
Ruby-crowned kinglet	Regulus calendula
Rufous-sided towhee	Pipilo erythrophthalmus
Sage sparrow	Amphispiza belli
Scaled quail	Callipepla squamata
Scaup spp.	Aythya spp.
Screech owl	Otus asio
Scrub jay	Aphelocoma coerulescens
Snow goose	Chen caerulescens
Spotted owl	Strix occidentalis
Summer tanger	Prianga rubra
Swainson's hawk	Buteo swainsoni
Swainson's thrush	Catharus ustulatus
Swallow-tailed kite	Elanoides forficatus forficatus
Turkey vulture	Cathartes aura
Western flycatcher	Empidonax difficilis
Western (American) kestrel	Falco sparverius tinnunculus
Western meadowlark	Sturnella neglecta
Western screech owl	Otus kennicottii
White-faced ibis	Plegadis chihi

TABLE B-4 (CONTINUED)

Common Names	Scientific Names
White-fronted goose	Anser albifrons
White-necked raven	Corvus cryptoleucus
Wild turkey	Meleagris gallopauo
White-tailed hawk	Buteo albicaudatus hypospodius
White-tailed (Black-shouldered) kite	Elanus caeruleus
Whooping crane	Grus americana
Wood stork	Mycteria americana
Wrentit	Chamaea fasciata
Yellow-breasted chat	Icteria virens
Yuma clapper rail	Rallus longirostris yumaensis
Zone-tailed hawk	Buteo albonotatus
REPTILES	
Alligator lizard	Gerrhonotus spp.
American alligator	Alligator mississippiensis
Banded sand snake	Chilomeniscus cinctus
Blunt-nosed leopard lizard	Gambelia silus
Bolson tortoise	Gopherus flavomarginatus
Brush lizard	Urosaurus graciosus
California side-blotched lizard	Uta stansburiana elegans
California striped racer	Masticophis lateralis lateralis
Chuckwalla	Sauromalus spp.
Coast horned lizard	Phryonosoma coronatum
Coastal whiptail	Cnemidophorus tigris multiscutatus
Common king snake	Lampropeltis getulus
Desert horned lizard	Phrynosoma platyrhinos
Desert night lizard	Xantusia vigilis arizonae
Desert spiny lizard	Sceloporus magister magister
Desert tortoise	Gopherus agassizi
Earless lizard	Holbrookia spp.
Flat-tailed horned lizard	Phrynosoma mcalli
Fringe-toed lizard	Uma notata
Gopher snake	Pituophis melanoleucus
Greater earless lizard	Cophosaurus texanus
Mexican milk snake	Lampropeltis triangulum annulata
Mojave rattlesnake	Crotalus scutulatus
Prairie rattlesnake	Crotalus viridis viridis
Rattlesnake	Crotalus spp.
Reticulated gecko	Coleonyx reticulatus
Roundtail horned lizard	Phrynosoma modestum
San Diego alligator lizard	Gerrhonotus multicarinatus webbi
Sidewinder	Crotalus cerastes
Southern desert horned lizard	Phrynosoma platyrhinos
Spadefoot toad	Scaphiopus spp.
Spiny lizard	Sceloporus spp.
Texas banded gecko	Coleonyx brevis
Texas horned lizard	Gopherus berlandieri
Texas tortoise	Phrynosoma cornutum
Trans-Pecos rat snake	Elaphe subocularis

TABLE B-4 (CONTINUED)

Common Names	Scientific Names
Western fence lizard	*Sceloporus occidentalis*
Western hognose snake	*Heterodon nasicus*
Western patch-nosed snake	*Salvadora hexalepis*
Western toad	*Bufo boreas*
Western whiptail	*Cnemidophorus tigris*
Whiptail	*Cnemidophorus* spp.
Whipsnake	*Masticophis* spp.
AMPHIBIANS	
California slender salamander	*Batrachoseps attenuatus*
Houston toad	*Bufo houstonensis*
Red-legged frog	*Rana aurora*
Rio Grande frog	*Syrrhophus cystignathoides campi*
Tehachapi slender salamander	*Batrachoseps stebbinsi*

Source: Mammals - Jones, J. K., D. C. Carter, and H. H. Genoways. 1979. Revised checklist of North American mammals north of Mexico. Occas. Papers, The Museum, Texas Tech University, 62:1-17.

Birds - American Ornithologists' Union. 1982. Thirty-fourth supplement to the American Ornithologists' Union check-list of North American birds. Supplement to the Auk. Volume 99, No. 3. 16 pp.

Amphibians and Reptiles - Collins, J. T., J. E. Huheeny, J. L. Knight, and H. M. Smith. 1978. Standard common and current scientific names for North American amphibians and reptiles. Society for the Study of Amphibians and Reptiles. Misc. Publ. Circ. No. 7. 36 pp.

TABLE B-5

COVER TYPES AND MAJOR PLANT AND ANIMAL ASSOCIATIONS ALONG THE PROPOSED GETTY AND CELERON/ALL AMERICAN PIPELINE

Cover Type	Major Plant Community/Association	Characteristic Plant Species	Characteristic Wildlife Species
Grassland	California Coastal grassland and Cuyama Valley grassland	Wild oats, downey chess, red brome, red stem filaree, mustards and other forbs	Western toad, gopher snake, western hognose snake, earless lizard, turkey vulture, mourning dove, horned lark, western meadowlark, American kestrel, cactus wren, California ground squirrel, Botta's pocket gopher, Merriam's kangaroo rat, California vole, black-tailed jack rabbit, coyote, hispid pocket mouse
	New Mexico Semi-desert and short-grass	Grama, muhly, buffalo grass, alkali sacaton, vine mesquite grass	Pronghorn, coyote, prairie dog, prairie rattlesnake
	Texas Tobosa grass-buffalo grass	Tobosa grass, buffalo grass, blue grama, sideoats grama, black grama, little bluestem, western wheatgrass, Indian grass, switchgrass	Pronghorn, coyote
Coastal sage scrub	California California sagebrush	California sagebrush, purple sage, white sage, coyote brush, California buckwheat, sunflower	San Diego Pocket mouse, nimble kangaroo rat, bobcat, California quail, sage sparrow, scrub jay, California side-blotched lizard, coastal whiptail, California striped racer
Chaparral	California Chamise, ceanothus, manzanita	Chamise, ceanothus, manzanita, scrub oak, red berry	Brush rabbit, California mouse, gray fox, wrentit, scrub jay, rufous-sided towhee, western fence lizard, San Diego alligator lizard, western patch-nosed snake
Oak Woodland	California Quercus	Coast live oak, canyon live oak, valley oak, blue oak	Western gray squirrel, Merriam's chipmunk, Columbian black-tailed deer, acorn woodpecker, western flycatcher, screech owl, common king snake, gopher snake, coast horned lizard
Desert scrubland	California Cuyama alkali scrub	Wing scale, cattle spinach, quail bush, iodine bush, alkali blite	Black-tailed jack rabbit, antelope ground squirrel, pocket mice, marsh hawk (northern harrier), American kestrel, meadowlark
	Creosote-bursage (Mojave Desert)	Creosote bush, bursage, brittle bush	Cactus mouse, coyote, Merriam's kangaroo rat, red-tailed hawk, golden eagle, LeConte's thrasher, desert tortoise, Mojave rattlesnake, desert night lizard

TABLE B-5 (CONTINUED)

Cover Type	Major Plant Community/Association	Characteristic Plant Species	Characteristic Wildlife Species
Desert scrubland (cont.)	Arizona (Sonoran Desert)		
	Saguaro-cactus	Saguaro, barrel cactus, palo verde, creosote bush, bursage, cholla, ocotillo	Coyote, desert cottontail, Arizona cactus mouse, roadrunner, mourning dove, cactus wren, chuckwalla, desert spiny lizard, brush lizard
	New Mexico (Chihuahuan Desert)		
	Creosote	Creosote bush, tarbush, agave, sotol, barrel cactus, yucca	Desert pocket gopher, Texas antelope squirrel, Ord's kangaroo rat, scaled quail, white-necked raven, black-throated sparrow, Texas banded-gecko, greater earless lizard, Trans-Pecos rat snake
	Texas (Trans-Pecos Desert)		
	Creosote-tarbush-cat's claw	Creosote bush, tarbush, cat's claw, agave, yucca, sotol, mesquite	As in New Mexico
Riparian woodlands	California		
	Oak-cottonwood-willow	Live oaks, western sycamore, white alder, Fremont cottonwood, black cottonwood, willow, mule fat	Mule deer, black bear, western gray squirrel, Swainson's thrush, least Bell's vireo, yellow-breasted chat, California slender salamander, king snake, alligator lizard
	Desert wash	Ironwood, palo verde	Cactus mouse, coyote, Merriam's kangaroo rat, red-tailed hawk, golden eagle, LeConte's thrasher, desert tortoise, Mojave rattlesnake, desert night lizard
	Arizona		
	Colorado River desert scrub (salt-cedar)	Salt-cedar, mesquite, willow	Desert pocket mouse, beaver, racoon, various bats, crissal thrasher
	Broadleaf deciduous woodland (sycamore - ash)	Arizona white oak, Arizona sycamore, velvet ash, Fremont cottonwood, Gooding and Bonpland willows, netleaf hackberry	Black phoebe, spade-foot toad, black hawk, northern beardless tyrannulet, mule deer, collared peccary
	Desert wash	Ironwood, palo verde, mesquite	Coyote, desert cottontail, Arizona cactus mouse, roadrunner, mourning dove, cactus wren, chuckwalla, desert spiny lizard, brush lizard
	New Mexico and Texas (Rio Grande and Pecos Rivers)	No riparian vegetation	--

Source: Adapted from Brown (1982) and Williams Brothers (1976).

TABLE B-6

SPECIAL CONCERN PLANTS AND ANIMALS POTENTIALLY OCCURRING ON OR NEAR THE CELERON/ALL AMERICAN AND GETTY PROPOSALS AND ALTERNATIVES

Common Name	Scientific Name	Occurrence	Habitat/Flowering Time	Status (Fed./State)	Reference
Plants					
Alkali mariposa lily	Calochortus striatus	Edwards AFB area, Kern Co.	Alkali meadows/ April-June	California species of concern (CNPS-2)	1
Bakersfield saltbush	Atriplex tularensis	Bakersfield region, Kern Co.	Alkali sinks/ June-Oct.	Federal candidate species - Category 1	2
Barstow wooly sunflower	Eriophyllum mohavense	Barstow area, Kern Co.	Sandy or rocky places 2,000-3,000 ft./ April-May	Federal candidate species - Category 2; California species of concern (CNPS-2); CDCA Plan	1, 2, 3
Biscuit cactus	Coryphantha vivipara var. buoflama	Arizona		Federal candidate species - Category 1	4
Black-flowered figwort	Scrophularia atrata	Coastal Santa Barbara Co., Gaviota Port - See Getty Application	Dry rocky places, diatomaceous shale/ April-July	Federal candidate species - Category 1; California species of concern (CNPS-2)	1, 2 +
Brewer's spineflower	Chorizanthe breweri	San Luis Obispo Co.	Dry rocky places, serpentine/May-June	Federal candidate species - Category 2; California species of concern (CNPS-2)	1, 2
Broad-leafed gilia	Gilia latifolia var. cuyamensis	Cuyama Valley, Santa Barbara and San Luis Obispo Co.	Sandy places, 2,300-3,300 ft./ April-May	California species of concern (CNPS-3)	1
Calico monkey flower	Mimulus pictus	Tejon Ranch, Kern Co.	Granite rock outcrops/ April-May	California species of concern (CNPS-3)	1
California jewelflower	Caulanthus californicus	Cuyama Valley, Kern Co. East San Luis Obispo Co., and adjacent Santa Barbara Co.	Dry plains and slopes below 3,000 ft./ March-April	Federal candidate species - Category 2	2
Catalina mariposa	Calochortus catalinae	South of Gaviota Pass, Santa Barbara Co. - See Getty Application	Grassland/ March-May	California species of concern (CNPS-3)	1 +
Clustered pincushion cactus	Mammillaria thornberi	Pinal and Pima Co. (Papago Res.) Arizona near Casa Grande	Sandy or fine soils under shrubs in flats & washes in the desert, 800-2,400 ft.	Federal candidate species - Category 1	4

TABLE B-6 (CONTINUEO)

Common Name	Scientific Name	Occurrence	Habitat/Flowering Time	Status (Fed./State)	Reference
Congdons eatonella	*Eatonella congdonii*	Cuyama area, Santa Barbara Co., San Luis Obispo Co., Kern Co.	Alkali plain, sand dunes/ March-April	California species of concern (CNPS-3)	1
Comanche layia	*Layia leucopappa*	Tejon hills, Kern Co.	Moist benches, valley grasslands/ March-June	Federal candidate species - Category 2; California species of concern (CNPS-2)	1, 2
Coast live oak	*Quercus agrifolia*	Tepusquet and La Brea Canyons	Coastal riparian areas	Protected by Santa Barbara Co. Ordinance 250	
No common name	*Coryphantha robbinsorum*	Arizona, Cochise Co.	Limestone areas of rocky hills, 1,280 meters, also desert grasslands/ March-April	Federal candidate species - Category 1	4
Crucifixion thorn	*Castela emoryi*	Southern Mojave Oesert, Kern Co.	Ory gravelly places/ June-July	California species of concern (CNPS-4); CDCA Plan	1, 3
Desert cymopterus	*Cymopterus deserticola*	Kramer area, Kern Co.	Sandy soil, old dune areas/ April	Federal candidate species - Category 2; California species of concern (CNPS-2); CDCA Plan	1, 2, 3
Eriophyllum	*Eriophyllum lanatum* var. *hallii*	Tejon area, Kern Co.	Foothill woodlands, 3,500 ft./ June-July	California species of concern (CNPS-2)	1
Foxtail cactus	*Coryphantha vivipara* var. *alversonii*	Eastern Mojave Oesert, Riverside Co.	Rocky slopes, 2,000-5,000 ft./ May-June	Federal candidate species - Category 2; California species of concern (CNPS-2)	1, 2
Hoffman's nightshade	*Solanum xantii* var. *hoffmannii*	Gaviota Pass, Santa Barbara Co. - See Getty Application	Coastal sage scrub 400-600 ft./ Feb.-July	California species of concern (CNPS-3)	1 +
Joshua tree	*Yucca brevifolia*	Mojave desert, Kern Co.	Oesert slopes and mesas/ March-April	Protected in Kern Co.	5 +
Kennedy buckwheat or Kern wild buckwheat	*Eriogonum kennedyi* var. *pinicola*	Sweetwater Ridge, Pine Tree Canyon, Kern Co.	Dry, exposed ridgetops 4,900-5,600 ft./ May-June	Federal candidate species - Category 2; California species of concern (CNPS-2)	1, 2 *
Kernville poppy	*Eschscholizia procera*	Kernville area, Kern Co.	Sand flats	Federal candidate species - Category 2	2 *

TABLE B-6 (CONTINUED)

Common Name	Scientific Name	Occurrence	Habitat/Flowering Time	Status (Fed./State)	Reference
Lost Hills saltbush	Atriplex vallicola	Soda Lake, Carrizo Plain, Kern Co.	Dried rainpools and flats, valley grass-land/ June-Aug.	Federal candidate species - Category 2; California species of concern (CNPS-2)	1, 2 *
Lompoc yerba santa	Eriodictyon capitatum	Gaviota Pass, Santa Barbara Co.	Oak woodlands and chaparral/ May-June	California species of concern (CNPS-2)	1
Mojave fishhook cactus	Sclerocactus polyan-cistrus	Western Arizona	Limestone and other rocky soils, hills and canyons in deserts, 750-1,500 meters	Federal candidate species - Category 2	2
Mojave spineflower	Chorizanthe spinosa	Western Mojave Desert, Kern Co.	Sandy washes and flats, 2,100-3,500 ft./ April-July	Federal candidate species - Category 2; California species of concern (CNPS-2); CDCA Plan	1, 2, 3
Night blooming cactus	Cereus greggii	Anthony Pass, Franklin Mts., Dona Ana Co., New Mexico (T26S R4E S28) - Possibly Luna, Grant, and Hidalgo Co.	Gravelly or silty areas in washes or flats, 3,000-5,000 ft./ June	Federal candidate species - Category 2; New Mexico species of concern	4
Parish's alkali grass	Puccinellia parishii	Kramer junction area, Kern Co.	Alkaline seeps, 2,900 ft. - Joshua tree woodland/ April-May	Federal candidate species - Category 2; California species of concern (CNPS-2); CDCA Plan	1, 2, 3
Parish's fleabane	Erigeron parishii	Southern Mojave Desert, San Bernardino Mts., San Bernardino Co.	Dry slopes, 3,500-5,000 ft. Joshua tree woodland/ May-June	California species of concern (CNPS-2)	1
Parish's sidalcea	Sidalcea hickmanii var. parishii	San Bernadino Mts., San Bernadino Co.; Mission Pine, Santa Barbara Co.	Chaparral, yellow pine forest, dry slopes, 4,500-7,000 ft./ May-July	Federal candidate species - Category 2; California species of concern (CNPS-2); Calif. Dept. Fish & Game-Rare	1, 2, 6
Piute jewelflower	Streptanthus cordatus var. piutensis	Monolith, Jawbone, and Pinetree Canyons, Kern Co.	Various soils, shattered metamorphic rock to fine red clay/ May-July	California species of concern (CNPS-2)	1
Red Rock tarweed	Hemizonia arida	Red Rock Canyon, Kern Co.	Creosote bush scrub 2,500 ft./ May-Nov.	Federal candidate species - Category 1; California species of concern (CNPS-2); CDCA Plan; California Dept. Fish & Game-Rare	1, 2, 3, 6 *

TABLE B-6 (CONTINUED)

Common Name	Scientific Name	Occurrence	Habitat/Flowering Time	Status (Fed./State)	Reference
Refugio manzanita	Arctostaphylos refugioensis	Gaviota Pass, Santa Barbara Co. - See Getty Application	Undisturbed chaparral, 400-600 ft.	California species of concern (CNPS-2)	1 +
Sand prickly pear	Opuntia arenaria	Rio Grande Valley - Mesquite Lake, Dona Ana Co., New Mexico	Sand dunes near river, sandy floodplains in arroyos, 3,600 ft./ May-June	Federal candidate species - Category 2	2
Santa Barbara jewelflower	Caulanthus amplexicaulis var. barbarae	Zaca Lake area, Santa Barbara Co.	Serpentine bluffs/ May-July	Federal candidate species - Category 2; California species of concern (CNPS-2)	1, 2
Santa Ynez or Santa Barbara false-lupine	Thermopsis macrophylla var. agnina	Solvang area, Santa Barbara Co.	Chaparral/ April-July	Federal candidate species - Category 2; California species of concern (CNPS-2); California Dept. Fish & Game - Rare	1, 2, 6
Slough thistle	Cirsium crassicaule	Kern Co.	Shallow water & wet places in fields/ June-August	Federal candidate species - Category 2; California species of concern (CNPS-2)	1, 2 *
Sneed's pincushion cactus	Coryphantha sneedi var. sneedi	Franklin Mts., Anthony Gap, Dona Ana Co., New Mexico; El Paso Co., Texas - T26S R4E S33,27	Limestone ledges in deserts and grasslands, 4,300-5,400 ft./ April-Sept.	Federal endangered	7
Tulare pseudobahia	Pseudobahia peirsonii	Northern Kern Co.	Valley grassland to 1,000 ft./ March-April	Federal candidate species - Category 2; California species of concern (CNPS-2)	1, 2 *
Valley saltbush	Atriplex patula subsp. spicata	Central Valley and adjacent coast ranges, Kern Co., Santa Barbara Co.	Alkali sinks/ April-Sept.	Federal candidate species - Category 2	2 *
Plant Communities					
Desert dune communities		Rice Valley, Riverside Co., CA; Gypsum Sand Dunes Nature Preserve, Texas		BLM sensitive community, California; Texas Nature Conservancy	3
Ironwood washes		Near Blythe, Riverside Co.		BLM sensitive community, California	3

TABLE B-6 (CONTINUED)

Common Name	Scientific Name	Occurrence	Habitat	Status (Fed./State)	Reference
Riparian woodlands		Coastal stream crossings		Protected by Santa Barbara Co. Ordinance 250	
Amphibians					
Leopard frog	Rana chiricahuensis	Lordsburg Playas, Hidalgo Co., New Mexico, T23S R21W S24	Near water	New Mexico special concern	8
Red-legged frog	Rana aurora	Tejon Ranch-Historic Record, Kern Co.	Marshes, slow parts of streams, lakes, reservoirs, ponds, tanks, springs, etc.	No status but occurs on list	9
Tehachapi slender salamander	Batrachoseps stebbinsi	Tehachapi, Kern Co.	Under rocks, logs, etc. 2,500-3,000 ft.	Federal candidate species; California Dept. Fish & Game - Rare	9, 10, 11
Reptiles					
Baird's rat snake	Elaphe obsoleta bairdi	Texas[a]	Rocky, wooded canyons and forested uplands	Texas threatened	12
Big Bend milk snake	Lampropeltis triangulum celaenops	Texas[c]	Wooded Mts., shin oak to pinyon juniper forests, up to 7,000 ft.	Texas threatened	12
Blunt-nosed leopard lizard	Gambelia silus	Cuyama Valley, Santa Barbara Co.; San Luis Obispo Co.; Maricopa to Metler, Kern Co.	Alkali sinks, sandy loam soils	Federal endangered; California Dept. Fish & Game-Endangered	9, 11, 13
Desert tortoise	Gopherus agassizi	Mojave Desert; Barstow to Blythe; Kofa National Wildlife Refuge, Arizona	Rocky foothills, lower bajadas, Sonoran desert & semi-desert grass-land	Federal candidate species - threatened; BLM-sensitive, proposed for threatened; Arizona-Group 3	3, 10, 14, 15
Gila monster	Heloderma suspectum suspectum	New Mexico-Hidalgo, Luna, Grant, Dona Ana Co. - T23S R20W S32	Rocky foothills of desert mountains	New Mexico-Group I	8

TABLE B-6 (CONTINUED)

Common Name	Scientific Name	Occurrence	Habitat	Status (Fed./State)	Reference
Gray-banded kingsnake	Lampropeltis mexicana alterna	Texas[c]	Chihuahuan Desert, arid to semi-arid habitats, desert flats and canyons to mts.	Texas threatened	12
Mojave desert fringe-toed lizard	Uma scoparia	Arizona, near Quartzite, Bouse Wash, Yuma Co.	Fine, wind blown sandy areas	Arizona-Group 3	15
Mountain short-horned lizard	Phrynosoma douglassi hernandesi	Texas[c]	Semi-arid plains to high mts., shortgrass prairie, sagebrush, pinon juniper, conifer	Texas threatened	12
Rock rattlesnake	Crotalus lepidus	Texas, Culberson Co.	Rocky habitats at higher elevations	Texas threatened	12, 16
Southern rubber boa	Charina bottae umbratica	California	Under logs, rocks, mixed coniferous-oak forests, 5,000-8,000 ft.	Forest Service-sensitive species; California Dept. Fish & Game-Rare	9, 17
Texas horned lizard	Phrynosoma cornutum	Texas[c]	Arid & semi-arid open country with sparse plant growth. Sand, loam, hardpan or rocky habitats	Texas threatened	12
Texas lyre snake	Trimorphodon biseutatus vilkinsoni	Texas[c]	Rock dweller, mesas, lower mt. slopes, hides in deep rocks	Texas threatened	12
Trans-Pecos copperhead	Agkistrodon contortrix pictigaster	Texas[a]	Oases in Chihuahuan Desert, near springs, canyons, river cane along Rio Grande River, sometimes deserts	Texas threatened	12
Trans-Pecos rat snake	Elaphe subocularis	Texas[c]; New Mexico - Dona Ana Co. along Rio Grande River, also Anthony Gap in Franklin Mts. T26S R4E	Chihuahuan Desert, rocky areas with shubby vegetation	Texas threatened; New Mexico-Group II	8, 12

TABLE B-6 (CONTINUED)

Common Name	Scientific Name	Occurrence	Habitat	Status (Fed./State)	Reference
Mammals					
Desert bighorn sheep	Ovis candadensis mexicana (In Arizona) Ovis canadensis nelsoni (In California)	Arizona, Dome Rock Mts., Kofa Natl. Wildlife Refuge-Yuma Co.; California, Big Maria/Little Maria Mts. Crossing-Riverside Co.	Rocky, steep slopes of mountains	Forest Service-sensitive species; Arizona-Group 3; BLM-sensitive	3, 9, 14, 15, 17
Giant kangaroo rat	Dipodomys ingens	California, Cuyama Valley to Maricopa-Santa Barbara Co., San Luis Obispo Co., Kern Co.	Fine sandy loam soils with sparse vegetation	California Dept. Fish & Game-Endangered; Forest Service-sensitive species	9, 11, 17
Mojave ground squirrel	Spermophilus mohavensis	Tehachapi to Barstow-Kern Co., San Bernardino Co.	Western Mojave Desert-alkali sink and salt-bush scrub, creosote bush scrub, Joshua tree woodland	California Dept. Fish & Game - Rare	9, 11
San Joaquin (Nelson's) antelope squirrel	Ammospermophilus nelsoni	Cuyama Valley to Maricopa-Santa Barbara Co., San Luis Obispo Co., Kern Co.	Dry, sparsely vegetated, loamy soils	California Dept. Fish & Game - Rare	9, 11
San Joaquin kit fox	Vulpes macrotis mutica	Cuyama Valley to Mettler-Santa Barbara Co., San Luis Obispo Co., Kern Co.	Alkali sink plant associations, annual grasslands	California Dept. Fish & Game - Rare; Federal endangered	9, 13
Spotted bat	Euderma maculatum	Texas[b]-Brewster Co., captured in Big Bend National Park	Ponderosa pine forest, high cliffs and canyons, low deserts, 6,000-8,000 ft.	Texas threatened	12
Birds					
American peregrine falcon	Falco peregrinus anatum	Texas[c]; Arizona, Yuma Co., Kofa National Wildlife Refuge; California; New Mexico, Rio Grande River, Luna Co.	Rocky cliffs for nesting	Texas endangered; Federal endangered; New Mexico-Group I; California Dept. Fish & Game-Endangered	8, 9, 12, 13
Arctic peregrine falcon	Falco peregrinus tundrius	Texas	Nests in cliff areas near water	Texas endangered; Federal endangered	12, 13

TABLE B-6 (CONTINUED)

Common Name	Scientific Name	Occurrence	Habitat	Status (Fed./State)	Reference
Aplomado falcon	Falco femoralis septentrionalis	Texas[c]; New Mexico, Luna, Grant Co. north of Separ - T24S R15W S8; south of Deming - T24S R9W S9	Arid, brushy prairie, yucca flats	Texas theatened; New Mexico-Group I	8, 12
Bell's vireo	Vireo bellii	New Mexico, Animas Mts., and north	Willow thickets along lowland streams, mesquite	New Mexico - Group II	8
Black hawk	Buteogallus anthracinus anthracinus	Texas[c]; Arizona, Muleshoe Ranch, Cochise Co.	Wooded stream bottoms	Texas threatened; Arizona-Group 3	12, 15
Black rail	Laterallus jamaicensis coturniculus	Colorado River - downstream from pipe-line crossing, Riverside Co., CA; Yuma Co., AZ	Marshes	California Dept. Fish & Game-Rare; Arizona Group-2	9, 15
Blue-throated hummingbird	Lampornis clemenciae	New Mexico, Anthony Gap, Franklin Mts., Dona Ana Co. T26S, R4E,S34	Wooded streams in lower canyons of mountains	New Mexico-special concern	8
California condor	Gymnogyps californianus	Cuyama Valley, Santa Barbara Co.; Tejon Ranch, San Luis Obispo Co.; Kern Co.	Rugged, rocky mts., open grasslands	Federal endangered; California Dept. Fish & Game-Endangered	9, 11, 13
Caracara	Caracara cheriway auduboni	New Mexico, Rio Grande Valley near Mesquite, Dona Ana Co. T25S R2E	Riparian, open country	New Mexico-Group I	8
Gila woodpecker	Melanerpes uropygialis uropygialis	New Mexico, Animas Mts. & north, Hildago Co.	Desert washes, saquaros, river groves, cottonwoods, towns	New Mexico-Group II	8
Golden eagle	Aquila chrysaetos	Elephant Mt. (eyrie), Newberry Mts, Rodman Mts. (Kilbeck Hills) - San Bernardino Co.; Kofa National Wildlife Refuge, Arizona	Widespread, prefers cliffs for nest sites	Forest Service-sensitive species	3, 14, 17
Gray hawk	Buteo nitidus maximus	Arizona, Muleshoe Ranch, Cochise Co.; Texas[c]	Wooded lowland streams, nests in mesquite, cottonwoods	Arizona-Group 2; Texas threatened	12, 15

TABLE B-6 (CONTINUED)

Common Name	Scientific Name	Occurrence	Habitat	Status (Fed./State)	Reference
Goshawk	Accipiter gentilis	California	Coniferous forests	Forest Service - sensitive species	17
Interior least tern	Sterna albifrons athalassos	Texas[c]		Texas endangered	12
Least Bell's vireo	Vireo bellii pusillus	Santa Barbara Co., CA	Riparian areas with dense understory; perennial water supply desired	Forest Service-sensitive species; California Dept. Fish & Game-Endangered	9, 17
Mississippi kite	Ictinia mississippiensis	New Mexico, Rio Grande Valley, Dona Ana Co.	Near river, riparian	New Mexico-Group II	8
Northern beardless tyrannulet	Camptostoma imberbe	Arizona	Woodlands, thickets	Arizona-Group 3	15
Olivaceous cormorant	Phalacrocorax olivaceous	New Mexico, Rio Grande Valley, Dona Ana Co.	Water, riparian, river	New Mexico-Group II	8
Osprey	Pandion haliaetus carolinensis	Texas[c]	Rivers, lakes	Texas threatened	12
Prairie falcon	Falco mexicanus	Elephant Mt. (eyrie), Newberry Mts., Rodeman Mts. - San Bernardino Co.; Kofa National Wildlife Refuge, Arizona	Dry, open country, prairies, occasionally woodlands, pinyon and and juniper, cliffs for nesting	Forest Service-sensitive species; California Dept. Fish & Game	3, 9, 17
Rufous-winged sparrow	Aimophila carpalis	Arizona, Coyote Mts., Tuscon Mts., east Tuscon, Oracle, Sonora to Sinaloa	Tall desert grass (tubosa), desert thornbrush	Arizona-status undetermined	15
Southern bald eagle	Haliaeetus leucocephalus leucocephalus	Texas[b]; Colorado River downstream from pipe-line crossing - Riverside Co., CA; Yuma Co., AZ	Roost trees and nearby water areas - winter only. Nests along Salt & Verde Rivers - Arizona	Texas endangered; Federal endangered; California Dept. Fish & Game-Endangered	9, 12, 13
Spotted owl	Strix occidentalis	California	Shaded cliffs or tree hollows near water	Forest Service - sensitive species	17
White-faced ibis	Plegadis chihi	Texas[c]	Water, agriculture	Texas threatened	12
Whooping crane	Grus americana	Wilcox playa, occasionally in winter	Marshlands, agriculture, water	Federal endangered	13

TABLE B-6 (CONTINUED)

Common Name	Scientific Name	Occurrence	Habitat	Status (Fed./State)	Reference
Wood stork	<u>Mycteria</u> <u>americana</u>	Texas[b]	Marshes, ponds, lagoons	Texas threatened	12
Yuma clapper rail	<u>Rallus longirostris yumaensis</u>	Colorado River - downstream from pipeline crossing, Riverside Co., CA; Yuma Co., AZ	Marshy areas along Colorado River, agricultural drains	Federal endangered; California Dept. Fish & Game-Rare	9, 13
Zone-tailed hawk	<u>Buteo</u> <u>albonotatus</u>	Texas[c], Arizona, Muleshoe Ranch, Cochise Co.	Arid country, desert mts., rivers	No official status in Arizona, limited distribution; Texas threatened	12, 15

FOOTNOTES:

1. California Native Plant Society (CNPS) 1980.
   List 1 - plants presumably extinct.
   List 2 - plants very rare or rare, which are also endangered.
   List 3 - plants that are rare.
   List 4 - plants rare in California, more common outside state.

2. U.S. Fish and Wildlife Service - Federal Register Vol. 48, No. 229.
   Category 1 - data available to support threatened or endangered status.
   Category 2 - further research needed to support threatened or endangered status.
   Category 3 - species no longer considered for listing as threatened or endangered.

3. California Desert Conservation Area Plan (CDCA) 1980.

4. U.S. Fish and Wildlife Service - Federal Register Vol. 45, No. 242
   (same definitions as No. 2 above).
   Threatened - species is likely to become endangered in the near future.
   Endangered - species is in imminent danger of extinction in the wild.

5. Ordinance No. 250 Species is protected in Kern Co., California.

6. California Department of Fish and Game 1982.
   List of Protected Plants - Rare
   Endangered

7. U.S. Fish and Wildlife Service - Federal Register Vol. 44, No. 217.
   Listing of Sneeds Pincushion Cactus.

8. Handbook of Species Endangered in New Mexico 1979.
   Group I - State Endangered - species whose prospects of survival or recruitment in the state are in jeopardy.
   Group II - State Endangered - species whose prospects of survival or recruitment within the state may become in jeopardy in the foreseable future.
   Endangered includes "rare, local, peripheral, and/or declining species".

9. California Department of Fish and Game - Natural Heritage Section, Planning Branch - California Natural Diversity Data Base.
   Includes 10 priority classes, from critically rare and endangered to possibly in peril and needing more information.

TABLE B-6 (CONTINUED)

FOOTNOTES (CONTINUED)

10. U.S. Fish and Wildlife Service letter to Bureau of Land Management - December 5, 1983 - #1-1-84-SP-47.

11. At the Crossroads - State of California 1980.

12. Communication from Floyd Potter - Texas Parks and Wildlife Department. Threatened and Endangered species list
Threatened - a species likely to become endangered in the foreseeable future throughout all or a portion of its range.
Endangered - a species in danger of extinction throughout all or a portion of its range.

13. U.S. Fish and Wildlife Service - 50 CFR 17.11, 17.12, 17.13.

14. Bureau of Land Management - Policy on Conserving Rare, Threatened, or Endangered Plants and Animals in California.

15. Threatened Native Wildlife in Arizona 1983.
Group 1 - species suspected to be extinct in Arizona but which occur elsewhere.
Group 2 - species whose continued presence in Arizona is in jeopardy and extirpation is probable if no recovery efforts are made.
Group 3 - species whose continued presence in Arizona could be in jeopardy in the foreseable future; habitats are threatened for these species.
Group 4 - species for which there is a moderate threat to the habitats they occupy.

16. Posionous Snakes of Texas - Bulletin #31. Texas Parks and Wildlife Department.

17. U.S. Forest Service, California - List of Threatened or Endangered Species 1982.

[a]Texas - Possible for this species to occur in one or more of the counties that the pipeline crosses.

[b]Texas - Probable for this species to occur in one or more of the counties that the pipeline crosses.

[c]Texas - Confirmed occurrence for this species in one or more of the counties that the pipeline crosses.

*Species not expected on pipeline route.

+This species likely to incur impacts. Source "California Desert Conservation Area Plan".

TABLE B-7

FEDERALLY LISTED WILDLIFE AND PLANT SPECIES OCCURRING FROM McCAMEY TO FREEPORT, TEXAS

	Pecos	Crockett	Sutton	Kimble	Kerr	Gillespie	Kendall	Comal	Guadalupe	Caldwell	Gonzales	Lavaca	Colorado	Wharton	Brazoria
Plants															
Texas wildrice (E)[1] Zizania texana								X		X					
Tobusch fishhook cactus (E) Ancistrocactus tobuschii					X										
Lloyd's hedgehog cactus (E) Echinocereus lloydii	X	X													
Mammals															
Jaguarundi (E) Felis yagouaroundi cacomitli															Po
Birds															
Brown pelican (E) Pelecanus occidentalis															C
Arctic peregrine falcon (E) Falco peregrinus tundrius	Po[2]	C [3]	Po	Po	Pr[4]	C	C	Pr	Pr	Pr	Pr	Pr	C	C	C
Bald Eagle (E) Haliaeetus leucocephalus	Po	Po	Po	C	C	Po	Po	Po	Pr	Pr	Pr	C	C	C	C
Attwater's greater prairie chicken (E) Tympanuchus cupido attwateri												Pr	C	C	C
Whooping crane (E) Grus americana								C	Pr	Pr	Pr	Pr	C	C	Pr
Reptiles															
American alligator * Alligator mississippiensis												X	X	X	X
Amphibians															
Houston toad (E) Bufo houstonensis									Po	Po	Po	Po	C	Po	Po
TOTAL	3	3	2	2	3	2	2	4	3	4	3	3	5	5	7

Source: Texas Parks and Wildlife Department.

[1](E) = Endangered
[2]Po = Possible
[3]C = Confirmed
[4]Pr = Probable

X = Occurs in County.

* = Status of alligator in Texas has recently changed.

TABLE B-8

MARINE MAMMALS AND TURTLES POTENTIALLY OCCURRING ALONG THE COAST NEAR BRAZORIA, TEXAS

Common Name	Scientific Name	Federal Status	Texas Status	Presence in Brazoria Co.
Mammals				
Bridled dolphin	Stenella frontalis		T	Po
Rough-toothed dolphin	Steno bredanensis		T	Po
Spotted dolphin	Stenella plagiodon		T	Po
Dwarf sperm whale	Kogia simus		T	Po
False killer whale	Pseudorca crassidens		T	Po
Goose-beaked whale	Ziphius cavirostris		T	Po
Gulf Stream beaked whale	Mesoplodon europaeus		T	Po
Killer whale	Orcinus orca		T	Po
Short-finned pilot whale	Globicephala macrorhyncha		T	Po
Pygmy killer whale	Feresa attenuata		T	Po
Pygmy sperm whale	Kogia breviceps		T	Po
Blue whale	Balaenoptera musculus	E	E	Po
Finback whale	Balaenoptera physalus	E	E	Po
Right whale	Eubalaena spp. (all species)	E	E	Po
Sperm whale	Physeter catodon	E	E	Po
West Indian manatee	Trichechus manatus	E	E	Po
Reptiles (Sea Turtles)				
Atlantic loggerhead	Caretta c. caretta		T	C
Atlantic green turtle	Chelonia m. mydas		T	C
Atlantic ridley turtle	Lepidochelys kempii		E	C
Hawksbill turtle	Eretmochelys imbricata		E	Po
Leatherback turtle	Dermochelys coriacea		E	Pr

Source: Texas Parks and Wildlife Department.

C = Confirmed

Pr = Probable

Po = Possible

T = Threatened

E = Endangered

TABLE B-9

STATE THREATENED OR ENDANGERED WILDLIFE SPECIES OCCURRING IN COUNTIES CROSSED BY THE ALL AMERICAN PIPELINE BETWEEN McCAMEY AND FREEPORT, TEXAS

	Pecos	Crockett	Sutton	Kimble	Kerr	Gillespie	Kendall	Comal	Guadalupe	Caldwell	Gonzales	Lavaca	Colorado	Wharton	Brazoria
Mammals															
Jaguarundi (E)[1] Felis yagouaroundi cocomitli															C[2]
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Birds															
Brown pelican (E) Pelecanus occidentalis															C
Bald eagle (E) Haliaeetus leucocephalus	Po[3]	Po	Po	C	Pr[4]	C	C	Pr	Pr	Pr	Pr	C	C^{N}[5]	C^{N}	C^{N}
Arctic peregrine falcon (E) Falco peregrinus tundrius	Po	C	Po	Po	C	Pr	Pr	Pr	Pr	Pr	Pr	Pr	C	C	C
Attwater's greater prairie chicken (E) Tympanuchus cupido attwateri												Pr	C	C	C
Whooping crane (E) Grus americana								C	Pr	Pr	Pr	Pr	C	C	Pr
Interior least tern (E) Sterna albifrons athalassos	Pr	Pr	Pr	Pr	Pr	Pr	Pr	Pr	Pr	Pr	Pr	Pr	Pr	Pr	Pr
Reddish egret (T)[6] Dichromanassa rufescens refescens											C		C	C	C
Aplomado falcon (T) Falco femoralis septentrionalis	Po	Po	Po	Po											
White-tailed hawk (T) Buteo albicaudatus hypospodius								C	Pr	Pr	Pr	C	C	C	C
Zone-tailed hawk (T) Buteo albonotatus	C	C	C	C	C	C	C	C	Pr	Pr	Pr	Pr			

TABLE B-9 (CONTINUED)

	Pecos	Crockett	Sutton	Kimble	Kerr	Gillespie	Kendall	Comal	Guadalupe	Caldwell	Gonzales	Lavaca	Colorado	Wharton	Brazoria
Birds (Continued)															
White-faced ibis (T) Plegadis chihi	Pr	Pr	Pr	Pr	Pr	Pr	Pr	Pr	Pr	Pr	Pr	Pr	C	C	C
Swallow-tailed kite (T) Elanoides forficatus forficatus								C	C	C	C	C	C	C	C
Osprey (T) Pandion haliaetus carolinensis	C	C	C	C	C	C	C	C	Pr	Pr	C	Pr	C	Pr	C
Wood stork (T) Mycteria americana	Pr	Pr	Pr	Pr	Pr	Pr	Pr	Pr	Pr	Pr	Pr	Pr	C	C	C
Least tern (T) Sterna albifrons antillarum									Pr	Pr	Pr	Pr	C	C	C
Golden-cheeked warbler (T) Dendroica chrysoparia				C	C	C	C	C	Pr	Pr	Pr	Pr			
TOTAL	8	8	8	9	8	8	8	11	12	12	13	13	12	12	13
Reptiles															
Texas tortoise (T) Gopherus berlandieri		Po					Po	Po	C	Pr	Pr	C		Po	Po
Texas horned lizard (T) Phrynosoma cornutum	C	C	C	C	C	C	C	C	Pr	Pr	C	Pr	Pr	Pr	C
Trans-Pecos copperhead (T) Agkistrodon contortrix pictigaster	C	C													
Gray-banded kingsnake (T) Lampropeltis mexicana alterna	Po	Po													
Rock rattlesnake (T) Crotalus lepidus	C				C										
Texas indigo snake (T) Drymarchon corais erebennus								Po	Pr	Pr	Pr	Pr			
Texas lyre snake (T) Trimorphodon biscutatus vilkinsoni	Po	Po	Po	Po											

TABLE B-9 (CONTINUED)

	Pecos	Crockett	Sutton	Kimble	Kerr	Gillespie	Kendall	Comal	Guadalupe	Caldwell	Gonzales	Lavaca	Colorado	Wharton	Brazoria
Reptiles (Continued)															
Louisiana milk snake (T) Lampropeltis triangulum amaura												Pr	Pr	Pr	Pr
Mexican milk snake (T) Lampropeltis triangulum annulata	Pr	Pr	Pr	Pr	C	C	C		Pr	Pr	Pr	Pr			
Baird's rat snake (T) Elaphe obsoleta bairdi	C	C	Po	Po	C										
Trans-Pecos rat snake (T) Elaphe subocularis	C	C													
American alligator* Alligator mississippiensis															
TOTAL	8	8	4	4	4	2	3	3	4	4	4	5	2	3	3
Amphibians															
Fern Bank Salamander (T) Eurycea neotenes pterophila							Pr								
Honey Creek salamander (T) Eurycea tridentifera								C							
Cascade Cavern salamander (E) Eurycea latitans							C								
Black-spotted newt (T) Notophthalmus meridionalis meridionalis												Po			
Houston toad (E) Bufo houstonensis									Po	Po	Po	Po	C	Po	Po
Rio Grande frog (T) Syrrhophus cystignathoides campi													C		
TOTAL	0	0	0	0	0	0	2	1	1	1	1	2	2	1	1
TOTAL	16	16	12	13	12	10	13	15	17	17	18	20	16	16	18

Source: Texas Parks and Wildlife Department.

[1](E) = Endangered

[2]C = Confirmed

[3]Po = Possible

[4]Pr = Probable

[5]N = Confirmed nester in this country

[6]T = Threatened

*Status of the alligator has recently changed in Texas.

TABLE B-10

SCIENTIFIC NAMES OF FISH POTENTIALLY OCCURRING IN AQUATIC SYSTEMS

McCAMEY TO FREEPORT, TEXAS

Scientific Name	Common Name	Status[1]
Lepisosteidae	Gars	
Atractosteus spatula	Alligator gar	G
Lepisosteus oculatus	Spotted gar	G
L. osseus	Longnose gar	G
Amiidae	Bowfins	
Amia calva	Bowfin	G
Anquillidae	Freshwater eels	
Anquilla rostrata	American eel	G
Clupeidae	Herrings	
Dorosoma cepedianum	Gizzard shad	NG
D. petenense	Threadfin shad	NG
Esocidae	Pikes	
Esox americanus	Redfin pickerel	G
Characidae	Characins	
Astyanax mexicanus	Mexican tetra	NG
Cyprinidae	Minnows and carps	
Campostoma anomalus	Central stoneroller	NG
Carassius auritus	Goldfish	NG
Cyprinus carpio	Carp	G
Dionda episcopa	Roundnose minnow	NG
Hybognathus nuchalis	Mississippi silvery minnow	NG
H. placitus	Plains minnow	NG
Notemigonus crysoleucas	Golden shiner	NG
Notropis amabilis	Texas shiner	NG
N. amnis	Pallid shiner	NG
N. atherinoides	Emerald shiner	NG
N. atrocaudalis	Blackspot shiner	NG
N. buccula	Smalleye shiner	NG
N. buchanani	Ghost shiner	NG
N. chalybaeus	Ironcolor shiner	NG
N. fumeus	Ribbon shiner	NG
N. lutrensis	Red shiner	NG
N. potteri	Chub shiner	NG
N. proserpinus	Proserpine shiner	T
N. shumardi	Silverband shiner	NG

TABLE B-10 (CONTINUED)

Scientific Name	Common Name	Status[1]
Poeciliidae	Livebearers	
Gambusia affinis	Mosquitofish	NG
G. geiseri	Largespring gambusia	NG
G. georgei	San Marcos gambusia	E
Poecilia formosa	Amazon molly	NG
P. latipinna	Sailfin molly	NG
P. reticulata	Guppy	NG
Atherinidae	Silversides	
Labidesthes sicculus	Brook silverside	NG
Menidia beryllina	Inland silverside	NG
Percichthyidae	Temperate basses	
Morone chrysops	White bass	G
M. mississippiensis	Yellow bass	G
M. saxatilis	Striped bass	G
Centrarchidae	Sunfishes	
Ambloplites rupestris	Rock bass	G
Centrarchus macropterus	Flier	NG
Elassoma zonatum	Banded pygmy sunfish	NG
Lepomis auritus	Redbreast sunfish	G
L. cyanellus	Green sunfish	G
L. gulosus	Warmouth	G
L. humilis	Orangespotted sunfish	G
L. macrochirus	Bluegill	G
L. marginatus	Dollar sunfish	NG
L. megalotis	Longear sunfish	G
L. microlophus	Redear sunfish	G
L. punctatus	Spotted sunfish	G
L. symmetricus	Bantam sunfish	G
Micropterus dolomieui	Smallmouth bass	G
M. punctulatus	Spotted bass	G
M. salmoides	Largemouth bass	G
Pomoxis annularis	White crappie	G
Pomoxis nigromaculatus	Black crappie	G
Percidae	Perches	
Ammocrypta clara	Western sand darter	NG
A. vivax	Scaly sand darter	NG
Etheostoma chlorosomum	Bluntnose darter	NG
E. fonticola	Fountain darter	E
E. gracile	Slough darter	NG
E. grahami	Rio Grande darter	T
E. lepidum	Greenthroat darter	NG

TABLE B-10 (CONTINUED)

Scientific Name	Common Name	Status[1]
Cyprinidae (Continued)		
N. simus	Bluntnose shiner	NG
N. texanus	Weed shiner	NG
N. umbratilis	Redfin shiner	NG
N. venustus	Blacktail shiner	NG
N. volucellus	Mimic shiner	NG
Opsopoeodus emilae	Pugnose minnow	NG
Phenacobius mirabilis	Suckermouth minnow	NG
Pimephales promelas	Fathead minnow	NG
P. vigilax	Bullhead minnow	NG
Catostomidae	Suckers	
Carpiodes carpio	River carpsucker	NG
Cycleptus elongatus	Blue sucker	T
Ictiobus bubalus	Smallmouth buffalo	NG
Minytrema melanops	Spotted sucker	NG
Moxostoma congestum	Gray redhorse	NG
M. poecilurum	Blacktail redhorse	NG
Ictaluridae	Bullhead catfishes	
Ictalurus furcatus	Blue catfish	G
I. melas	Black bullhead	G
I. natalis	Yellow bullhead	G
I. punctatus	Channel catfish	G
Noturus gyrinus	Tadpole madtom	NG
N. nocturnus	Freckled madtom	NG
Pylodictis olivaris	Flathead catfish	G
Aphredoderidae	Pirate perches	
Aphredoderus sayanus	Pirate perch	NG
Cyprinodontidae	Killifishes	
Cyprinodon pecosensis	Pecos pupfish	NG
C. variegatus	Sheepshead minnow	NG
Fundulus blairae	Batatit	NG
F. chrysotus	Golden topminnow	NG
F. jenkinsi	Saltmarsh topminnow	NG
F. pulvereus	Bayou killifish	NG
F. zebrinus	Plains killifish	NG
Lucania parva	Rainwater killifish	NG
Zygonectes notatus	Blackstripe topminnow	NG
Z. olivaceus	Blackspotted topminnow	NG

TABLE B-10 (CONTINUED)

Scientific Name	Common Name	Status[1]
Percidae (Continued)		
E. parvipinne	Goldstripe darter	NG
E. proeliare	Cypress darter	NG
E. radiosum	Orangebelly darter	NG
E. spectabile	Orangethroat darter	NG
Percina caprodes	Logperch	NG
P. macrolepida	Bigscale logperch	NG
P. sciera	Dusky darter	NG
P. shumardi	River darter	T
Sciaenidae	Drums	
Aplodinotus grunniens	Freshwater drum	G
Cichlidae	Cichlids	
Cichlasoma cyanoguttatum	Rio Grande cichlid	NG
Sarotherodon aureus	Blue tilapia	G
S. mossambicus	Mozambique tilapia	G
Mugilidae	Mullets	
Mugil cephalus	Striped mullet	NG

Sources: Hubbs 1982; USFWS 1983; Potter 1984, personal communication.

[1]Status: G = Game fish; NG = Non-game fish; E = Federally Endangered; T = State Threatened.

ENDANGERED SPECIES

Section 7 Consultation

Letters Requesting Lists of Species
Letters Requesting Revised Lists of Species
FWS List of Species
FWS Biological Opinion*

*To be inserted into the Final EIS/EIR

California Desert District
1695 Spruce Street
Riverside, California 92507

6840
(C-063.14)

DEC 15 1983

Jim Johnson, Chief
Endangered Species Office
U.S. Fish and Wildlife Service
P.O. Box 1306
Albequerque, New Mexico 87103

Dear Mr. Johnson:

The Bureau of Land Management, California Desert District, hereby requests two lists of officially listed, proposed, or candidate threatened or endangered species, pursuant to Section 7(c) of the Endangered Species Act, which might be affected by construction of two pipelines running from Blythe, California to West Texas.

Maps of the proposed All American Pipeline and Pacific Texas (Pac-Tex) Pipeline are attached. These are two independent construction projects, not alternatives to a single project. The pipelines generally follow existing rights-of-way. We have already received lists for the California portions from the Sacramento Office of the Fish and Wildlife Service.

Sincerely,

H. W. RIECKEN

Gerald E. Hillier
District Manager

ACTIN

Enclosures

bc: (w/encl)
C-932.51

LForeman:dkm:12/8/83

United States Department of the Interior

FISH AND WILDLIFE SERVICE

SACRAMENTO ENDANGERED SPECIES OFFICE
1230 "N" Street, 14th Floor
Sacramento, California 95814

Routing	Date	Intls.
TO: DM 1	12/13	[illegible]
ADM 2	12/12	[illegible]
P&EC 4		
PA		
ADMIN		
OPS		
RES 3	12/19	[illegible]
MIN		
AMs		
ESCON		
Action By:		
Return To:		

DEC 05 1983

In reply refer to: SESO
#1-1-84-SP-47

Mr. Gerald E. Hillier
Acting District Manager
Bureau of Land Management
1695 Spruce Street
Riverside, California 92507

Subject: Request for List of Endangered and Threatened Species in the Area of the All American Pipeline, Santa Barbara, Kern, San Bernardino, and Riverside Counties, California

Dear Mr. Hillier:

As requested by letter from your agency dated November 14, 1983, you will find attached a list of listed endangered and threatened species (Attachment A) that may be present in the area of the subject project. To the best of our knowledge no proposed species occur within the area. The list is intended to fulfill the requirement of the Fish and Wildlife Service to provide a list of species under Section 7(c) of the Endangered Species Act, as amended. Please see Attachment B for your requirements.

Also for your assistance, we have included a list of candidate species. These species are presently being reviewed by our Service for consideration to propose and list as endangered or threatened. Candidate species have no protection under the Endangered Species Act and are included for your consideration as it is possible the candidates could become formal proposals and be listed during the construction period.

Upon completion of the Biological Assessment (see Attachment B), should you determine that a listed species is likely to be affected (adversely or beneficially), then your agency should request formal Section 7 consultation through our office at the letterhead address. If there are both listed and candidate species (if included in the assessment) that may be affected and if requested, we will informally consult on the candidate species during the formal consultation. However, should the assessment reveal that only candidate species may be affected, then you should consider informal consultation with our office at the letterhead address.

One of the benefits of informal consultation to the consulting agency is to provide the necessary planning alternatives should a candidate species become listed before completion of a project. Informal consultation may also be utilized prior to a written request for formal consultation to exchange information and resolve conflicts with respect to listed species.

If the Biological Assessment is not initiated within 90 days of receipt of this letter, you should informally verify the accuracy of the list with our office.

Should you have any additional questions regarding this list or your responsibilities under the Act, please contact Mr. Ralph Swanson at (FTS) 448-2791 or (916) 440-2791. Thank you for your interest in endangered species, and we await your assessment.

Sincerely yours,

Gail C. Kobetich

Project Leader

Attachments

LISTED AND PROPOSED ENDANGERED AND THREATENED SPECIES, AND CANDIDATE SPECIES THAT MAY OCCUR IN THE AREA OF THE PROPSED ALL AMERICAN PIPELINE SANTA BARBARA, KERN, SAN BERNARDINO, AND RIVERSIDE COUNTIES, CALIFORNIA #1-1-84-SP-47

LISTED SPECIES

Blunt-nosed leopard lizard, *Gambelia silus*
San Joaquin kit fox, *Vulpes macrotis mutica*

PROPOSED SPECIES

None

CANDIDATE SPECIES

Tidewater goby, *Eucyclogobius newberryi*
Tehachapi slender salamander, *Batrachoseps stebbinsi*
Desert tortoise, *Scaptochelys* (=*Gopherus*) *agassiyii*

Plants

Valley saltbush, *Atriplex patula* subsp. *spicata* (2)
Bakersfield saltbush, *Atriplex tularensis* (1)
Lost Hills saltbush, *Atriplex vallicola* (2)
Santa Barbara jewelflower, *Caulanthus amplexicaulis* var. *barbarae* (2)
California jewelflower, *Caulanthus californicus* (2)
Brewer's spineflower, *Chorizanthe breweri* (2)
Mojave spineflower, *Chorizanthe spinosa* (2)
Slough thistle, *Cirsium crassicaule* (2)
Desert cymopterus, *Cymopterus deserticola* (2)
Kern wild buckwheat, *Eriogonum kennedyi* var. *pinicola* (2)
Barstow wooly-sunflower, *Eriophyllum mohavense* (2)
Kernville poppy, *Eschscholzia procera* (2)
Red Rock tarweed, *Hemizonia arida* (1)
Comanche layia, *Layia leucopappa* (2)
Tulare pseudobahia, *Pseudobahia peirsonii* (2)
Parish's alkali grass, *Puccinella parishii* (2)
Black-flowered figwort, *Scrophularia atrata* (2)
Parish's sidalcea, *Sidalcea hickmanii* subsp. *parishii* (2)
Santa Barbara false-lupine, *Thermopsis macrophylla* var. *agnina* (2)

(1) = Category 1
(2) = Category 2

ATTACHMENT B

FEDERAL ACTION AGENCY REQUIREMENTS UNDER SECTION 7(c)

Biological Assessments

This process is intitiated by a Federal agency in requesting a list of proposed and listed endangered and threatened species that may be within the area of a construction project.[1/] The purpose of the assessment is to identify any proposed and/or listed species which are/is likely to be affected by a construction project. The assessment should be completed within 180 days after initiation of the assessment (or within such a time period as is mutually agreed to by our two agencies). If the Biological Assessment is not initiated within 90 days of receipt of the species list, your agency should informally verify the accuracy of the list with our Service. No irreversible commitment of resources is to be made during the Biological Assessment process which would result in violation of your requirements under section 7(a) of the Act. Planning, design, and administrative actions may be taken by your agency; however, no construction may begin.

Your agency should: conduct an on-site inspection of the area to be affected by the proposal which may include a detailed survey of the area to determine if the species is present and whether suitable habitat exists for either expanding the existing population or for potential reintroduction of the species; review literature and scientific data to determine species distribution, habitat needs, and other biological requirements; interview experts including those within Fish and Wildlife Service, National Marine Fisheries Service, State conservation departments, universities and others who may have data not yet published in scientific literature; review and analyze the effects of the proposal on the species in terms of individuals and populations, including consideration of cumulative effects of the proposal on the species and its habitat; analyze alternative actions that may provide conservation measures. At the conclusion of the assessment as described above, the Federal agency shall prepare a report documenting the results. The report shall also include a discussion of study methods used, any problems encountered, and other relevent information. Upon completion, the report should be forwarded to our office (1230 "N" Street, 14th Floor, Sacramento, CA 95814).

1/ "Construction Project" means any major Federal action which significantly affects the quality of the human environment designed primarily to result in the building or erection of man-made structures such as dams, buildings, roads, pipelines, channels, and the like. This includes Federal actions such as permits, grants, licenses, or other forms of Federal authorization or approval which may result in construction.

IN REPLY REFER TO:

SE

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

POST OFFICE BOX 1306
ALBUQUERQUE, NEW MEXICO 87103

JAN 27 1984

Cons. No. 2-01-84-I-02

MEMORANDUM

To: Mr. D. Dean Bibles, State Director, Bureau of Land Management, Phoenix, Arizona

From: Regional Director, Region 2 (SE)

Subject: Species List for All-American Pipeline

This is in response to your letter dated December 15, 1983, concerning the All-American Pipeline. As provided by Section 7 of the Endangered Species Act, the U.S. Fish and Wildlife Service furnishes, upon request, a list of federally listed and proposed species that may be affected by Federal actions. The Regional Office of Endangered Species has used the information in your request to narrow the list of listed and proposed species which occur along the pipeline from Ehrenberg, Arizona, to Midland, Texas, to those that potentially may be affected by the proposed action (see attachment).

If the Federal action is considered a major action significantly affecting the quality of the human environment, the Federal agency authorizing, funding, or carrying out the Federal action will conduct a biological assessment to determine whether or not the Federal action will affect listed or proposed species. Preparation of the assessment may begin upon receipt of the U.S. Fish and Wildlife Service's species list.

The biological assessment shall be completed within 180 days after receipt of the species list, unless it is mutually agreed to extend this period. If the assessment is not initiated within 90 days after receipt of the species list, I suggest its accuracy be verified before conducting the assessment.

The biological assessment should include as a minimum:

1) onsite inspection of the area affected by the proposed activity or program, including a detailed survey of the area to determine if species are present and whether suitable habitat exists for either expanding the existing population or potential reintroduction of populations;

2) interviews with recognized experts on the species at issue, including personnel of the U.S. Fish and Wildlife Service, of State conservation departments, of universities, and others who may have data not yet found in scientific literature;

3) review literature and other scientific data to determine the species distribution, habitat needs, and other biological requirements;

4) review and analysis of the effects of the proposed action on individuals and populations, including consideration of both direct and indirect effects of the proposal on the species and its habitat;

5) analysis of alternative actions that may promote conservation of the species;

6) other relevant information;

7) written report documenting the assessment results.

If the Federal permitting action is not a major action significantly affecting the quality of the human environment, there is no need to prepare a biological assessment. However, it remains incumbent upon the Federal agency to assess whether its action may affect endangered and threatened species.

If the Federal agency determines that its proposed action may affect listed species, the Federal agency shall initiate the formal Section 7 consultation process by writing to the Regional Director, Region 2, U.S. Fish and Wildlife Service, P.O. Box 1306, Albuquerque, New Mexico 87103. If no effect is evident, there is no need for further consultation. However, I would appreciate the opportunity to review your biological assessment.

In addition, the Act (Sec. 7(a)(4)) requires Federal agencies to confer with the Service on any agency action likely to either jeopardize the continued existence of any species proposed for listing as endangered or threatened or adversely modify proposed critical habitat. The purpose of this requirement is to identify and to resolve at the early planning state of an action all potential conflicts between the action and the respective species and critical habitat. The informal Section 7 consultation process can accomplish this requirement.

Candidate species include those listed in a "Notice of Review" in the "Federal Register," those species which are in the process of being listed, or those which have been proposed for listing in the past but later withdrawn in order to comply to new regulations. Candidate species have no legal protection under the Endangered Species Act, and are included here only so that they may be considered in the planning process.

If you have need of further assistance, please call the Office of Endangered Species at (505) 766-3972 or FTS 474-3972.

Sincerely yours,

Regional Director

Attachment

cc: Field Supervisor, ES Field Office, Phoenix, Arizona
Field Supervisor, ES Field Office, Albuquerque, New Mexico
Field Supervisor, ES Field Office, Fort Worth, Texas
Field Supervisor, SE Field Office, Sacramento, California
Mr. Gerald E. Hillier, District Manager, BLM, Riverside, California

ALL-AMERICAN PIPELINE

Ehrenberg, Arizona to Midland, Texas

PIPELINE SEGMENT SHEET NUMBER	SPECIES	SPECIES CATEGORY* Listed E	T	CH	Proposed E/T	CH	Candidate
5	--Yuma clapper rail	X					
	Peregrine falcon	X					
	Bald eagle	X					
Alternate Route	--The above endangered species						
	Arizona cliffrose (*Cowania subintegra*)				X		
	Coryphantha vivipara var. *buoflama*						X
	Sclerocactus polyancistrus						X
6	--Peregrine falcon						
	Neolloydia erectrocentra var. *acunensis*						X
7	--Peregrine falcon						
	Yuma clapper rail						
	Mammillaria thornberi						
	Neolloydia erectrocentra var. *acunensis*						
8	--Peregrine falcon						
	Whooping crane	X					
	Gila chub						X
	Coryphantha robbinsorum						X
9	--Peregrin falcon						
	Coryphantha robbinsorum						
10	--Sneed's pincushion cactus (*Coryphantha sneedii* var. *sneedii*)	X					
11	--Sneed's pincushion cactus (*Coryphantha sneedii* var. *sneedii*)						
	Peregrine falcon						
12	--Peregrine falcon						

*E-endangered, T-threatened, CH-critical habitat

Candidate species have no legal protection under the Endangered Species Act but are species for which the Service has substantial information to support their listing as endangered or threatened. The development and publication of proposed rules for each species is anticipated. The candidate species are included in this document for planning purposes only.

HABITAT INFORMATION

Listed Species

Yuma clapper rail	- Inhabits marshes along Colorado River and reported from Picacho Reservoir, Arizona.
Peregrine falcon	- Breeds in cliff areas near water. A summer and winter inhabitant.
Bald eagle	- Breeds along Salt and Verde Rivers. Winters near major rivers and reservoirs Statewide.
Whooping crane	- Occasionally uses Wilcox Playa during winter.
Sneed's pincushion cactus	- Occurs in Franklin Mountains of New Mexico and Texas (southeast Dona Ana County, NM, and northwest El Paso County, TX). Inhabits limestone ledges in the desert and grasslands between 4,300 to 5,400 feet elevation.

Proposed Species

Arizona cliffrose	- Recorded from Burro Creek, Mohave County, Arizona, and inhabits limestone or gypsum soils in creosote-bursage habitats.

39—78571

California Desert District
1695 Spruce Street
Riverside, California 92507

1792 (ALL)
(C-068.2)

Mr. Ralph Swanson
Endangered Species Office
U. S. Fish and Wildlife Service
1230 N. Street, 14th Floor
Sacramento, California 94814

Dear Mr. Swanson:

The Bureau of Land Management, California Desert District hereby requests an updated list of official listed, proposed, or candidate threatened or endangered species, pursuant to Section 7 of the Endangered Species Act (50 CFR 402), which might be affected by construction of the Getty and Celeron/All American Pipelines across southern California from Tajiguas Creek to Blythe.

Since the first list was provided by your office in January 1984, alternative routes have been added to the project as the EIS process. The Santa Maria Canyon Alternative and the Desert Plan Alternative are now being evaluated for this proposal (see attached maps). It has also been 90 days since the initial list was provided.

The BLM will begin preparing the Biological Assessment in June 1984 and therefore requests informal consultation with FWS concerning potential effects on listed species.

Sincerely,

[illegible]

Gerald E. Hillier
District Manager

Enclosure

cc:
R. Olendorff - BLM, Sacramento
L. Foreman - BLM, Riverside

B.Haigh:rlw:6/8/84:C0C6A

California Desert District
1695 Spruce Street
Riverside, California 92507

1792
(C060.2)

JUN 2 5 1984

Mr. E. C. Fullerton
Regional Administrator
National Marine Fisheries Service
  Endangered Species
300 S. Ferry Street
Terminal Island, California 90731

Dear Mr. Fullerton:

The Bureau of Land Management, California Desert District, hereby requests a list of officially listed, proposed or candidate threatened or endangered marine mammals under your jurisdiction which might be affected by construction of the Getty and the Celeron/All American pipeline projects.

The Getty Pipeline proposal is dependent on the construction of the Getty Gaviota Consolidated Facility (see attached map); while the Celeron/All American pipeline would be a common carrier pipeline providing transport for existing and planned crude oil production on and off-shore in the Santa Barbara Channel.

Sincerely,

GERALD E. HILLIER

Gerald E. Hillier
District Manager

Enclosure

cc: T. Masigat - COE, Los Angeles
Regional Director - FWS, Albuquerque
Regional Director - FWS, Sacramento
M. Haderlie - FWS, Yuma

BRaich:df:6/25/84:C050E:C-060.2

California Desert District
1695 Spruce Street
Riverside, California 92507

1792 (ALL)
(C-060.2)

Mr. Jim Johnson
Endangered Species Office
U.S. Fish and Wildlife Service
P. O. Box 1306
Albuquerque, NM 87103

Dear Mr. Johnson:

The Bureau of Land Management, California Desert District hereby requests an updated list of officially listed, proposed, or candidate threatened or endangered species, pursuant to Section 7 of the Endangered Species Act (50 CFR 402), which might be affected by construction of the Getty and Celeron/All American Pipeline Project across southern Arizona, New Mexico and Texas from Blythe, Arizona, to McCamey, Texas.

Since the first list was provided by your office in January 1984, additional field work and alternative routes have been added to the project as a result of the EIS process. It also has been 90 days since the initial list was provided.

BLM's third-party contractor for the EIS, Environmental Research and Technology, Inc. (ERT), has conducted a field survey of the proposed pipeline route through the Franklin Mountains. Mr. Paul Knight, from the New Mexico Natural Heritage Program accompanied ERT to positively identify Sneed's pincushion cactus (Coryphantha sneedi var. Sneedi). No individuals or populations were found on the proposed construction ROW. However, a population of cactus which is most likely a hybrid cross of C. sneedi and C. strobiliformis occurs of the line.

An alternative route around the Kofa National wildlife Refuge, called the Brenda Alternative, has been added to the project. A second alternative, considering an extension of the pipeline to Freeport, Texas (rather than terminating at McCamey and using the existing Rancho pipeline), is also being considered. A map of the proposed route and these two alternatives is included with this letter.

The BLM will begin preparing the biological assessment in July 1984 and therefore requests continued informal consultation with FWS concerning potential effects on listed species.

Sincerely,

Gerald E. Hillier

Gerald E. Hillier
District Manager

Enclosure

cc:
C. Halverson - FWS, Albuquerque
L. Upham - FWS, Albuquerque
F. Olendorff - BLM, Sacramento
L. Foreman - BLM, Riverside

B.Haigh:rlw:6/8/84:CCC5A

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
California Desert District
1695 Spruce Street
Riverside, California 92507

IN REPLY REFER TO:
1792
(C-060.2)

Regional Director
National Marine Fisheries Service
Endangered Species
Southeast Regional Office
9450 Koger Blvd., Duval Bldg.
St. Petersburg, Florida 33702

Dear Sir:

The Bureau of Land Management, California Desert District, hereby requests a list of officially listed, proposed or candidate threatened or endangered marine mammals under your jurisdiction which might be affected by construction of the Celeron/All American pipeline project.

The Celeron/All American pipeline would be a common carrier pipeline providing transport for existing and planned crude oil production on and off-shore from the Santa Barbara Channel to Freeport, Texas. A map is attached.

Sincerely,

Gerald E. Hillier
District Manager

Enclosure

cc: C-930.15

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southwest Region
300 South Ferry Street
Terminal Island, California 90731

July 9, 1984

F/SWR31:DJS
1514-05

Mr. Gerald E. Hillier
Acting District Manager
Bureau of Land Management
California Desert District
1695 Spruce St.
Riverside, CA 92507

Dear Mr. Hillier:

This responds to your June 25, 1984, information request concerning endangered, threatened, or candidate species that may be affected by the proposed construction of the Getty and Celeron/All American pipeline projects.

The enclosed list indicates those species which may be present in the project area. As discussed with Mr. Larry Foreman of your staff, our Biological Opinions issued to the Minerals Management Service for the development and production of offshore oil and gas in the Santa Ynez Unit and Point Conception/Arguello Field considered potential impacts to these species from offshore operations including tanker transport, pipeline construction and operation, and mooring/docking facilities in the Gaviota region. (My staff forwarded copies of these opinions to your office on July 9, 1984). However, we anticipate that our agencies will need to conduct a consultation which considers the potential for impact to these species due to oil spills originating from land based pipeline failure or accident. We are looking forward to receiving copies of the DEIS and Biological Assessment for this project for our review.

If you have any further questions, please contact Mr. Dana J. Seagars of our Marine Mammal Program at (FTS) 796-2518 or (213) 548-2518.

Sincerely yours,

Rodney R. McInnis

for E.C. Fullerton
Regional Director

Enclosure

Species Which May Be Present in the Project Area

Common Name	Scientific Name	Status
Gray whale	(*Eschrichtius robustus*)	Endangered
Right whale	(*Eubalaena glacialis*)	Endangered
Blue whale	(*Balaenoptera musculus*)	Endangered
Fin whale	(*B. physalus*)	Endangered
Sei whale	(*B. borealis*)	Endangered
Humpback whale	(*Megaptera novaeangliae*)	Endangered
Sperm whale	(*Physeter macrocephalus*) [*catodon*]	Endangered
Grean sea turtle	(*Chelonia mydas*)	Endangered
Leatherback sea turtle	(*Dermochelys coriacea*)	Endangered
Pacific Ridley sea turtle	(*Lepidochelys olivacea*)	Endangered
Loggerhead sea turtle	(*Caretta caretta*)	Threatened
Guadalupe fur seal	(*Arctocephalus townsendi*)	Candidate
Northern fur seal	(*Callorhinus ursinus*)	Candidate

IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

SE

2-01-84-I-02

POST OFFICE BOX 1306
ALBUQUERQUE, NEW MEXICO 87103

JUL 3 1984

MEMORANDUM

TO: Mr. Gerald E. Hillier, District Manager, Bureau of Land Management, Riverside, California

FROM: Regional Director, Region 2 (SE)

SUBJECT: Updated Species List for Getty and Celeron/All American Pipeline

As requested in your June 25, 1984 letter, we have updated the threatened and endangered species list, as provided by the Endangered Species Act, for the subject pipeline segment across Arizona, New Mexico, and Texas. This supersedes our January 27, 1984 list.

The updated list (attached) largely reflects the improved maps furnished with this request. We have removed Sneed's pincushion cactus (Coryphantha sneedi var. sneedi) from the original list based upon your information from Mr. Paul Knight, New Mexico Natural Heritage Program, which stated this species does not occur within the pipeline right-of-way.

If you have need for further assistance, please call the Office of Endangered Species at (505) 766-3974 or FTS 474-3974

Attachment

cc: Field Supervisors, Ecological Services, Phoenix, Albuquerque, Fort Worth, Clear Lake and Corpus Christi w/attachment
HR, Region 2 w/attachment

GETTY AND CELERON/ALL AMERICAN PIPELINE

Blythe, Arizona to Freeport, Texas

PIPELINE SEGMENT SHEET NUMBER	SPECIES	SPECIES CATEGORY* LISTED E	T	PROPOSED	CANDIDATE
6-AZ portion	Yuma clapper rail	X			
"	Bald eagle	X			
Brenda Alternative --	The above species				
7	Mammilaria thornberi			X	
"	Neolloydia erectrocentra var. acunensis				X
"	Yuma clapper rail				
8	Peregrine falcon (Winchester Mountains)	X			
9	----				
10	----				
11	----				
12	----				
McCamery, Texas to Freeport, Texas					
Pecos County -	Suaeda duripes (w. of Bakersfield at Escondido Springs)				X
San Marcos Area -	Texas blind salamander	X			
	San Marcos salamander		X		
	San Marcos gambusia	X			
	Fountain darter	X			
	Texas wildrice	X			
Matagorda County -	Bald eagle (Phillips reservoir near West Columbia. The Colorado River has additional territories)				

* - E = endangered, T = threatened

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Region
9450 Koger Boulevard
St. Petersburg, FL 33702

July 11, 1984 F/SER23:AM

Mr. Gerald E. Hillier
Acting District Manager
Bureau of Land Management
California Desert District
1695 Spruce Street
Riverside, CA 92507

Dear Mr. Hillier:

This responds to your July 3, 1984, letter requesting a list of threatened or endangered species under our jurisdiction that may be affected by construction of the Celeron/All American pipeline project between the Santa Barbara Channel and Freeport, Texas.

The enclosed list provides the threatened and endangered species under our purview which occur in the Gulf of Mexico. However, if the proposed pipeline will not extend into marine waters off Freeport, none of these species would be involved.

If you have any questions, please contact me at FTS: 826-3366.

Sincerely yours,

Andreas Mager, Jr.

Andreas Mager, Jr.
Fishery Biologist
Protected Species Management Branch

Enclosure

Endangered and Threatened Species and Critical Habitats Under NMFS Jurisdiction

Gulf of Mexico

LISTED SPECIES	Scientific Name	Status	Date Listed
finback whale	*Balaenoptera physalus*	E	12/2/70
humpback whale	*Megaptera novaeangliae*	E	12/2/70
right whale	*Eubaleana glacialis*	E	12/2/70
sei whale	*Balaenoptera borealis*	E	12/2/70
sperm whale	*Physeter catodon*	E	12/2/70
green sea turtle	*Chelonia mydas*	Th/E	7/28/78
hawksbill sea turtle	*Eretmochelys imbricata*	E	6/2/70
Kemp's (Atlantic) ridley sea turtle	*Lepidochelys kempi*	E	12/2/70
leatherback sea turtle	*Dermochelys coriacea*	E	6/2/70
loggerhead sea turtle	*Caretta caretta*	Th	7/28/78

SPECIES PROPOSED FOR LISTING
None

CRITICAL HABITAT
None

CRITICAL HABITAT PROPOSED FOR LISTING
None

APPENDIX C

SOCIOECONOMIC ASSUMPTIONS

TABLE C-1

IMPACT ASSUMPTIONS

CELERON/ALL AMERICAN CONSTRUCTION WORK FORCE

Pipeline Spread	Las Flores-Emidio (1)	Emidio-Blythe (2)	Blythe-Coolidge (3)	Coolidge-Lordsburg (4)	Lordsburg-Salt Flats (5)	Salt Flats-McCamey (6)
Total Miles	122	303	186	182	211	202
Milepost		303	489	671	882	1,084
Construction Crew[1]						
Pipeline Workers	279	335	335	335	335	335
Pump Station Workers	(3) 60	(4) 80	(3) 60	(3) 60	(2) 40	(2) 60
Valve Workers	8	8	8	8	8	8
River Crossings	50		125	50	50	50
Tank Farm		75				
Total	397	498	528	453	433	453
Time Schedule	Months	Months	Months	Months	Months	Months
Pipeline (1.5 mi/day)	2.8	6.7	4.1	4.0	4.7	4.5
Pump Station	6.0	6.0	6.0	6.0	6.0	6.0
Valves	1.4	1.0	0.8	0.4	0.7	0.8
River Crossings	3.0		2.5	1.0	1.0	1.0
Tank Farm		8.0				
Local Labor Force %[3]	50%	50%	30%	30%	30%	50%
Total	198	249	158	136	130	227
Non-local Labor Force %	50%	50%	70%	70%	70%	50%
Total	199	249	370	317	303	226
Dependents (0.3/non-local[4] worker)	60	75	111	95	91	68
Total Non-local Population	259	324	481	412	394	294
Lodging Requirements[3]						
Rental Units (26%)	52	65	96	82	79	59
Motel/Hotel (42%)	84	104	155	133	127	95
Recreational Vehicle (28%)	56	70	104	89	85	63
Other (4%)	8	10	15	13	12	9
Weekly Expenditures by Non-local Labor Force[2,3]						
Rental Unit/Motel Dwellers	$54,400	$67,600	$100,400	$86,000	$82,400	$61,600
R.V. Dwellers & Other	$12,800	$16,000	$23,800	$20,400	$19,400	$14,400

[1]Crew totals: Check/block valves - 8 workers, 3 days; River crossings: Colorado - 75 workers, 6 weeks; small rivers - 50 workers, 6 weeks; Cadiz tank farm - 75 workers, 8 months; Pump stations - 20 workers, 6 months. Numbers in parentheses represent number of pump stations (Celeron/All American).

[2]Rental unit and motel dwellers are estimated to spend $400/week; R.V. dwellers and others are estimated to spend $200/week.

[3]ERT

[4]Construction Worker Profile, Mountain West Research, Inc. 1979.

TABLE C-2

IMPACT ASSUMPTIONS

GETTY CONSTRUCTION WORKERS

		Pipeline Spread		
		1	2	3
Pipeline Workers[1]		56	56	56
Pump Station Workers		20	20	20
Valve Workers		8	8	8
Total		84	84	84
Local Labor Force[2]		50%	50%	50%
Total		42	42	42
Non-local Labor Force		50%	50%	50%
Total		42	42	42
Dependents (0.3/non-local worker)[3]		13	13	13
Total Non-local Population		55	55	55
Lodging Requirements:[2]				
Rental Units	(26%)	11	11	11
Motel/Hotel	(42%)	18	18	18
Recreational Vehicles	(28%)	12	12	12
Other	(4%)	1	1	1
Estimated Weekly Expenditures by Non-local Labor Force[4]				
Rental Unit/Motel Dwellers		$11,600	$11,600	$11,600
R.V. and Other Dwellers		$ 2,600	$ 2,600	$ 2,600

Sources:

[1]Getty

[2]ERT

[3]Construction Worker Profile

[4]Weekly local expenditures per non-local construction worker are estimated at $400/week for rental unit and motel dwellers, and $200/week for R.V. and other dwellers.

APPENDIX D

AREAS UNDER CONSIDERATION FOR WILDERNESS CLASSIFICATION

APPENDIX D

AREAS UNDER CONSIDERATION FOR WILDERNESS ADJACENT TO OR CROSSED BY THE PROPOSED PIPELINES

Introduction

There are nine areas in California and four in Arizona under consideration for wilderness designation that are crossed or adjacent to the proposed Getty or Celeron/All American pipeline and transmission line corridors (Table D-1). Map D-1 shows Los Padres National Forest (LPNF) Roadless Area Review Evaluation (RARE II) Further Planning Areas (FPAs) in or near the Celeron/All American and Getty pipeline routes along La Brea Creek. Map D-2 displays the location of BLM Wilderness Study Areas (WSAs) and Areas of Critical Environmental Concern in the California Desert. One of these WSAs would be crossed by All American's proposal and one would be crossed by the Desert Plan Alternative. There are three BLM WSAs in Arizona which are immediately adjacent to the proposed route east of the Kofa National Wildlife Refuge (NWR), as shown on Map D-3. In addition, another BLM WSA north of the refuge would be crossed by the Brenda Alternative.

The Wilderness Act of 1964 (Public Law 88-577) specifies that Federal land management agencies must inventory their lands for suitability as wilderness and make recommendations to Congress for additions to the Wilderness System.

The Act defines land suitable for wilderness as an area of undeveloped Federal land that has the following characteristics:

- It is affected primarily by the forces of nature, where man is a visitor who does not remain. It may contain ecological, geological, or other features of scientific, educational, scenic, or historical value;

- It possesses outstanding opportunities for solitude or a primitive and unconfined type of recreation;

- It is an area large enough so that continued use will not change its unspoiled, natural condition;

- It provides the opportunity for (and often requires) self-reliance and meeting challenges.

In 1979 the RARE II was undertaken by the Forest Service; the study proposed areas for wilderness and identified areas of further planning (FPAs) and areas that did not meet minimum requirements for wilderness. FPAs were to be studied and a decision on their suitability for wilderness made during the forest planning process or by wilderness legislation. The LPNF is now drafting its Forest Land Management Plan, but it will not be completed until at least 1985 (Rose 1984, personal communication).

TABLE D-1

AREAS UNDER CONSIDERATION FOR WILDERNESS CLASSIFICATION

California

Los Padres National Forest:

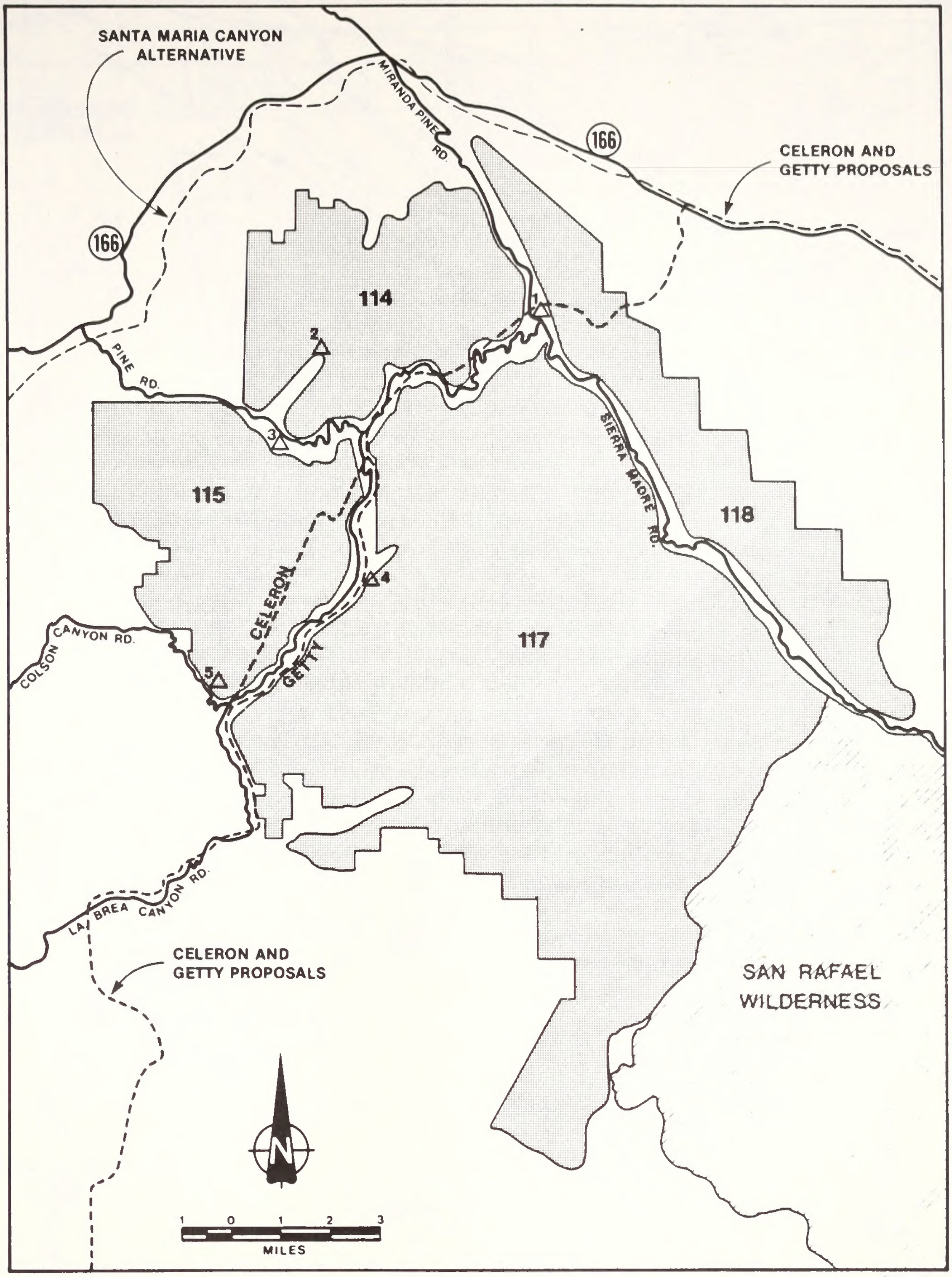
Miranda Pine Roadless Area 114
Horseshoe Springs Roadless Area 115
La Brea Roadless Area 117
Spoor Canyon Roadless Area 118

California Desert:

Amboy Crater WSA 304A
Palen/McCoy WSA 325
Old Woman Mountains WSA 299
Ship Mountains WSA 300
Coxcomb Mountains WSA 328

Arizona

Little Horn Mountains East WSA 2-127
Eagletail Mountains WSA 2-128
North Maricopa Mountains WSA 2-157
New Water Mountains WSA 2-125



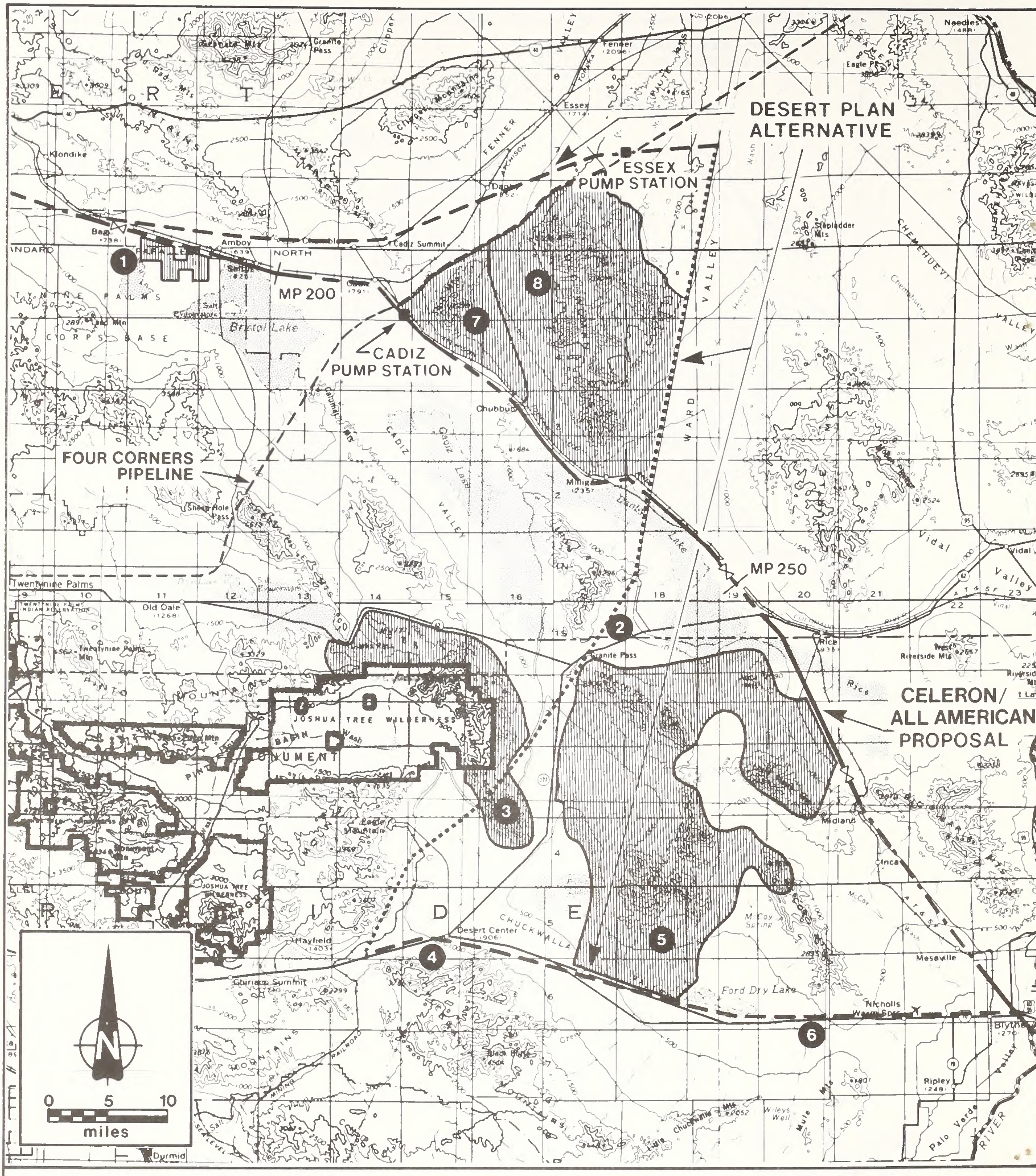
FOREST SERVICE FURTHER PLANNING AREAS

114 Miranda Pine
115 Horseshoe Springs
117 La Brea
118 Spoor Canyon

△ CAMPGROUNDS

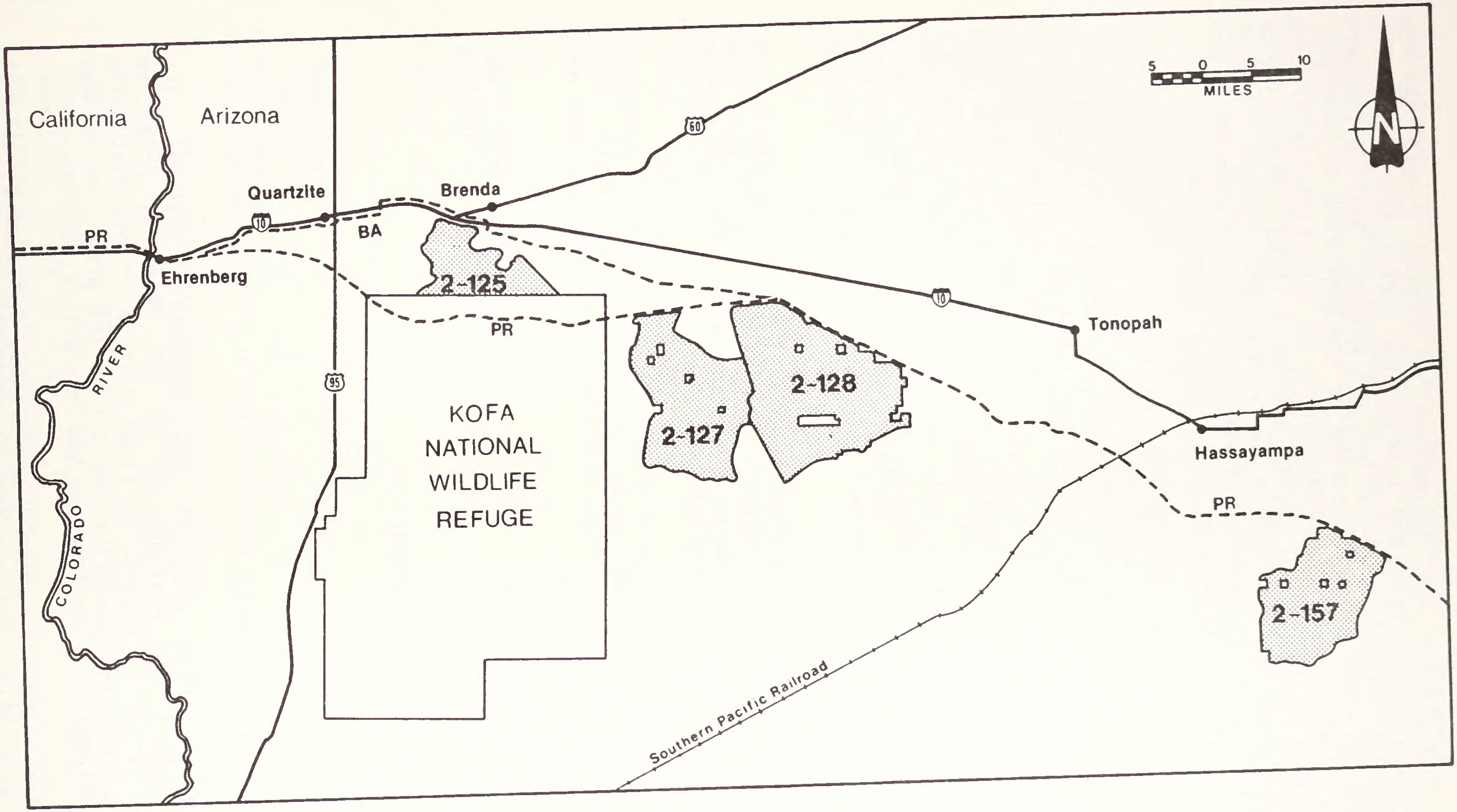
1. Miranda Pine
2. Brookshire Springs
3. Horseshoe
4. Wagon Flat
5. Barrel Springs

MAP D-1 FURTHER PLANNING AREAS CROSSED BY, OR ADJACENT TO, PROPOSED PIPELINE ALTERNATIVES



1. Amboy Crater Wilderness Study Area (WSA)
2. Patton's Camps Area of Critical Environmental Concern (ACEC)
3. Coxcomb WSA
4. Alligator Rock ACEC
5. Palen-McCoy WSA 325
6. Chuckwalla Valley Dune Thicket ACEC
7. Ship Mountains WSA
8. Old Woman Mountains WSA

MAP D-2 BLM WILDERNESS STUDY AREAS AND AREAS OF CRITICAL ENVIRONMENTAL CONCERN



PR — CELERON/ALL AMERICAN PROPOSAL

BA — BRENDA ALTERNATIVE

BLM WILDERNESS STUDY AREAS

2-125 New Water Mountains
2-127 Little Horn Mountains
2-128 Eagletail Mountains
2-157 Maricopa Mountains

MAP D-3 BUREAU OF LAND MANAGEMENT WILDERNESS STUDY AREAS CROSSED BY, OR ADJACENT TO, PROPOSED PIPELINE ALTERNATIVE ROUTES

In 1981 legislation was introduced to create Forest Service wilderness areas in California and resolve the uncertainity about the management of FPAs. This legislation was not passed. Until wilderness legislation for California is forthcoming or the LPNF Plan is complete, the wilderness characteristics of FPAs cannot be significantly altered without a detailed environmental impact statement (EIS). This interim status does not preclude development in a FPA, but requires careful consideration of how the project would affect the area's uniqueness and suitability for wilderness (Wenstrom 1984, personal communications).

The BLM also began a wilderness inventory process in 1978. In the California Desert Conservation Area final WSAs were defined and an EIS was drafted in 1979 (BLM 1979). The Phoenix, Arizona District of BLM is preparing a Resource Management Plan for the Lower Gila South Planning Unit. Preliminary recommendations addressing suitability or nonsuitability for wilderness will be part of this plan. No legislation concerning designation of BLM wilderness areas in California or Arizona has been introduced; therefore, all WSAs are being managed under the Interim Management Policy. This national policy states that until Congress acts, WSAs must be managed so as not to impair their suitability for wilderness. Specifically, no new permanent right-of-ways (ROWs) can be established (Hanson 1984, personal communication).

The following discussion describes the FPAs and WSAs crossed by the Celeron/All American and Getty proposals and analyzes the effects that pipeline construction and operation would have on the wilderness potential of Forest Service FPAs and BLM WSAs.

The analytical approach utilized is based on guidelines provided by the Forest Service (Wenstrom 1984 and FS 1980) and BLM (BLM 1981). FPAs and WSAs crossed by the pipeline are given greater attention than are WSAs adjacent to the proposed route.

For each of the areas under consideration as FPA or WSAs, the discussion addresses impacts to the following wilderness characteristics:

1) Integrity and natural appearance

2) Solitude

3) Primitive recreation

4) Special natural features

In addition to these physical and biological features, the discussion will detail the availability of and need for primitive recreation in the forest or region. A final portion of the discussion will focus on the possible cumulative impacts on the area's wilderness character from development of the proposed ROW as a utility corridor.

Effects on the integrity, natural appearance, and special natural features of an area were analyzed through interpretation of aerial photography, field checks by agency personnel, and review of findings of the Noise and Visual Resources Sections of the EIR/EIS. The Forest Service Recreation Opportunity Spectrum (ROS) was utilized to quantify changes in the natural setting. The opportunities for solitude were addressed in a similar manner. Primitive recreation was based on historic use trends and the capability of the areas for additional use. Interviews with agency personnel and recreation use statistics were the principal sources of data for this task.

Analysis of the demand for wilderness was undertaken by assessing the availability of other nearby wilderness areas, proximity to urbanized areas, and recreation use projections for specific recreational activities and settings (ROS classes).

Cumulative impacts were addressed by collecting data on typical space requirements for various utility corridors and imposing these on the terrain of the pipeline route. Results of the Visual Resources Section of the EIR/EIS were then applied to assess changes to the area's natural appearance.

Los Padres National Forest, California

Miranda Pine Roadless Area 114

Description. The Miranda Pine Roadless Area consists of 12,600 acres of public land located within the Santa Lucia Ranger District in the Sierra Madre Mountain Range. It is located 25 air-miles east of Santa Maria. The topography consists of a major drainage known as Pine Creek and a portion of La Brea and Aliso Creeks. The slopes are relatively steep with gentle ridge tops. The area contains numerous side canyons. The elevation ranges from 1,400 ft at lower Pine Canyon to 3,900 ft at Miranda Pine Spring.

The vegetation includes an isolated conifer stand on top of Miranda Pine Mountain. Fourteen percent of the area is oak-grassland, 17 percent is mixed chaparral, and 63 percent is the other chaparral type. Thirty-seven percent of the vegetation is in the 11 to 30-year age class and 63 percent is in the over 31-year age class.

It is estimated that there are 2,400 visitor days used annually. This use is attributed to deer hunting and hiking activity. The Plow Share Spring Trail Camp has been used in the past by hikers. Brookshire Campground, located at the end of Brookshire Road, is outside the area but adjacent to the boundary. Horseshoe Spring and Miranda Pine campgrounds are also located adjacent to the boundary.

The northwest portion of the area is good range land and presently sustains 850 animal unit months (AUM) within two grazing allotments. A major fuel break is in the northeast and south portion of the area. There are three cabins on private land near Porter Peak. A lateral fuel break extends 1 mile north into the area off Treplett Mountain. In addition, there is a 1-mile fuel break that extends from Pine Mountain to Treplett Mountain. An 800-acre area was prescribed burned in 1972 in the vicinity of Horseshoe Springs. There are 11 miles of jeep road used for fire and grazing administration. The Plowshare radio electronics facility is located on Plowshare Peak along the east side of the area. Although it is not within the boundary, it is a prominent feature in the area.

There are two known archaeological sites in the area. Grazing permits are the only special use contracts issued within the FPA.

ROS classification for the area is categorized as follows; 24 percent of the area semi-primitive non-motorized, 25 percent is semi-primitive motorized, and 51 percent is roaded natural.

The proposed route follows along Miranda Pine Road until the Treplett Mountain vicinity where it diverges and crosses into the FPA and goes along a ridge before leaving the FPA near Miranda Pine campground. A total of 1.4 miles of ROW would be in this FPA. Construction would entail disturbance to a 100-ft wide corridor. Maintenance activities would include at least twice-weekly pipeline overflights, along with unscheduled on-the-ground inspections.

Integrity and Natural Appearance. The area has five small scattered private parcels which are unsurveyed and unmarked on the ground. One parcel (Porter Peak) contains a recreation cabin. Portions of the north and west side boundaries follow legally described locations rather than definable topographic features.

The natural appearance of the area has not been altered except for jeep roads in the northwest portion of the area. The surroundings are also natural appearing in character. The area provides very good habitat for mule deer. There is potential habitat for the spotted owl. The Brookshire Spring area has provided marginal fishing in Pine Creek in the past. Miranda Pine Mountain sustains a stand of Coulter pine which attracts visitors.

The proposed pipeline ROW appearance has been altered considerably. A fuel break consisting of cleared brush and revegetated grass currently exists along the pipeline corridor. According to Forest Service Visual Quality maps, the corridor where it passes through the FPA is Classes IV, V, and VI areas of moderate, major, and drastic visual modification. Another intrusion visible from the proposed ROW is the Miranda Pine Road, less than 0.5 mile distant. Results of the Visual Resource analysis show that pipeline construction would not significantly change the visual quality or natural appearance of the corridor within the FPA once revegetation has begun, compared to current visual conditions.

Integrity of the FPA should remain about what it is now after construction because the corridor would cross only the eastern edge of the FPA and be confined to an existing fuel break. The central portion of the FPA, Pine Canyon, would remain untouched by project construction or maintenance.

Solitude. Opportunities for solitude are presently limited due to the presence of nearby trails and roads. Pipeline construction would have short-term impacts on solitude due to equipment noise (see the Noise Section). Once completed, pipeline effects on the area's solitude would be minimal, with occasional airplane overflights being the greatest potential disturbance.

Primitive Recreation. Opportunities for primitive recreation are limited due to the steep topography and lack of trail access. No major challenging experiences are present except for cross country hiking along ridge tops and canyon bottoms. The area is 6 miles long and 4.5 miles wide.

Of interest is the marine sedimentary deposit near the vicinity of Horseshoe Springs. This area contains fossilized shark teeth. The Horseshoe Springs Campground, located outside but adjacent to the area, was the former site of the CCC Camp used as a base to construct campgrounds, roads and trails in the area.

Hiking, hunting, and ORV use are the most common recreational activities in the FPA. Pipeline construction would not greatly affect these opportunities unless disturbance occurred during hunting season. Public motor vehicle access from the ROW would result in increased recreational use. This increase, however, is not expected to be large because of the ROW's proximity to the Miranda Pine Road.

The pipeline corridor is entirely within the Roaded Natural Area classification of the ROS. This means there would be no change from existing ROS conditions after project completion.

Special Natural Features. One of the most notable natural features within or adjacent to the FPA is an isolated conifer stand on top of Miranda Pine Mountain. Pipeline ROW clearing would remove some of this stand.

Availability and Need. The Miranda Pine FPA is located in a region which contains a large amount of designated wilderness (ROS "primitive" classification) and areas with semi-primitive non-motorized characteristics. The 149,000-acre San Rafael Wilderness, which receives 40,000 visitor days of use annually, and the 61,000-acre La Brea FPA are directly east of the FPA. Other FPAs are to the north and south. Information collected for the Draft Los Padres Forest Plan Forest Service, in preparation) estimates that the practical capacity for primitive recreation for the entire forest is 35.3 million recreation visitor-days (RVD).

The forest-wide estimated demand for recreation use in areas with primitive recreational opportunities is projected to be 23 million RVD in 1990, increasing to 34 million RVD by 2030 (Forest Service, in preparation). Projected primitive recreation use, therefore, is expected to be less than the resource capacity.

Horseshoe Springs Roadless Area 115

Description. The Horseshoe Springs Roadless Area contains 13,300 acres of public land located within the Santa Lucia Ranger District in the Sierra Madre Mountain Range. It is located east of Santa Maria by a distance of 20 air-miles. The topography consists of a major drainage known as Bear Canyon, Buckhorn Ridge, and a minor drainage known as Buckhorn Canyon. The slopes are relatively steep and ridge tops are gentle. The entire area was originally uplifted and bedrock compressed into folds which increase in intensity toward the eastern part of the area. The elevation ranges from 1,000 ft at Buckhorn Canyon to 3,000 ft at an unnamed peak on Peach Tree Ridge.

The vegetation consists of 5 percent in the oak-grassland type, 27 percent mixed chaparral, and 70 percent in the other chaparral. Thirteen percent of the vegetation is in the 11 to 30-year age class and 87 percent is in the over 31-year age class. It is estimated that there are 2,500 visitor days used annually. This use is attributed to deer hunting, hiking, and ORV use. Five ORV routes that total 10 miles are located in the area. Bear Canyon trail is occasionally used by hikers. Horseshoe Spring, Colson, and Wagon Flat Campgrounds are located outside of the area but adjacent to the boundary. A portion of the area is good range land and presently sustains 190 AUM within 3 grazing allotments. A 1-mile portion of Treplett fuel break is in place along the northeast side of the area. The Antolini Rock Quarry, although not located within the area, is a prominent feature adjacent to the west side of the area. There are five known archeological sites in the area of unknown significance. There are no special use permits issued within the area except for grazing allotments.

ROS classification is categorized as follows: 77 percent of the area is semi-primitive motorized, and 23 percent is roaded natural.

The Horseshoe Springs FPA would be directly impacted by the Celeron/All American La Brea Canyon route. The ROW first crosses into the FPA near the junction of Bear and La Brea Canyons. It continues along an unmaintained trail on top of the unnamed ridge dividing Bear and La Brea Canyons. At its meeting with the Buckhorn Ridge ORV trail, it descends to the La Brea Canyon Road and out of the FPA. A total of 5 miles of ROW are within the FPA.

The proposed Getty route follows along La Brea Creek, just east of the FPA boundary. Construction along this route would have only indirect impacts on the FPA because the proposed route would not cross the FPA.

Integrity and Natural Appearance. The area has one private parcel within its boundary. This parcel contains a year-round residence and access road. The north and northwest boundaries follow along legally described locations rather than definable topography features. The overall natural integrity has not been too greatly compromised. The appearance of the area is natural except for jeep roads in the north portion.

One such unmaintained trail is the location of the Celeron/All American ROW. This trail is difficult to observe because of dense brush and it does not detract greatly from the natural character. Forest Service visual quality maps designate the ROW as Class I, meaning pristine conditions. Scenic intrusions possible from the ridge top where the ROW would pass are segments of the La Brea Canyon and Colson Canyon Roads, as well as the Buckhorn Ridge and Bear Canyon ORV trails.

Results of the visual resource impact assessment show that pipeline construction would drastically alter existing visual conditions along the ROW within the FPA. The Visual Condition Class would change from Class I (pristine) to Class V (major disturbance). A portion of this change would be visible from the Bear Canyon trail.

Integrity of the FPA would be reduced somewhat by the introduction of landscape changes visible to users of the Bear Canyon trail. Portions of the last 2.4 miles of the ROW would be within sight of trail recreationists. This canyon is the principal drainage and "heart" of the Horseshoe Springs FPA.

Solitude. The FPA's size, deep canyons, and dense vegetation offer moderate opportunities for solitude. Noise from construction of the Celeron/All American ROW would be very noticeable during the week of ROW preparation, ditching, and backfilling (assumes ROW clearing would be performed several days in advance of ditching, and construction would progress at 1.5 miles per day). See the Noise Section of the EIR/EIS for detailed information on equipment noise. Long-term effects on solitude within the FPA would be related to public motorized use of the maintenance road and overflights of the ROW.

The maintenance road would provide increased public access to the FPA. Motorized use adjacent to the FPA would reduce the opportunities for solitude because of associated visual and noise effects. A large portion of current recreational use, however, is motorized ORV use.

Primitive Recreation. Primitive types of recreation, such as hiking and hunting along ridge tops and canyon bottoms, along with motorized recreation by ORV users, accounts for about 2,500 visitor use days in the FPA. Hikers occasionally backpack along the Bear Canyon trail, but for the most part ORVs use the five principal trails in the FPA. The area is 6 miles long and 3.5 miles wide. Pipeline construction would not significantly reduce primitive recreation opportunities, unless it occurs during the deer hunting season.

Pipeline construction would result in a shift of 485 acres from the semi-primitive motorized (SPM) ROS category to the roaded natural area classification. This represents a 5 percent decrease in the SPM acreage within the FPA. It also results in a less than 1 percent decrease in the SPM acreage for the entire LPNF.

Special Natural Features. There are no significant natural attractions to the area.

Availability and Need. The private land road access into Buckhorn Ranch would present a non-conforming use in the area if it were designated as wilderness. In addition, there are several buildings on this 40-acre parcel.

The availability of primitive recreational opportunities in the region containing the FPA is the same as described for the Miranda Pine FPA. About 10 air-miles east of the FPA is the San Rafael Wilderness.

Forest-wide projected demand for primitive recreation is expected to be less than the resource capacity through the year 2030. Demand for roaded natural opportunities, however, is expected to exceed supply before the year 2030 (FS 1984).

La Brea Roadless Area 117

Description. The La Brea Roadless Area totals 61,000 acres of public land and is located on the Santa Lucia Ranger District within the Sierra Madre Mountain Range. The topography is extremely steep. It is bisected by numerous canyons which drain into the North Fork of La Brea Creek and the Sisquoc River. The elevation rises to an excess of 3,000 ft on the northeast portion along the Sierra Madre Ridge. The elevation at the lowest point is 1,100 ft in the lower Sisquoc and the lower La Brea drainages. Three percent of the area is composed of oak-woodland, 10 percent grassland, 23 percent mixed chaparral, and 73 percent other chaparral. Ninety-six percent of the area is over 31 years of age. Four percent is in the 0 to 10-year age class.

Recreation use is estimated at 6,000 visitor days. There are five trail camps in the area; some have not been used or maintained. The use is associated with hunting around the perimeter, and ORV use on the Kerry Canyon trail. The majority of use occurs in the lower Manzana School House area in conjunction with day and overnight hiking. There is 1 mile of jeep road in the lower Manzana, 2 miles of jeep road to the White Elephant Mine, 5 miles of ORV route for motorcycle use in Kerry Canyon, and 1.5 miles of maintained hiking trail in the area. There is an additional 30 miles of unmaintained hiking trail not improved since 1960. There is a more heavily used trail approximately 2 miles in the lower Manzana Creek which borders the area as well as the San Rafael Wilderness. The White Elephant Mine is located in Section 8, T10N, R30W. It was initially developed for its barite content but has been inactive for at least 20 years. There are portions of three range allotments that support 1,305 AUMs in the area. The Dabney cabin located along the Manzana River is within the FPA. It has been in place for at least 69 years. The cabin is designated as a County historical site, but its significance with regard to the National Register of Historic Places has not been determined. There are four known archaeological sites in the area. No special use permits have been issued, except for grazing allotments.

ROS classification is as follows: 67 percent of the area is semi-primitive non-motorized, 19 percent is semi-primitive motorized, and 13 percent is in the roaded natural category.

None of the pipeline routes would directly cross into the La Brea Roadless Area. Therefore, impacts to the FPA would be limited to indirect effects, principally visual, noise, and increased access.

Integrity and Natural Appearance. The natural integrity and appearance of the area have not been altered significantly. Some minor infringements have occurred along the periphery of the area.

The Sierra Madre fuel break is located on the northeast side of the area and the Treplett fuel break is on the north side of the area. The area is bounded by the San Rafael Wilderness along the southeast side. The south side is bounded by private land parcels. The west boundary is along the La Brea Canyon road. The historic school at the forks of the Manzana and Sisquoc Rivers is a well known local attraction. There is a historical condor roost area along Pine Ridge in the vicinity of Sierra Madre Road.

The pipeline would not disturb the natural appearance or integrity of the FPA.

Solitude. The area offers outstanding opportunities for solitude in canyon bottoms, especially in the South Fork, La Brea, and Horse Canyon areas. Only minor disturbance to the area's solitude can be expected. Noise effects, especially where blasting is required, would be present during the approximately two weeks when construction activity is occurring in La Brea Canyon (assumes 1.5 miles of construction per day plus site preparation time over the 12-mile length). The majority of back-country users would be screened from construction noise by terrain. Once completed, pipeline effects on the area's solitude would be minimal, with occasional airplane overflights being the greatest potential disturbance.

Primitive Recreation. The opportunities for primitive recreation also are plentiful along the canyon bottom, little used trails and trail camps in the area. There are a number of challenging experiences that visitors can encounter especially if one desires to travel cross country. The area is one of the larger roadless areas inventoried in the Santa Lucia Ranger District. The area is 16 miles long and 12 miles wide. Its size allows many opportunities to escape the sight and sounds of humans. The area contains condor habitat and some spotted owl habitat. The area does not contain any identified sensitive plant species. The historical school house, Dabney Cabin, and old homesteads are located on the lower Sisquoc drainage. Included are a few gravel sites in the same vicinity.

There would be no significant adverse effects on primitive recreational opportunities in the FPA from construction or operation, except in the case of motorized access. During construction public access to the La Brea Canyon would be difficult and delays common. Access, however, is available from other roads, such as the Manzana School Road.

Improved road access to La Brea Canyon and adjoining trails into the FPA would occur after construction is complete, allowing increased use of backcountry trails.

Special Natural Features. There are no unique natural features within the FPA that would be disturbed by construction.

Availability and Need. The Ventana Wilderness is located 2.5 hours driving time from this area; the Santa Lucia Wilderness is located 1.5 hours driving time from the area. The San Rafael Wilderness is located adjacent to the area; use in the San Rafael Wilderness is 90 percent local users. The area is midway between the metropolitan areas of San Francisco and Los Angeles.

There would be no change in the ROS classification within the FPA from construction of the pipelines. The FPA is contiguous with the San Rafael Wilderness to the east.

Spoor Canyon Roadless Area 118

Description. The Spoor Canyon Roadless Area consists of 12,300 acres of public land located with the Santa Lucia Ranger District along the northeasterly portion of the Sierra Madre Range. The topography consists of a dominant northeast facing frontal range with minor side ridges. The canyons face in an east-west direction. The elevation ranges from 1,800 ft in the northeast portion to 5,000 ft in the southeast portion in the vicinity of Spoor Peak.

Vegetation consists of 3 percent pinyon-juniper type, 3 percent oak-woodland, 1 percent grassland, 52 percent mixed chaparral, and 41 percent is the other chaparral. Ten percent of the vegetation is in the 11 to 30-year age class, and 90 percent is in the over 31-year age class.

The present use is estimated to be 1,000 visitor days. There are no trails or trail camps in the area. Most of the use occurs around the periphery of the area. Some use takes place during the deer hunting season along the more open ridge tops and canyon bottoms. There are no live streams in the area.

The northeastern slope of the Sierra Madre range drains into the Cuyama River within the Cuyama Valley. The slopes have a uniform appearance in that there is little variety in the vegetation cover. There are no major attractions to the area.

A number of fresh water springs are present in the major canyons along the foothills. These springs attract a wide variety of wildlife. Three small spring-associated camps are present along the southeast portion of the area. Mule deer are the primary big game species in the area. Mountain lion and black bear are also present. Small game species include mountain and valley quail along with cottontail rabbit found along the eastern slopes. The spotted owl occurs in many of the deeper canyon bottoms where an overstory of large mixed chaparral has developed. There are no threatened or endangered species in the area nor are there any sensitive plants identified. There are no range allotments in the area.

ROS classification is categorized as follows: 62 percent of the area is semi-primitive motorized and 38 percent is roaded natural.

The Spoor Canyon FPA would be directly crossed by the applicant's proposed route. A total of 1.8 miles of ROW beginning southeast of Miranda Pine Campground would be within the FPA. The route would descend very steep slopes before leaving the FPA at the forest boundary in the Cuyama Valley.

Integrity and Natural Appearance. The natural integrity or the natural appearance of the area has been substantially affected by humans. The major Sierra Madre fuel break and the Sierra Madre Road form the western edge of the roadless area. The interior of the area has not been affected except for minor work along a few ridge tops. The area is 1.5 miles in width and 12 miles long. This elongated configuration substantially affects the potential for wilderness designation.

The proposed ROW within the FPA follows an unmaintained overgrown trail for most of its length. Forest Service visual condition maps display the corridor as Class III, an area of minor change from natural conditions. Extensive views of the Cuyama Valley are possible from the higher ridges.

Results of the visual resource impact assessment show that pipeline construction would change the corridor's visual conditions from Class III to Class V. Even with visual mitigation measures the ROW would be highly visible to observers in the Cuyama Valley and the Miranda Pine Campground (see Figure 4-6).

Integrity of the FPA would be compromised by the proposed route because approximately the upper 30 percent of the 12,300-acre FPA would be separated from the southern 70 percent. This northern segment, after construction, would probably be too small an area to meet the criteria for wilderness designation.

Solitude. There are not many opportunities for solitude in the area except as provided by cross country travel or hiking up the more accessible canyon bottoms. The width of the area restricts the ability to traverse very deep into the area.

Noise from construction of the pipeline would reduce such opportunities during the approximately one week when activity is within or adjacent to the FPA. Noise impacts from airplane overflights would further limit chances to escape from the presence of man.

Primitive Recreation. Some opportunities for primitive recreation exist, especially related to cross country travel. Because of the steep terrain and dense cover, challenging experiences are plentiful.

Short-term impacts on hunting would occur if construction commences during the season. Opportunities for other types of primitive recreation would not be significantly affected.

Pipeline construction would result in a shift of 718 acres from the semi-primitive motorized ROS class to the roaded natural classification. This change represents a 9 percent decrease in SPM land within the FPA and a less than 1 percent decrease in the forest.

Special Natural Features. There are no special features in the area or within the pipeline ROW nor are there any known archeological sites.

Availability and Need. No recreation developments are present in the area. Some hang gliding occurs from Plowshare Peak across the FPA to the Cuyama Valley. There is a 5-acre pine plantation established adjacent to the Sierra Madre fuel break just north of Miranda Pine Mountain. The pipeline would remove most of this plantation. Some potential exists for type conversion, for grazing benefits in the lower slopes in conjunction with the private ranch holdings.

Plowshare Peak is a major electronic site located immediately adjacent to the area along the Sierra Madre Ridge road. A 1.5-mile powerline is located east of Plowshare Peak. It extends through the area and exits the Forest boundary in the Cuyama Valley. A number of water developments exist along the boundary. Two formerly maintained trails (from Miranda Pine to Forest boundary and Sierra Madre Ridge to White Oaks station) are in place. They are infrequently used by hunters.

The Santa Lucia Wilderness is located one hour driving time from the roadless area. The 149,000-acre San Rafael Wilderness is separated from the area by the Sierra Madre Road and fuel break. Annual use is recorded at 43,000 visitor days. The roadless area is midway between the metropolitan areas of San Francisco and Los Angeles.

California Desert
Amboy Crater WSA 304A

Description. The proposed Celeron/All American pipeline route would be adjacent to but not within the northern boundary of this WSA. Therefore, impacts to the WSA would be limited to indirect effects, principally visual impacts and noise from construction.

Integrity and Natural Appearance. There would be no disturbance to the WSA. Management of the WSA would not be affected because no new roads are created.

Solitude. The proposed ROW would be on the north side of the paved Amboy/Cadiz Road from the WSA. Construction noise impacts would last approximately 5 days (assuming 2 miles of construction per day over the 9-mile long corridor adjacent to the WSA). Pipeline construction noise would only incrementally increase noise levels already associated with road traffic.

Primitive Recreation. No effect is expected.

Special Natural Features. No effect is expected.

Availability and Need. The BLM has recommended over 2.1 million acres within the California Desert Conservation Area Plan jurisdiction as suitable for wilderness. WSA 304A was not recommended as suitable for wilderness in 1980 but until Congress acts it is still protected from major development (BLM 1980c).

Palen/McCoy WSA 325

Description. This immense area (266,531 acres) is bordered on the west by State Route 177; on the north by State Route 62 and the Colorado River Aqueduct; on the east by the Rice-Midland Road, the AT&SF Railroad, and a gas pipeline ROW; and on the south by Interstate 10 and a powerline and gas line ROW corridor. The area is over 90 percent public land. The Palen-McCoy area embraces a series of rugged, low-lying mountain ranges and broad valleys laced with ironwood washes. Four distinct mountain ranges form the core of the area. The Palen Mountains form a sizable mass of metasedimentary and metavolcanic rocks, with considerable evidence of striations. The McCoy Mountains appear as a ridgelike mass of metasedimentary rock, also displaying a somewhat stratified appearance. To the north of these ranges rise the Little Maria Mountains, a small, but complex range composed predominantly of limestone. The Granite Mountains, a steep mass of bouldery, granitic rock, rise to the north of the Palen range. The vegetative covering of these ranges is uniformly sparse, consisting of brittlebush and creosote bush scrub for the most part.

The proposed ROW crosses into the WSA along its eastern boundary near Brown's Well. It is about 150 feet west of the Brown's Well gravel road, which forms the WSA boundary line. If the ROW were located on the east side of the road it would be outside of the WSA. In the BLM Wilderness Study conducted in 1981, the area in the vicinity of the ROW was recommended as not suitable for wilderness.

Summarizing the findings of following sections, it has been estimated that the proposed ROW will not significantly impair wilderness opportunities in the WSA. However, the project does conflict with BLM Interim Management Policy for WSAs.

Integrity and Natural Appearance. Large areas laced with roads to active and abandoned mining operations, including tunnels, shafts, quarry pits, and surface scraping for ornamental rock, have been eliminated from further study. Such areas include the Arica Mountains, the south slope of the Little Maria Mountains, the southern McCoy Mountains area, the area east of the McCoy Mountains, the Arlington mine area, and the Palen Pass area. Other exclusions include: sites intensively used by Patton's tank corps, where large areas of desert pavement have been severely disturbed (especially between Palen Pass and the Arlington Mine Road); community developments and large tracts of non-public land around Desert Center; an area laced with roads constructed by Patton located north of the Granite Mountains; and a road to a quarry pit in Section 3 (T.2 S. R. 18E.), northeast of the Granite Mountains.

The remainder of the area generally appears to have been affected primarily by natural forces. Topograhic variation throughout and vegetative screening in the valleys serve to reduce the impact of internal man-made features. Therefore, man's works, which include a few primitive ways, some abandoned mines, and Patton's tank tracks on some desert pavement areas, are substantially unnoticeable. The interiors of the Palen and Granite Mountains are especially pristine.

The portion of this WSA crossed by the ROW is nearly flat plain with very sparse vegetation. As mentioned earlier, the route parallels the Browns Well Road. The Atchison and Topeka Railroad is about 2.5 miles east of the road. The traffic related to both of these corridors can be seen and heard from the proposed ROW. It is nearly impossible to control motor vehicle access off to the side of the Browns Well Road because of the flat terrain, so there are numerous tracks radiating from the corridor. The area would be difficult to manage as a non-motorized area with or without the project. The project will, therefore, directly disturb the WSA and its natural appearance to a limited degree but it will not significantly affect its integrity.

Solitude. There are outstanding opportunities for solitude in most segments of the WSA, however, along the proposed ROW there is little or no potential. This is due to the flat terrain and sparse vegetation. Construction of the pipeline will have short-term (7 days assuming 2.5 miles per day construction and ROW preparation) adverse effects on solitude in adjacent areas due to noise and visual intrusions.

Primitive Recreation. Some rockhounding, and camping has historically taken place in the WSA, but at very low levels. Much of the current use is associated with motor vehicles. The proposed ROW will not adversely affect primitive recreational opportunities.

Special Natual Features. No special or unique features are located along the proposed ROW.

Availability and Need. The large size and landscape of the WSA, outside that area disturbed by the ROW, provides numerous opportunities for wilderness recreation. In addition, the BLM has recommended over 2.1 million acres within the CDCA as suitable for wilderness.

Old Woman Mountains WSA 299

Description. This 134,400-acre WSA is located about 10 miles east of Cadiz and south of Essex in the California Desert. The WSA is characterized by a large, expansive creosote-covered bajada and by the massive, fault-lifted Old Woman Mountains. Numerous canyons and washes penetrate this rocky, rough mountain system. Wide varieties of vegetation are found in this area, including yucca, nolinas, barrel cactus, and juniper on the higher slopes. Steep spires and rock walls, as well as the Old Woman statue natural rock formation, dominate the north-central portion. The northwestern boundary of this roadless area parallels the Four Corners pipeline right of way and maintained road. The western boundary parallels a mining access road. To the south, the boundary consists of a railroad. The eastern boundary is a transmission line corridor and access road, and the northeastern boundary parallels a maintained road.

The WSA is adjacent to the Desert Plan Alternative ROW on the east and the proposed Cadiz pump station transmission line on the north. No project facilities or ROW cross the WSA.

Summarizing the findings of following sections, the proposed project and alternative would not significantly impair wilderness classification of the WSA.

Integrity and Natural Appearance. The majority of this roadless area is affected primarily by natural forces, with man's work substantially unnoticeable. The undeveloped land retains its primeval character and influence. The natural appearance of the WSA adjacent to the proposed facilities, however, has already been compromised because of the existance of the Four Corners Pipeline and road on the north and the Ward Valley transmission line corridor on the east. Traffic along these energy corridors is infrequent but it can be seen and heard from within the WSA. The proposed facilities will not adversely affect the natural appearance of the WSA because no disturbance within the WSA will occur and visual intrusions already exist.

Solitude. This large and diverse roadless area contains outstanding opportunities for solitude. The wide open spaces of the bajadas and interim valleys with views towards the Turtle Mountains, Stepladder Mountains, and Ship Mountains add to the feeling of spaciousness and unconfinement. The numerous narrow canyons, rocky and steep ridges and peaks, and stands of juniper all tend to screen visitors from sight of one another. The majority of this area allows freedom of movement.

In those portions of the WSA closest to the proposed facilities, there is very little opportunity to escape from sights and sounds of humans. This terrain is flat and existing transmission lines and roads can be seen for many miles. The project, therefore, will have no adverse affect on solitude, except during approximately 5 days when pipeline construction is taking place.

Primitive Recreation. Good quail, chukar, and deer hunting opportunities exist in this WSA. A portion of this WSA is designated as a Natural Environment Area. Limited hiking occurs in the area. The proposed project would not adversely affect primitive recreation opportunities.

Special Natural Features. No special features are located near proposed ROW's.

Availability and Need. The WSA has large tracks of wild land outside of the proposed corridors. In addition, the BLM has recommended 2.1 million acres of wilderness in the California Desert. It was recommended as not suitable for wilderness by the BLM.

Ship Mountains WSA 300

Description. The Ship Mountains WSA is located about three miles east of the Cadiz pump station. The WSA contains 23,850 acres and includes the central ridges of the Ship Mountains. It is bordered on the northwest by a gas pipeline ROW and road, on the southwest by a railroad line, and on the east by a mining access road from Danby to Chubbuck which serves as access to mines located on the western slopes of the Old Woman Mountains.

The proposed Cadiz pump station transmission line parallels the WSA's northern boundary along the Four Corners Pipeline ROW, but does not cross into the WSA.

Integrity and Natural Appearance. Topography of the WSA includes the long, sandy, gently sloping bajadas on the east and west of the Ship Mountains, as well as the mountains themselves. The mountains have many deep canyons, rises, flat-topped buttes, crags, and spires. The eastern side is particularly impressive. The northeast corner of the range shows evidence of block-tilted hills and some sand in the form of forerunners to dunes. The northern mountains have an upland valley proceeding south. Vegetation varies with the substrata and elevation. Some of the lower sandy areas support only a sparse growth of annual grasses, while the bajadas are dominated by creosote bush scrub. The slopes show little vegetation other than an occasional clump of brittle bush.

In the proposed ROW vicinity is the aforementioned pipeline access road, as well as other roads and transmission lines. Construction of the proposed transmission line would present another intrusion visible for many miles within the WSA. The project is expected to have only an incremental impact on the WSA's natural appearance and integrity.

Solitude. Outstanding opportunities for solitude exist in most of the WSA. The roughness of the mountainous terrain, as well as the size of the bajadas, serves to screen visitors from one another. The proposed transmission line will somewhat reduce opportunities for solitude in the vicinity of the ROW. This is not expected to significantly impair use of the WSA.

Primitive Recreation. There are no known recreation resources in the WSA. Only very limited use now occurs.

Special Natural Features. There are no special or unique natural features in the vicinity of the proposed ROW.

Availability and Needs. The BLM has recommended 2.1 million acres for wilderness in the CDCA. WSA 300 was recommended as not suitable for wilderness.

Coxcomb Mountains WSA 328

Description. The area has an unusual shape because it is adjacent to Joshua Tree National Monument. Other boundaries include State Route 62 to the north, the Colorado River Aqueduct to the east, a major utility line ROW to the southeast, and the Colorado River Aqueduct to the east. The area consists mostly of public land. Non-public land parcels are few and widely scattered, except along the Colorado River Aqueduct.

The area contains portions of two major mountain ranges with a "transition area" between. The Coxcomb Mountains rise sharply from the surrounding desert floor on the east end, with their jagged, granitic outline. The Pinto Mountains, on the west edge, have a more rounded form, although many of the slopes are steep. Large alluvial fans slope away from the mountains. Vegetation throughout the area is relatively sparse. Creosote and mixed shrubs dominate the bajadas and lower mountain slopes, becoming more sparse on the slopes. No unusual plant assemblages occur within WSA 328. Vegetation consists mostly of creosote bush scrub. No sensitive or significant plant species are known to occur within this WSA.

The varied terrain and presence of two springs in the eastern portion of the Coxcomb Mountains provides habitat for a variety of wildlife species. This includes the northeastern sector of the range used by the Coxcomb Mountains' bighorn sheep herd, estimated at 10 individuals and declining. Six square miles of bighorn sheep permanent range and 22 square miles of seasonal range for this herd are located in WSA 328. This includes 40 percent of the bighorn range in the Coxcomb Mountains. Eight square miles of former bighorn sheep range used by a population once present in the Pinto Mountains is also located here. This is about 7 percent of the Pinto Mountains' former bighorn range. Overall scenic quality is "high". The primary feature in the south is the Coxcomb Mountains which, as their name implies, consist of a series of steep, craggy granitic peaks which give the mountain a jagged appearance. Some color is displayed in the vegetation and surface tones. In the north, the foothills, remnants of the highly eroded Coxcomb Mountains are granitic boulder piles scattered on an alluvial plain. The rocks are rough-textured with tan and red-brown accents. The southern portion of the WSA (formerly WSA 328A) including the proposed ROW was recommended as not suitable for wilderness in the California Desert Conservation Area Final EIS (BLM 1980c), but no action has been taken.

The proposed Desert Plan Alternative parallels an existing electric transmission line as it passes through the very southeastern tip of the WSA. Although this area is roadless, it has been visually altered from natural condition by the transmission line. A tunnel for the Colorado River Aqueduct passes under the proposed ROW.

Summarizing the findings of the following sections it is estimated that the proposed Desert Alternative Route will impair wilderness characteristics of this WSA.

Integrity and Natural Appearance. Natural appearance of the WSA in the vicinity of the proposed ROW has been reduced by the presence of a major electrical transmission line. This line is highly visible to nearby reviewers. Construction of the line was done so that no access road was built and the area remains roadless.

The proposed route would be adjacent to the transmission line and would change the natural character of the ROW. Visual change would be an extension of existing industrial land use. ROW construction would have a significantly direct affect on the WSA natural integrity. If uncontrolled public motorized access were allowed on the ROW after pipeline completion then significant indirect adverse affects would also be experienced due to the proliferation of spur roads. The manageability of the immediate area would also be reduced.

Solitude. Throughout the portions of the area with wilderness characteristics, terrain variety and the relative absence of man's works create an environment containing outstanding opportunities for solitude. Particularly in the Coxcomb Mountains and in the boulder-pile area, steep rock canyon walls and the complex pattern of the low, granitic mounds isolate the individual from others and from the outside world and provide a sense of remoteness from civilization and immersion into pristine natural conditions.

The existing transmission line along the proposed route greatly detracts from the solitude of the immediate vicinity. This intrusion is visible from distant surrounding higher terrain, The proposed ROW would not significantly decrease opportunities for solitude.

Primitive Recreation. The Coxcomb Mountains have outstanding opportunities for primitive recreation. Existing recreation use, however, is limited. Principle activities are winter hiking, rock hounding and hunting. The proposed project would not significantly affect these activities.

Special Natural Features. The northern portion of the WSA contains outstanding scenic resources. There are no special or unique natural features in the ROW vicinity.

Availability and Need. The BLM has recommended large adjacent areas for wilderness. During the Study Phase of the Desert Plan comments were received on the WSA. In the Final Plan the northern portion of the WSA was recommended as suitable for wilderness, while the southeastern segment (formerly WSA 328A) was recommended as not suitable.

Arizona

Little Horn Mountains East WSA 2-127

Description. Unit 2-127 includes the eastern half of the Little Horn Mountains, a large portion of the Ranegras Plain to the north and a small portion of the Palomas Plain and Nottbusch Valley. Elevations vary from 1,150 ft on the Palomas Plain to 3,100 ft on the mesa tops in the south-central portion of the unit. The WSA contains 91,930 acres of BLM land.

The Little Horns are a highly dissected range of basalt and Kofa volcanics (andesite and rhyolite). The core of the range is a large basalt mesa cut by two 800-ft canyons with numerous small canyons cutting the periphery of the mesa. The cutting of the drainages has exposed the colorful Kofa volcanics whose reds, buffs, and yellows provide a striking contrast to the dark basalt. The range lacks a singular ridgeline but is a jumble of peaks, hills, and open canyons.

Vegetation on the desert pavement of the Ranegras Plain is Lower Sonoran-desertscrub, with creosote being the dominant species. On the foothills and mountains a paloverde-saguaro community dominates, featuring dense cholla stands on the mesa tops.

The proposed Celeron/All American pipeline route would be adjacent to, but not within the Little Horn Mountains East WSA. Alignment of the ROW would place it on the north side of the existing El Paso Natural Gas pipeline ROW, but within 200 ft of the WSA boundary. Therefore, impacts to the WSA would be limited to indirect effects, such as visual and noise intrusions from construction.

Integrity and Natural Appearance. Pipeline visual impacts would be subordinate to the existing visual intrusion from the 500-kV Palo Verde-Devers electric transmission line. There would be no direct disturbance to the WSA.

Solitude. Within Unit 2-127 an excellent opportunity for solitude exists. The jumbled arrangement of basalt mesas, hills, and low mountains separated by small canyons offer the hiker many secluded areas. Additionally, the vast size provides a feeling of isolation and separation from man's developments. The unit's locale, situated adjacent to three wilderness study areas (2-162A, 2-128, and 2-129) enhances this isolation.

Construction-related noise would reduce the solitude during the approximately 2 days of major activity in the area (assumes 2 miles per day over the 2.5-mile boundary segment). Equipment noise could potentially be above 55 dBA for distances up to 0.7 mile from the ROW (see the EIR/EIS Noise Section for more detailed information).

Noise from overflights of the route would not be a significant addition to the noise environment because similar activity for the El Paso pipeline already exists.

Primitive Recreation. The variety of topography found in the unit and its size combine to provide outstanding opportunities for primitive recreation. One could hike for extended periods without a sign of human imprints.

No significant effect is expected.

Availability and Need. There are 30 WSAs under consideration for wilderness within the BLM Phoenix District. It is adjacent to wilderness areas proposed in the Kofa NWR and other BLM WSAs (see Map D-2). The Phoenix District is now drafting an EIS on wilderness areas; records showing public support for inclusion are not available at this time.

Eagletail Mountains WSA 2-128

Description. The Eagletail Mountains-Cemetery Ridge study area (2-128) encompasses the Eagletail Mountains to the north, Cemetery Ridge to the south, and the desert plain between the two ridges. Elevations in the unit vary between a low of 1,200 ft on the desert plain immediately south of Cemetery Ridge to a high of 3,300 ft at Eagletail Peak. It contains 120,925 acres of BLM land.

Both ranges lie along a northwest to southeast line. The Eagletail topography is highly variable, ranging from a flat or gently undulating landform to one that is strikingly incised and dissected. The north slopes rise abruptly from the desert floor and elevational increases are spectacular.

Several different rock strata are visible in most places throughout the Eagletail Mountains. The combination of the parent material origin coupled with weathering and erosion has created spectacular landforms. Natural arches occur, as well as high spires, monoliths, and jagged sawtooth ridges that drop off almost vertically to the desert floor.

The vegetation of the unit is characteristic of the Sonoran Desert type. The lower slopes are dominated by creosote bush, white bursage, ocotillo, and teddy bear cholla. The more heavily vegetated washes are dominated by paloverde, ironwood, smoketree, catclaw, and a few mesquite trees. Vegetation on the steep hillsides include paloverde, barrel cactus, staghorn, hedgehog, Mormon tea, and saguaro cactus.

Common wildlife in the area includes jackrabbits, coyotes, ground squirrels, great horned owls, numerous raptors, and large coveys of quail. Desert bighorn sheep are also found within the unit.

The Celeron/All American proposed route lies adjacent to the Eagletail Mountains WSA for approximately 14 miles. Alignment of the ROW is located north and east of the El Paso pipeline and, therefore, would not cross into the WSA.

Potential impacts to this WSA would be the same as those described previously for the Little Horn Mountains WSA 2-127. WSA 2-128 is contiguous with 2-127.

Solitude. Outstanding opportunities for solitude exist within the Eagletail inventory unit. The dense vegetative cover of the bajadas and desert plains and the dramatic topographic relief of the mountains, coupled with the large size of the area, create ample and outstanding opportunities to avoid the sights and sounds of others within the area.

The most noticeable noise impacts from pipeline construction would last approximately 9 days (assuming a 2-mile per day construction rate plus ROW preparation time).

Primitive Recreation. The diversity of landforms found in the study unit again coupled with the size of the area create outstanding opportunities for primitive and unconfined recreation. Within the complex topography of the Eagletail Mountains numerous options for recreation exist, including hiking, photography, and rock climbing. The dramatic cliffs within the unit increase the challenge of the area and the chance of sighting a bighorn sheep spurs a user's interest. The vast size of the desert plain allows a recreationist to walk for hours without signs of human impacts.

North Maricopa Mountains WSA 2-157

Description. The North Maricopa Mountains inventory unit is located along the northern extent of the Maricopa Mountains, approximately 12 miles northeast of Gila Bend. It contains 75,485 acres.

The unit is bounded by a 230-kV powerline for half its western boundary, by a gas pipeline on its northern boundary, and roads from the remaining boundary, including the historical Butterfield Stage Route running along 6 miles of the unit's southeast portion.

The North Maricopa Mountains inventory unit contains a 10-mile long portion of the Maricopa Mountains as well as extensive portions of the surrounding desert plain. The higher mountains in this part of the Maricopa Range rise between 1,000 and 1,700 ft off the desert floor, with the highest peak in the unit being 2,813 ft in elevation. The mountains trend northwest to southeast. Their arrangement provides a high degree of topographic complexity.

Several wide valleys are interspersed with the mountains in the unit. In the northeastern portion a 3.5-mile valley separates a small mountain range from the rest of the unit. Valleys narrowing into canyons extend into the center of the area from all sides.

The western and southwestern portions of the unit include as much as 5 miles of desert plain radiating out from the mountains. This plain is dissected by countless washes, some of which are quite sizable and display a wide diversity of vegetation. The vegetation in the area is varied, but consists primarily of a palo verde-saguaro community with creosote, mesquite, and some dense stands of cholla. Ironwood is common in the drainages.

Among other species, this area provides habitat for coyotes, bobcat, fox, deer, many jackrabbits, and perhaps cougar. Raptors are numerous, as are Gambel's quail.

Celeron/All American's proposed ROW lies adjacent to approximately 10 miles of the northeastern boundary of the North Maricopa Mountains WSA. Routing of the pipeline would locate it on the northern side of the existing El Paso pipeline ROW outside of the WSA, but usually within 250 ft of its boundary. Potential impacts to the WSA, therefore, would be limited to indirect effects such as visual change and noise from construction.

Impacts from pipeline construction would be similar to those described for WSA 2-127.

Solitude. Outstanding opportunities for solitude are present throughout much of the North Maricopa Mountains inventory unit. Approximately two-thirds of this unit is comprised of the Maricopa Mountains themselves. The mountains present a complex topography of peaks, hills, canyons, valleys, and washes. The mountains are not so rugged as to concentrate use, yet they present the sense of wildness and challenge usually associated with a mountainous area.

The most noticeable noise effects from pipeline construction would last approximately one week (assuming a 2-mile per day construction rate plus ROW preparation time).

Primitive Recreation. The size of the unit, 10 by 12 miles, allows for extended camping and hiking trips as well as day use. The complexity of the topography in this area creates many "hidden" and isolated places that invite exploration. The diversity of topography insures that primitive recreation opportunities are available for many users or user parties without a loss of sense of unconfinement.

New Water Mountains WSA 2-125

The New Water Mountains Inventory Unit 2-125 is located in central La Paz County approximately 10 miles east of Quartzsite, Arizona. It is accessible via Gold Nugget Road and Vicksburg Road south from Interstate Highway 10, or Ramsey Mine Road south from US Highway 60. The inventory unit is comprised of 40,375 acres of BLM-administered public land.

The initial inventory unit boundary was derived from a study conducted by the FWS of the wilderness resources both within the Kofa Game Range and portions of adjacent public lands. Upon completion of the study, the FWS proposed that 542,600 acres in 4 units be included in the National Wilderness Preservation System as the Kofa Wilderness. The Plumosa Mountains Unit, northernmost of the four, lies mostly within the bounds of BLM-administered land. Although an application for withdrawal of lands encompassing the Plumosa Mountains Unit was initiated by the FWS, it had not been acted upon by the time of the BLM's wilderness inventory. Therefore, it was necessary for the BLM to initiate its own study of the same area.

Most of this unit is comprised of rugged volcanic mountains dissected by many narrow canyons and sandy washes. The remainder is a large creosote plain cut by numerous swales, throughout which occur swaths of desert pavement. Such diverse topography adds to the character of the roadless area.

The Ranegras Plain, which lies in the northeast corner of the unit, constitutes about 18,500 acres of the inventory area. This wide plain rises slowly to the desert bajada at the base of the steep-faced New Water Mountains.

The New Water Mountains are a colorful range of mountains with steep craggy spires. Within this diverse mountain group occur large rock outcrops, steep slick rock canyons, and deep sandy washes that dissect these mountain slopes.

The western portion of this unit is comprised of a small portion of the Plumosa Mountains. Here a large volcanic butte called Black Mesa dominates the landscape. The mesa's slope, covered with black basalt boulders, is dotted with green saltbush, thereby adding bright contrasting colors to the area.

Biologically, this unit is of the lower Sonoran Desert life zone. With only 5 inches of rainfall during the year the vegetation is sparse. The plant life consists primarily of a creosote bursage association, interspersed with palo verde and ironwood along the many washes. As one approaches the mountains, vegetation lessens, a few saguaro cactus may be seen, and in many places the teddy bear cholla is thick. Very little vegetation grows on the desert pavement that is commonly found between the washes.

Desert bighorn sheep, mule deer, and feral burros are a few of the many species of wildlife that inhabit the New Water Mountains. These animals travel at will from their domain in the Kofa NWR. The area provides habitat for these and many other animals including mountain lion and javelina.

The Brenda Alternative would not cross the New Water Mountains WSA.

Integrity and Appearance. The proposed ROW cuts across the WSA's northern segment, an area of creosote plains cut by sandy washes about 5 miles from a volcanic butte called Black Mesa. There currently are no major visual intrusions in the area other than distant I-10 and one vehicle way. BLM plans show most of the corridor having a VRM rating of Class I, pristine conditions.

After construction of the pipeline, visual conditions in the corridor would be VRM Class IV, a landscape where man-induced changes may be dominant. These intrusions would be visible to observers in the WSA's higher terrain to the south.

Integrity of the WSA would be moderately compromised by the pipeline because it would affect the upper northern 15 percent of the 40,375-acre WSA. The area's central portion would remain untouched and project-related scenic changes would not be visible from it.

Solitude. The New Water Mountains Inventory Unit offers the user an outstanding opportunity for solitude. From the intricate web of canyons winding among the craggy spires in the Twin Peaks and Gunsight Notch area, and the numerous ravines slicing into the earth around Black Mesa, to the broader valleys in between that display their own complex arrangement of hills and washes, there is no difficulty avoiding the sights and sounds of other people in the unit. The character of the area is such that it could accommodate numerous users before the opportunities for solitude would be compromised.

Pipeline construction would have significant short and long-term impacts on opportunity for solitude in the WSA's northern plains and foothills. Equipment noise would be very noticeable during the approximately 5 days of construction in the WSA (assumes a 2-mile per day construction rate plus ROW preparation time). Noise levels of 55 dBA would be audible up to 0.7 mile from the ROW.

Primitive Recreation. The New Water Mountains inventory unit of 40,375 acres allows for extended backpacking trips as well as an ideal place for day hikes. The unit is bounded on the south by the Kofa NWR

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which has proposed an additional 530,000 acres for inclusion in the National Wilderness Preservation System. The two areas combined would allow for a variety of lengthy backpacking trips and would absorb several user groups at a time.

The New Water Mountains are a highly scenic area offering very colorful mountains with steep, slick-walled canyons and sharp prominent ridges offering striking views of the rugged Kofa Mountains. This area when coupled with the dominant Black Mesa provides an outstanding opportunity to view and photograph these scenic wonders.

The New Water Mountains inventory unit being adjacent to the Kofa NWR affords many opportunities to view, photograph, and hunt the majestic desert bighorn sheep. Such opportunities are truly outstanding since both the New Water Mountains and the Plomosa Mountains are historically lambing areas for the desert bighorn.

Rockhounding in this area is outstanding due to the many historical mining claims. The Arizona Department of Natural Resources has established this area and surrounding country as the "Crystal Mountain Area." It is set aside as an "outstanding rock collecting" area. Here abandoned mines and the mineralized mountains provide the user with areas to dig for jasper, quartz, and chrysocolla.

There currently are numerous roads in this area. Following construction, ORV use of the pipeline ROW is expected to occur. Such activity could further deteriorate wilderness characteristics of the area and is inconsistent with current BLM management policy.

Special Natural Features. No unique natural features are within the ROW corridor.

Availability and Need. Opportunities for primitive recreation in a wilderness setting adjacent to the WSA have been previously described in the Little Horn Mountains analysis. Public support for designation of the WSA as wilderness has not been quantified.

APPENDIX E

VISUAL RESOURCES

APPENDIX E

VISUAL RESOURCES ANALYSIS ON LOS PADRES NATIONAL FOREST

INTRODUCTION

Impacts of pipeline construction and operation on visual resources are of particular concern in the Las Padres National Forest (LPNF). The following analysis of the differences in impacts among the routing alternatives is limited to the segments of the alternatives on LPNF. The following are definitions of the visual classifications used in this discussion:

- Variety Class - A particular level of visual variety or diversity of landscape character.
  - A = Distinctive
  - B = Common
  - C = Minimal.
- Sensitivity Level - A particular degree or measure of viewer interest in the scenic qualities of the landscape.
  - 1 = Highest concern
  - 2 = Average concern
  - 3 = Lowest concern or seldom seen.
- Viewing Distance - Areas of landscapes denoted by specified distances from the observer. Used as a form of reference in which to discuss landscape characteristics or activities.
  - Fg = Foreground, 0 to 0.5 mile
  - Mg = Middleground, 0.25 to 5 miles
  - Bg = Background, 3 or more miles.
- Visual Quality Objective (FS VQO) - A desired level of excellence based on physical and sociological characteristics of an area. Refers to acceptable alteration of the landscape (see Table 3-28).
- Visual Absorption Capability (VAC) - The ability of a landscape to absorb a human activity or facility without significantly altering the natural appearance.
  - H = High
  - M = Moderate
  - L = Low.
- Existing Visual Condition (EVC) - The current state of naturalness or alteration that exists at a particular site or landscape area (see Table 3-28).
- Future Visual Condition (FVC) A prediction of the expected future state of the landscape as it would appear after the Celeron/All American or Getty proposals were implemented (see Table 3-28).

CELERON PROPOSAL

Affected Environment

The Celeron route in La Brea Canyon would affect a total of 184 acres of land within the LPNF. Landscape variety is common (variety Class B) and typical of the Coastal Mountain Ranges within 74 percent of the corridor. The remainder of the corridor contains landscape variety that is minimal (variety Class C). Ninety-three percent of the corridor is visible from the La Brea Canyon Road and other travelways that contain significant numbers of aesthetically concerned viewers and is classified as high in sensitivity (sensitivity level 1). Approximately 85 percent of this route is viewed from critical viewing distance zones (foreground and middleground).

Approximately 19 percent of this corridor is presently untouched by human activities. Human activities remain subordinate to the natural landscape on 24 percent of the corridor (EVC Classes II & III) and dominate the natural landscape on the remaining 59 percent (EVC Classes IV and V).

The relative ability of the landscape to absorb pipeline development without loss of its natural character is low on approximately 86 percent of this route.

Under current Forest management direction, approximately 89 percent of the corridor is managed, as a minimum, to meet the Retention and Partial Retention visual quality objectives (VQOs). The remainder of the corridor is managed to meet the modification and maximum modification VQOs. Presently, these objectives are met on only 33 percent of the corridor due primarily to the impacts associated with the La Brea Canyon Road and fuel break construction.

Environmental Consequences

Development of the pipeline under the Celeron proposal would result in visual disturbances that would appear dominant over the natural landscape (visual condition Classes IV and V) on approximately 89 percent of the corridor. Pipeline activities would remain visually subordinate to the natural landscape on the remainder of the corridor.

Existing visual conditions would decline on approximately 40 percent of the corridor. Pipeline activities would not be consistent with LPNF visual quality objectives on approximately 89 percent of the corridor (a significant impact). Present VQO achievement levels would decline by 72 percent under this alternative.

GETTY PROPOSAL

Affected Environment

The Getty route in La Brea Canyon would affect a total of 184 acres of land within the LPNF. Landscape variety is common or typical of that found within the coastal mountains of southern California on 73 percent of the corridor. The remainder of the corridor contains minimal landscape variety. Ninety-six percent of the corridor is visible from the La Brea Canyon Road and other travelways that are classified as high in sensitivity to the viewing public. Approximately 92 percent of the corridor is viewed from critical viewing distance zones (Fg & Mg).

Virtually the entire corridor has been disturbed by human activities. These disturbances remain visually subordinate to the natural landscape (EVC Classes II and III) on 30 percent of the corridor and are visually dominant on the remainder.

The relative ability of the landscape to absorb pipeline development activities without loss of natural character is low on 60 percent of the corridor, moderate on 38 percent, and high on 2 percent.

Under current Forest management direction, approximately 92 percent of the corridor is managed to meet, as a minumum, the Retention and Partial Retention VQOs. The remainder of the corridor is managed to meet the Modification and Maximum Modification VQOs. Presently these VQOs are met on approximately 13 percent of the corridor due to impacts associated with the La Brea Canyon Road and fuel break construction activities.

Environmental Consequences

Development of the pipeline under the Getty proposal would result in visual disturbances that would dominate the natural landscape (visual condition Classes IV and V) on 86 percent of the corridor. Pipeline activities would remain visually subordinate to the natural landscape on the remainder of the corridor.

Existing visual conditions would decline on approximately 30 percent of the corridor. Pipeline activities would not be consistent with the Forest's inventoried visual quality objectives on approximately 92 percent of the corridor (a significant impact). Present VQO achievement levels would decline by approximately 62 percent.

SANTA MARIA CANYON ALTERNATIVE

Affected Environment

The Santa Maria Canyon Alternative would affect approximately 53 acres of land within the LPNF. Landscape variety is unique or distinctive (variety Class A) on approximately 6 percent of the corridor. Landscape variety is common or typical of that found within the coastal mountains of southern California on the remainder of the corridor. Approximately 67 percent of the corridor is visible from State Highway 166 at critical viewing distance zones. The remainder of the corridor is seldom seen by the public.

Approximately 56 percent of the corridor is untouched by human activities. On the remainder of the corridor, disturbances from human activities remain visually subordinate to the natural landscape on approximately 34 percent of the corridor and are visually dominant on the remaining 10 percent.

The relative ability of the landscape to absorb pipeline activities without loss of natural character (VAC) is low on approximately 71 percent of the corridor, moderate on 22 percent, and high on the remaining 7 percent.

Under current Forest management direction, approximately 67 percent of the corridor is managed, as a minimum, to meet the Retention and Partial Retention VQOs. The remainder of the corridor is managed to meet the modification VQO. Presently these objectives are met on approximately 85 percent of the corridor. Underachievement of VQOs on the remainder of the corridor is due to impacts associated with Highway 166.

Environmental Consequences

Development of the pipeline under the Santa Maria Canyon Alternative would result in visual disturbances that would appear dominant over the natural landscape on approximately 35 percent of the corridor. Pipeline activities on the remainder of the corridor would remain visually subordinate to the natural landscape.

Existing visual conditions would decline on approximately 30 percent of the corridor. Pipeline activities would not be consistent with LPNF visual quality objectives on approximately 45 percent of the corridor (a significant impact). This under achievement would occur mostly within those portions of the corridor that are highly visible from Highway 166. Presnet VQO achievement levels would decline by 65 percent under this alternative.

COMPARISON AND EVALUATION OF ALTERNATIVES

The table below summarizes some of the differences among the routing alternatives.

	Celeron Proposal	Getty Proposal	Santa Maria Canyon Alternative
Future Visual Conditions			
Condition Class I	0	0	0
Condition Class II	5 percent	4 percent	39 percent
Condition Class III	6 percent	4 percent	16 percent
Condition Class IV	34 percent	35 percent	19 percent
Condition Class V	55 percent	57 percent	26 percent
Condition Class VI	0	0	0
Decline in Existing Visual Conditions	40 percent	30 percent	30 percent
VQO Achievement Levels	11 percent	8 percent	55 percent
Visual Quality Index	27.02	29.38	46.72

The visual quality index provides a measure of the overall visual quality that would result under each alternative. The index is a product of variety classes and future visual conditions. Highest possible visual quality (all acres = Variety Class A and Visual Condition Class I) would be indicated by an index of 100. The lowest possible visual quality would be indicated by an index of zero (all acres = variety Class C and visual condition Class VI). According to the calculations, the Santa Maria Canyon Alternative would produce the highest overall visual quality among the alternatives, and the Celeron proposal would produce the lowest.

Existing visual conditions are significantly lower along the Celeron and Getty proposals; however, the pipeline development would offer little potential for enhancement or rehabilitation of visual resources in these corridors due to the large scale of the pipeline development proposals. The highly scenic, small scale character of La Brea Canyon, in particular, would undergo major changes in its existing natural character.

The Santa Maria Canyon alternative would have significantly higher future visual conditions and VQO achievement levels, would affect fewer acres of National Forest land, and would offer greater potential for concealing the pipeline development from public view than either the Celeron or Getty proposals.

APPENDIX F

NOISE DATA SUMMARY

TABLE F-1

PUMP/HEATER STATION NOISE IMPACT MODELING RESULTS[1]

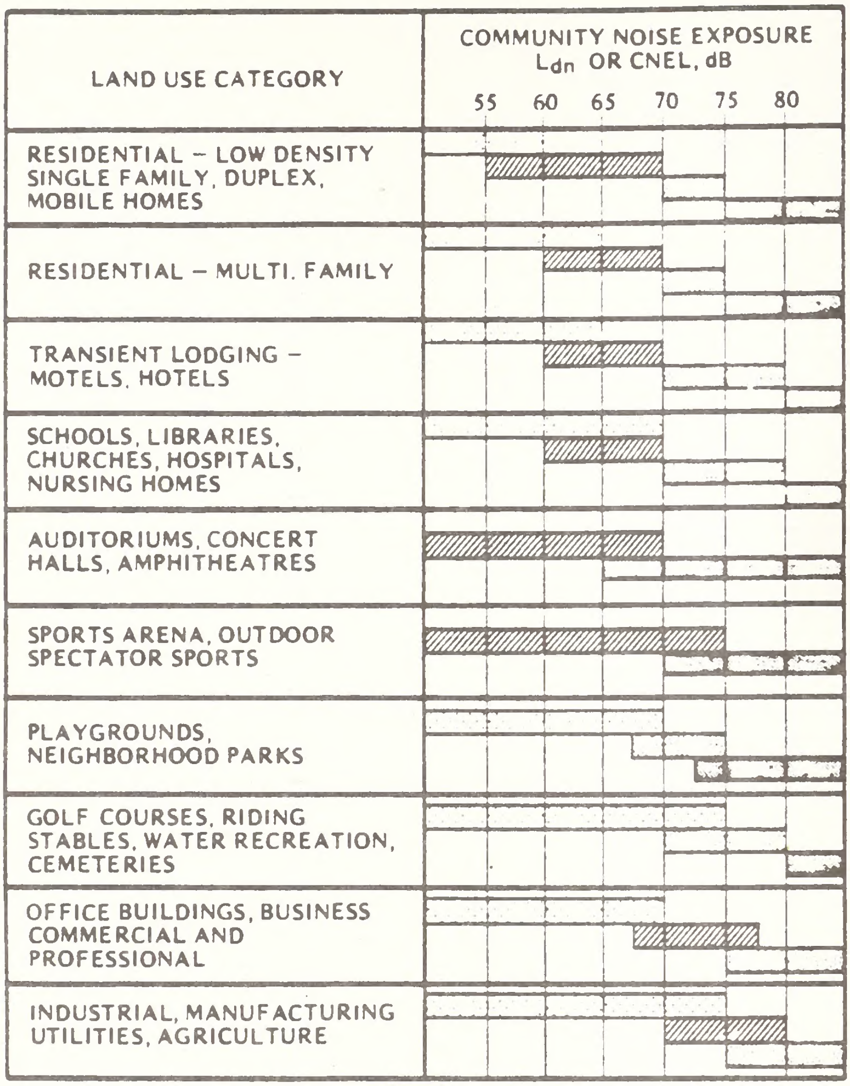
Case	Condition Modeled	Distance from Facility Center (in feet) to Noise Level Contour 70 dBA	60 dBA	50 dBA	40 dBA	30 dBA
1	(3) 2,500-hp electric motor driven pumps	550	1,300	2,600	4,700	7,500
2	(2) 3,500-hp gas-turbine driven pumps	NA[2]	200	600	1,650	4,000
3	(2) 30 mmB/hr heaters	NA	280	800	2,100	4,800
4	Case 2 plus one heater	NA	280	800	2,200	5,000
5	Case 1 plus case 3	550	1,300	2,600	4,800	8,000
6	(3) 5,000-hp electric moter driven pumps	720	1,550	3,000	5,500	8,800

Source: ERT

[1]Model employed: ERTNOI, ERT's proprietary multiple point source noise propagation model.

[2]Not Available

Modeling Assumptions:
Flat terrain, no barrier effects.
No equipment directivity effects.
Electric motor-driven pump combinations use high efficienty motors; drive speed less than 1,600 rpm; no enclosures.
Heaters are natural draft, unsilenced units.
Gas turbine driven pump units have inlet silencers only; with heat recovery system; NEMA D specification assumed.
Atmospheric conditions are based upon a "standard day" of 15 degrees C (59 degrees F) with 70 percent relative humidity; results represent long term average values. Daily and hourly differences will exist due to wind and temperature gradients which can result in increases or decreases in noise levels.



INTERPRETATION

NORMALLY ACCEPTABLE

Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

CONDITIONALLY ACCEPTABLE

New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

NORMALLY UNACCEPTABLE

New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

CLEARLY UNACCEPTABLE

New construction or development should generally not be undertaken.

CONSIDERATIONS IN DETERMINATION OF NOISE–COMPATIBLE LAND USE

A. NORMALIZED NOISE EXPOSURE INFORMATION DESIRED

Where sufficient data exists, evaluate land use suitability with respect to a "normalized" value of CNEL or L_{dn}. Normalized values are obtained by adding or subtracting the constants described in Table 1 to the measured or calculated value of CNEL or L_{dn}.

B. NOISE SOURCE CHARACTERISTICS

The land use-noise compatibility recommendations should be viewed in relation to the specific source of the noise. For example, aircraft and railroad noise is normally made up of higher single noise events than auto traffic but occurs less frequently. Therefore, different sources yielding the same composite noise exposure do not necessarily create the same noise environment. The State Aeronautics Act uses 65 dB CNEL as the criterion which airports must eventually meet to protect existing residential communities from unacceptable exposure to aircraft noise. In order to facilitate the purposes of the Act, one of which is to encourage land uses compatible with the 65 dB CNEL criterion wherever possible, and in order to facilitate the ability of airports to comply with the Act, residential uses located in Community Noise Exposure Areas greater than 65 dB should be discouraged and considered located within normally unacceptable areas.

C. SUITABLE INTERIOR ENVIRONMENTS

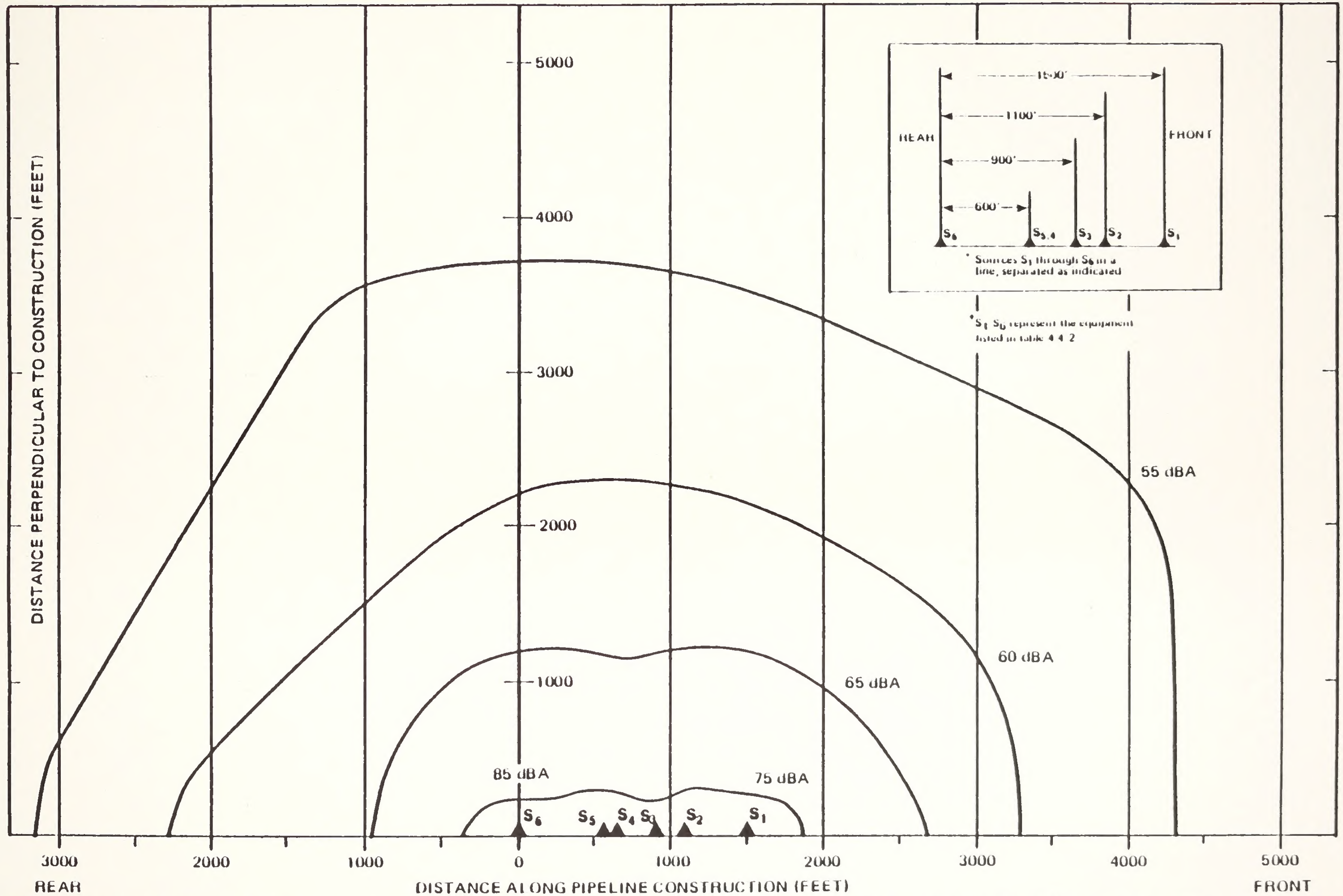
One objective of locating residential units relative to a known noise source is to maintain a suitable interior noise environment at no greater than 45 dB CNEL or L_{dn}. This requirement, coupled with the measured or calculated noise reduction performance of the type of structure under consideration, should govern the minimum acceptable distance to a noise source.

D. ACCEPTABLE OUTDOOR ENVIRONMENTS

Another consideration, which in some communities is an overriding factor, is the desire for an acceptable outdoor noise environment. When this is the case, more restrictive standards for land use compatibility, typically below the maximum considered "normally acceptable" for that land use category, may be appropriate.

FIGURE F-1 CALIFORNIA OFFICE OF NOISE CONTROL LAND USE COMPATABILITY FOR COMMUNITY NOISE ENVIRONMENTS

Source: Santa Barbara County, 1979



SOURCE: Modified from BLM Final Environmental Impact Statement, Crude Oil Trasportation System: Valdez, Alaska to Midland Texas, Chapter 8

FIGURE F-2 NOISE LEVELS FROM SUBURBAN PIPELINE CONSTRUCTION SCENARIO

Source: Getty, 1983

APPENDIX G

ECONOMIC SUPPLY AND DEMAND

APPENDIX G

ECONOMIC SUPPLY AND DEMAND FOR THE CELERON/ALL AMERICAN AND GETTY PIPELINE PROJECTS

Introduction

When supply is greater than demand, a surplus exists. Such a condition exists in Petroleum Administration for Defense District V (PADD V) in terms of crude oil. The crude oil surplus in PADD V is expected to increase from its present level of 800 thousand barrels per day (BPD) to an estimated 1.0 to 1.3 million BPD by 1990. The additional crude oil supply is largely attributed to the new discoveries in the western Santa Barbara Channel and the Santa Maria Basin of the Outer Continental Shelf (OCS). The crude oil surplus is further aggravated by the inferior quality of the new OCS crude. In comparison to most crude being refined on the West Coast, the OCS crude is heavier and has a significantly higher level of sulfur and metals. These properties have a negative economic impact on the ability of petroleum refiners to process OCS crude oil. Simply stated, there is too much low quality crude on the West Coast for the next twenty years.

In addition to a PADD V oversupply problem, there is also a local problem in the western Santa Barbara Channel and Santa Maria Basin production areas. Most of the new OCS crude production will be brought onshore in the Gaviota coastal area. However, there are presently no crude oil pipelines in the immediate area and the oil must move by tanker or barge for refining. The existing marine terminals in the OCS production area are too small to handle the projected OCS production volume. As the production in the OCS area increases, new crude oil transportation systems will be required. In response to the need for additional crude oil transportation systems, Getty, Celeron, and All American Pipeline have proposed their respective pipeline projects.

The respective purposes of the Getty and Celeron projects are:

- To provide an economically competitive and environmentally compatible ground-based crude oil transportation system from the Western Santa Barbara Channel and Santa Maria Basin oil production areas to the San Joaquin Valley of California. The new system should provide a connection to the existing and planned California crude oil transportation systems.

The purpose of the All-American Pipeline project is:

- To provide an economically competitive and environmentally compatible ground-based crude oil transportation system from the existing and planned San Joaquin Valley and the Four Corners Pipeline Company's Line 90 in Eastern California to the existing crude oil transportation systems in the Midland area of West Texas.

In order to evaluate the need for the proposed pipeline projects, an understanding of the supply and demand for crude oil is appropriate. Numerous detailed studies have been made on this topic in the past ten years, after it became evident that a PADD V crude oil surplus was going to develop. The purpose of this analysis is to summarize and supplement much of the past work and enable the public and agency decision makers to have a better understanding of the proposed projects and their effect on the PADD V crude oil surplus.

General Considerations

Petroleum Administration for Defense Districts (PADDs). Supply and demand for crude oil and petroleum products is assessed on a regional basis. For statistical purpose, the United States has been divided up into five PADDs. The five westernmost continental States (Washington, Oregon, Nevada, California, and Arizona), Hawaii, and Alaska make up PADD V. Within PADD V, there exists an extensive crude oil and refined products pipeline and water transportation system. Therefore, supply and demand imbalances in one area of the district can be quickly corrected by the existing transportation network. PADD V is unique from the rest of the United States because of its geographic isolation. PADD V's major refining centers are located in the Puget Sound area, San Francisco Bay area and Los Angeles.

PADDs I-IV make up the balance of the U.S. There is an intricate transportation system which allows extensive movement of crude oil and petroleum products throughout PADDs I-IV. The dominant refining area in PADDs I-IV is PADD III, the Gulf Coast. The nation's largest refineries are located in PADD III; these dominate the crude oil and petroleum product movement in PADDs I-IV. Due to dominance of PADD III over PADDs I-IV, this analysis will focus on PADD III as being representative of PADDs I-IV.

Crude Oil Quality. Crude oil is a mixture of hydrocarbons that ranges from single-carbon compounds to large complex molecules. Each crude oil is unique and its quality can vary from field to field and even from well to well in a single field. There are numerous methods to characterize the quality of crude oil. In reference to the proposed projects, API gravity, sulfur content, metals content, and viscosity are the four most important characteristics of crude oil.

API gravity is a measure of the specific gravity of oil, the higher the number, the lighter the oil. For example, an API gravity of 40 indicates a very light oil, and a gravity of 10 is indicative of a very heavy oil. A gravity of 10 is equivalent to the density of water. Almost all oils are lighter than water. API gravity is a general measure of a particular crude oil's yield of gasoline, jet fuel, and diesel. A high gravity crude produces more gasoline, jet fuel and diesel, than a low gravity crude. Sulfur content measures the sulfur removal required to produce saleable products. Sulfur is expensive to remove from petroleum products. Metals content is an important characteristic because it poisons the catalysts used in refineries and adversely affects product yields. Viscosity provides a measure of crude oil resistance to flow. High viscosity crude oil normally has to be heated to be pipelined. Table G-1 provides a comparison of OCS crude qualities to those of typical crudes run in PADD V.

TABLE G-1

COMPARISON OF PADD V CRUDE OIL QUALITIES

	California OCS (Hondo)	Alaskan North Slope	Indonesian Minas	Average California Crude Slate
PROPERTY				
Gravity, °API	17.4	26.3	35.3	25.2
Sulfur, Wt%	4.9	1.0	0.1	1.0
Metals, ppm (1,000°F+ fraction)	718	103	57	NA[1]
Viscosity (Centistokes @ 100°F)	446	16	19	NA[1]

Source: ADL 1984, Purvin and Gertz, Inc. 1983, and Robert Brown Associates

[1]Not Available

PADD V Historic Perspective

Before the start-up of the trans-Alaskan pipeline in 1977, PADD V was in a crude short position and imported large quantities of foreign crudes mainly from Indonesia, Malaysia and the Middle East. About 500 thousand BPD of the light, low sulfur Indonesian crudes were being imported in the late 1970s into PADD V to supply substantial quantities of low sulfur fuel oil (less than 0.5 percent sulfur) for California utilities. In general, the higher sulfur California and Alaska crudes cannot meet the stringent fuel oil sulfur requirements established by California's air quality regulations. The large volume of Middle East crude, which was being imported during the period, was generally high in sulfur but quite light. The shift to Alaskan North Slope crude on the West Coast had a favorable effect on sulfur content but was less desirable in terms of light product yield.

In mid-1979, approximately 2.3 million BPD of crude oil was produced in PADD V. Of this total, about 1.3 million BPD was produced in Alaska, with the balance produced in California. About 400 thousand BPD of the Alaskan North Slope crude was shipped to other areas of the United States, mainly the Gulf Coast. About 500 thousand BPD of low sulfur foreign crude was imported during this period primarily for the production of low sulfur fuel oil for utilities.

Demand for petroleum products in PADD V has decreased significantly since 1979 due to conservation, the decline in economic activity and the switch by electric utilities from fuel oil to cheaper and environmental cleaner natural gas. PADD V crude oil runs have also decreased from a level of about 2.4 million BPD in 1979 to about 2.0 million BPD in 1982. Movements of Alaskan crude from PADD V to PADDs I-IV have increased from about 400 thousand BPD in 1979 to almost 800 thousand BPD in 1982.

Future Prospects for PADD V

Many variables affect the size and duration of PADD V's crude oil surplus. These variables include the size of the new OCS discoveries, the quality of the OCS oil, how long and at what rate the new OCS discoveries produce oil, the volume of oil produced from Alaska and the desire and ability of PADD V refiners to retrofit existing refineries to accept OCS oil. Each of the above listed variables has a certain amount of uncertainty associated with it. The projections contained in this report are the best available at the current time, but will surely be revised as future events unfold.

The PADD V crude oil supply is expected to increase from about 2.8 million BPD in 1982 to about 3.2 million BPD in 1990. Alaskan production is projected to contribute about 1.8 million BPD to the 1990 period total. The OCS crude production is anticipated to increase from about 76 thousand BPD to about 500-600 thousand BPD between 1982 and 1990 (Table G-2). The demand for crude oil in PADD V is expected to remain relatively flat at about 2 million BPD from 1982 to the turn of the century. The crude oil surplus in PADD V is estimated to increase from about 745 thousand BPD in 1982 to about 1.1 to 1.3 million BPD in 1990 (Table G-2). The West Coast surplus is expected to decrease to less than 500 thousand BPD by the year 2000. The West Coast crude oil surplus is graphically illustrated in Figure G-1.

West Coast refineries can accommodate limited quantities of OCS crude before refinery retrofits are required. This is due to the low gravity and high sulfur and metals content of the OCS crude which is incompatible with existing refinery processing equipment. The ability of OCS crude to be processed on the West Coast has been assessed at two investment levels. The first level is with no retrofits and the second level is with major retrofits. Table G-3 provides geographic distribution of the potential of OCS crude production that could be refined on the West Coast at these two levels of investment. The capital cost of the major retrofits has been estimated to be about $920 million. Operating costs, excluding capital charges, would increase by about $330 million per year with the major retrofits (ADL 1984).

TABLE G-2

WEST COAST CRUDE OIL SUPPLY AND DEMAND

(In Thousands of BPD)

	1982	1985		1990		1995		2000	
		P&G[1]	ADL[2]	P&G	ADL	P&G	ADL	P&G	ADL
SUPPLY									
California									
OCS[3]	76	121	160	421	594	556	411	439	221
Other	899	886	876	821	865	728	839	634	809
Alaska	1,698	1,800	1,790	1,860	1,730	1,600	1,290	1,600	1,130
Imports	92	50	100	50	50	50	100	50	100
Total Supply	2,765	2,857	2,926	3,152	3,239	2,934	2,640	2,723	2,260
DEMAND									
PADD V Crude Oil	2,020	2,070	1,985	2,090	1,935	2,170	1,955	2,250	1,975
Surplus	745	787	941	1,062	1,304	764	685	473	285

[1]Purvin and Gertz, Inc. 1983

[2]ADL 1984

[3]Includes Carpinteria, Dos Cuadras, Santa Clara, Beta, Hueneme, and Santa Ynez

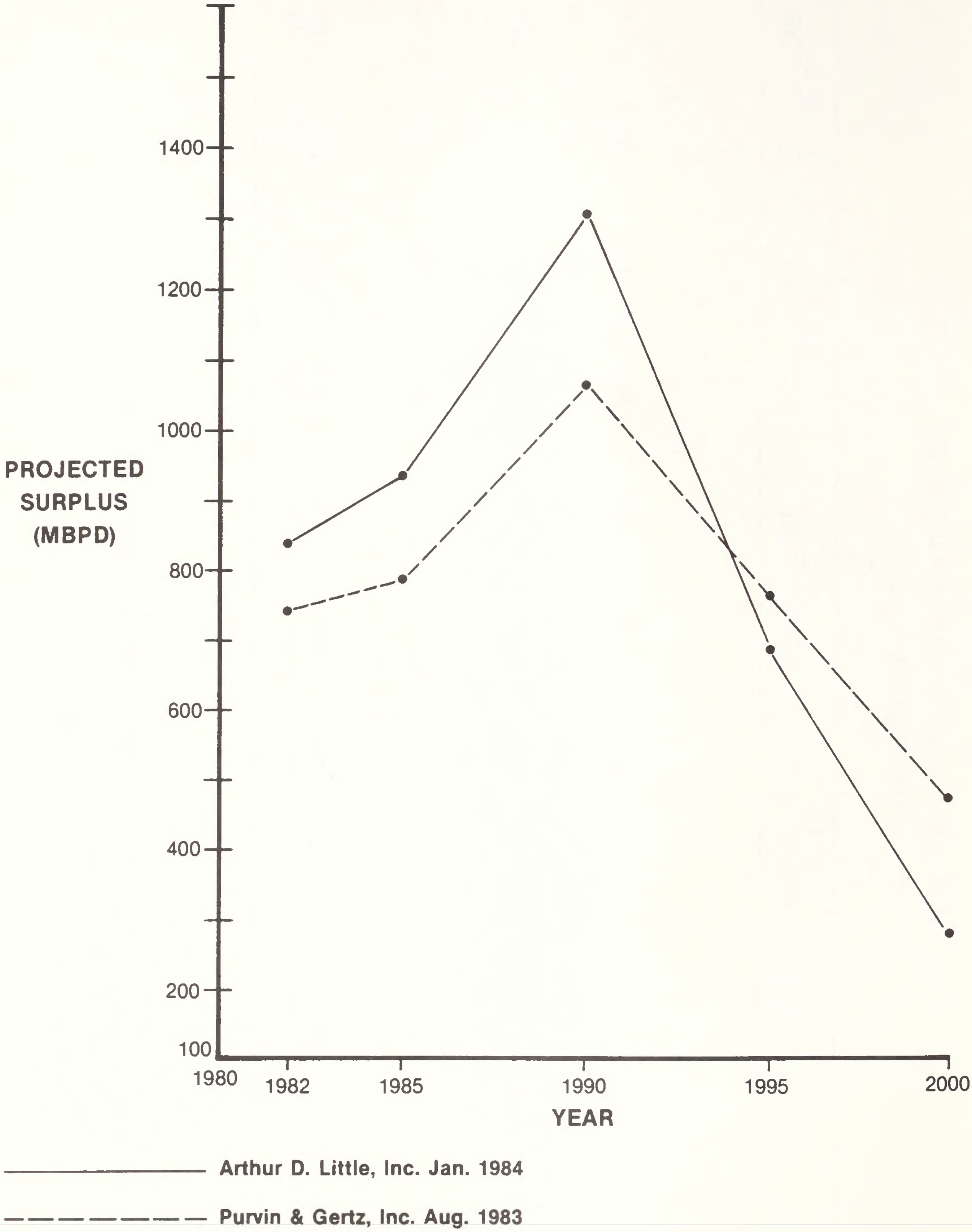


FIGURE G-1 PADD V CRUDE OIL SURPLUS FORECAST

TABLE G-3

POTENTIAL ABILITY OF WEST COAST REFINERS TO REFINE OCS CRUDE (Thousand BPD)

	No Retrofits	Major Retrofits
Puget Sound	0	0
Northern California	35	50
Southern California	45-80	200-230
TOTAL	80-115	250-280

Source: ADL 1984, Purvin and Gertz, Inc. 1983, and Robert Brown Associates.

PADD III Historic Perspective

PADD III has been a crude deficient area since the 1950s. Historically it has processed a mixture of light crudes from local and foreign sources. The PADD III average crude oil slate has been about 10 degrees lighter than the PADD V slate. The average sulfur content of the crude processed has been about the same as PADD V (ADL 1984). However, while the average sulfur content is about the same as the West Coast, many refineries could process only low sulfur crude of less than 0.5 percent sulfur, while others could accommodate a wide range of crudes.

The increased availability of heavier, higher sulfur and lower priced crude oils has created a need for major restructuring of PADD III refineries. An excess of $5 billion has been invested on capital projects in PADD III to allow the refineries to process lower priced crudes. An additional $1 billion of capital investment for PADD III refineries has already been announced.

Some of the new projects are capable of accommodating crude with characteristics similar to the OCS crude. However, other new projects would be able to accommodate only limited quantities of OCS crude. For example, Chevron's $1.2 billion Pascagoula refinery retrofit was designed for Arabian Heavy crude. This is a 27° API gravity crude which would be considered a moderately light crude on the West Coast. Arab Heavy is similar to Alaskan North Slope crude in many ways.

As a result of these new refinery retrofit projects starting up in 1982 and 1983, imports of heavy crude have increased significantly. Most of the new heavy crude has come from Mexico and Venezuela. United States (PADDs I-V) imports of heavy crude (22° API and less) from Mexico increased from about 180 thousand BPD in the first quarter of 1982 to about 420 thousand BPD in the fourth quarter of 1982. Venezuelan heavy crude imports increased from 80 thousand BPD in the first quarter of 1982 to the 200 thousand BPD in the fourth quarter of 1982.

PADD III Future Prospects

PADD III refinery demand for crude oil should decrease from about 5.4 million BPD in 1982 to about 5.1 million in 1985 and remain essentially constant to the year 2000 (ADL 1984). The PADD III crude oil supply is forecast to change as the local light crude oil production decreases and the requirement for heavy crude oil increases as more refinery retrofit projects come on stream. Table G-4 provides the projected crude oil supply for PADD III in 1991. 1991 was selected since that is the projected peak year of production for OCS crude oil.

TABLE G-4

PADD III CRUDE OIL SUPPLY[1]

(Thousand BPD)

Supply	1982	1991 (ADL 1984)	1991 Study Team
Gulf Coast Production			
Low Sulfur Crude	2,719	1,812	1,812
High Sulfur Crude	1,464	1,296	1,296
Exports to other U.S. Refining Areas	(1,070)	(662)	(662)
Existing OCS Production	37	32	32
Alaskan Production	491	425	425
Heavy Mexican Imports	200	350	650
Heavy Venezuelan Imports	78	400	100
Other Imports	1,444	1,382	1,382
Total Supply	5,363	5,035	5,035

Source: Robert Brown Associates and All American Pipeline Company.

[1]Assume no additional OCS production being refined in PADD III.

About 278 thousand BPD of heavy crude oil was being imported into PADD III from Mexico and Venezuela in 1982. The study team believes that the heavy crude imports from Mexico and Venezuela will increase to about 650 and 100 thousand BPD, respectively, by 1991, assuming no additional OCS crude oil is being refined in PADD III. Our forecast of large increases in crude oil imports from Mexico and smaller increases from Venezuela is based on the production plans of those countries. Mexico is a relatively new oil producer, having commenced significant production during the 1970s. Mexico has a large development program to increase production even more. Venezuela is a very old oil producer, having many fields which were discovered in the 1930s and 1940s. The study team does not anticipate large increases in the volume of oil from the older fields of Venezuela.

Since PADD V refiners cannot refine all of the new OCS production, other areas of the United States will have to refine the OCS crude. The oil cannot be exported, since the Minerals Leasing Act limits the export of domestic crude. PADD III is the logical location for the OCS crude to be refined.

By 1991 between 200 and 500 thousand BPD of OCS crude will have to be exported to PADD III (Table G-5). Adequate processing capability should exist to accommodate 500 thousand BPD of the lower quality OCS crude oil. If the OCS crude were not available, 750 thousand BPD of high metal and relatively high sulfur Mexican and Venezuelan crude is forecast to be refined in PADD III. The OCS crude could displace a large portion of the high metal Mexican and Venezuelan crudes if transportation constraints are removed.

TABLE G-5

ESTIMATE FOR 1991 OCS CRUDE OIL PRODUCTION
TO BE REFINED IN PADD III
(Thousand BPD)

	Low Estimate	High Estimate
High estimate of OCS crude oil production	NA[1]	600
Low estimate of OCS crude oil production	500	NA
High estimate of OCS crude oil refined in PADD V	(300)	NA
Low estimate of OCS crude oil refined in PADD V	NA	(100)
Quantity of oil to be refined in PADD III	200	500

Source: Robert Brown Associates

[1]Not Applicable

Crude Oil Transportation

Effect of Getty and Celeron Projects. The existing transportation system for moving the OCS oil from the western Santa Barbara Channel and Santa Maria Basin to refining centers is inadequate. The surplus of OCS crude from the Gaviota Coastal area will require additional transportation systems. The proposed pipeline projects are a means of providing an interconnection to existing intra-state transportation systems and the proposed All-American pipeline in the Bakersfield area. From Bakersfield the oil can move to the refining centers located in the Los Angeles Basin, San Francisco Bay area, San Joaquin Valley of California, and PADD III.

The projected crude oil production of 500-to-600 thousand BPD is larger than the capacity of either of the proposed pipelines. Getty's project could be as large as 400 thousand BPD and Celeron's is planned for 300 thousand BPD. If both projects are built, then 700 thousand BPD of capacity would be available.

The All American proposal would move significant quantities of crude oil from PADD V to the markets in PADD III and Midwest provided the pipeline tariff is competitive with other transportation methods. OCS crude oil will be able to enter the system via the Getty and Celeron pipeline projects. San Joaquin Valley crude would be able to enter the system at Cadiz via the existing Four Corners Pipeline Company's Line 90 which runs to the Four Corners area of Utah from Long Beach. Marine terminals in the Long Beach-Los Angeles Harbor area connect to Line 90.

The ANS and light California crudes will be easily transferred from West Texas to most all refineries in PADDs I-IV. Adequate pipeline capacity exists in the extensive crude oil transportation network from West Texas to the refining centers in PADDs I-IV.

However, heavy San Joaquin Valley crudes and new OCS crudes are expected to require heated pipelines. They have too high a viscosity to be pumped at ambient temperatures. No heated pipelines exist in West Texas.

All American has asked the owners of the Rancho Pipeline to investigate the feasibility of heating their existing pipeline. The Rancho Pipeline runs from McCamey, in west Texas, to Houston. If the Rancho Pipeline could be converted, it would provide an important link for moving OCS crude to refineries in PADD III with the ability to process the OCS crude.

In the event the Rancho Pipeline cannot be used, All American has proposed building a new pipeline from McCamey to Freeport, Texas. The McCamey to Freeport pipeline alternative would increase the flexibility of the All American proposal by transporting the heavy OCS and San Joaquin Valley crudes closer to refining centers that can more easily accomodate them and provide direct connection to a marine terminal. The uncertainty associated with the potential retrofit of existing pipelines is eliminated.

The Freeport terminal provides for a direct connection to the Strategic Petroleum Reserve and the Phillips Sweeney refinery. The Phillips Sweeney plant is not expected to accomodate a large quantity of high metal-heavy-crude with its existing process configuration. The Freeport terminal also serves Dow Chemical's Oyster Creek refinery which was shut down in 1981. The refinery is not expected to reopen due to the excess supply of refining capacity in the United States. Exxon's 88,000 BPD Corpus Christi to Houston pipeline passes through the Freeport area. However, the line is not heated and could not accommodate heavy crude without modification. The feasibility of modifying the pipeline is not known.

Due to the unavailability of a pipeline interconnection and refineries in Freeport, it is anticipated that most of the heavy oil that is directed to Freeport would be loaded on to ships and barges and moved to the existing refining centers that are located along the Gulf Coast from Corpus Christi to Mississippi.

The cost of transporting heavy crude oil to Houston via the Celeron of Texas alternative is estimated to be about $0.95/bbl more than using the modified Rancho Pipeline interconnection proposed as part of the applicant's project. The total cost of transporting heavy crude from Las Flores Canyon to Houston via this alternative would be about $3.84/bbl (see Table G-6). This would still be much cheaper than building new ships and using them to transport the crude. Table G-7 indicates that the cost of using new ships is $7.71-8.69/bbl.

About one-third of the high metal and high sulfur crude oil refining capacity in PADD III exists in the Houston area. The balance of the high metal and high sulfur crude oil capacity exists along the Gulf Coast from Corpus Christi past Houston and into Mississippi. There is about 200 to 250 thousand BPD of high metals and sulfur heavy crude refining capacity in the Houston area. Any volume of high metal and sulfur heavy crude in excess of 200 to 250 thousand BPD would have to be shipped elsewhere in PADD III. The transshipment would likely occur by ship due to the lack of heated pipelines and logistical problems.

The economics of pipelines versus ships are summarized in Table G-7. The results presented are significantly different from the results presented in other studies. This is because of the study team's decision to put the two alternatives on an equal basis. The cost of transporting oil can be significantly altered by assuming different financing arrangements or different rates of return for the owner of the ship or pipeline. For example, Arthur D. Little, Inc. (ADL) estimated the cost of moving oil by a Las Flores Canyon to Midland, Texas, pipeline at $3.25 per bbl. This analysis shows a price of $4.75 for the ADL cost estimate. The difference is totally attributable to the assumptions used concerning financing and rate of return.

The financial basis selected was the basis provided by All American. It is a shortened version of the procedure used by the Federal Energy Regulatory Commission in the establishment of tariffs. The methodology is presented in Table G-8. Table G-9 provides a summary of the key assumptions made in the economic analysis concerning capital cost, operating costs, and throughput levels.

TABLE G-6

CALCULATION OF TARIFFS
ALLOWED RATE OF RETURN:
13.0 PERCENT
($1,000)

PIPELINE LINKS:	LAS FLORES - EMIDIO	EMIDIO - McCAMEY	McCAMEY - FREEPORT	BARGE FREEPORT - HOUSTON*	TOTAL TARIFF LAS FLORES TO HOUSTON
CAPITAL COST	95,000	605,000	240,000		
BOOK DEPRECIATION (30 YR) RATE @ MID-YEAR	(1,583)	(10,083)	(4,000)		
A. NET FIXED ASSETS @ MID-YEAR	93,417	594,917	236,000		
DEFERRED TAX LIABILITY					
TAX DEPR. YEAR 1 (15%)	14,250	90,750	36,000		
BOOK DEPR. YEAR 1	(3,167)	(20,167)	(8,000)		
DIFFERENCE BETWEEN TAX AND BOOK DEPRECIAITION	11,083	70,583	28,000		
B. DEFERRED TAX LIABILITY @ 50% OF DIFFERENCE BETWEEN TAX AND BOOK DEPRECIATION	5,542	35,292	14,000		
RATE BASE (A - B)	87,875	559,625	222,000		
NET RETURN ON RATE BASE	11,424	72,751	28,860		
OPERATING COSTS	7,600	59,000	25,000		
GROSS REVENUE					
NET RETURN ON RATE BASE	11,424	72,751	28,860		
TAX AT 50% OF GROSS RETURN	11,424	72,751	28,860		
OPERATING COSTS	7,600	59,000	25,000		
BOOK DEPRECIATION	3,167	20,167	8,000		
GROSS ANNUAL REVENUE REQUIREMENT	33,614	224,669	90,720		
DAILY CAPACITY (MBBL/DAY)	300	300	300		
ON-STREAM EFFICIENCY (%)	99.48	100.00	100.00		
TARIFF ($/BBL)	$0.31	$2.05	$0.83	$0.65	$3.84

* INCLUDES $.25 PER BARREL TERMINALING CHARGE FOR SEAWAY TERMINAL

CAPITAL AND OPERATING COST BASIS: ALL-AMERICAN PIPELINE CO., 1983 & 1984 AND ROBERT BROWN ASSO. FOR BARGE TARIFF ESTIMATE

TABLE G-7

CALIFORNIA OCS CRUDE TRANSPORTATION COST ANALYSIS

($/Barrel)

	Gaviota Coast/Houston Vessel (MDWT)[1]				Pipeline (300,000 BPD)			
	60(new)	60(old)	200/50(new)	200/50(old)	Las Flores/ Bakersfield	Bakers./ Midland	Midland/ Houston	Las Flores/ Houston
SOURCE								
ADL	8.69	4.65	7.71	4.11	0.59	4.16	2.26	7.00
Purvin and Gertz, Inc.	8.82	NA[2]	7.26[3]	NA	NA	NA	NA	NA
All-American[4,5]	NA	NA	NA	NA	0.31	2.05	0.53	2.89

Sources: ADL 1984, Purvin and Gertz, Inc. 1983, and Robert Brown Associates

[1]MDWT: Thousands of deadweight tons.

[2]Not Available

[3]Purvin and Gertz's 200/50 MDWT transportation cost analysis was based on 180 MDWT ships and 50 MDWT.

[4]Getty did not provide information for economic analysis.

[5]The Midland to Houston link includes the tariff for the existing Rancho Pipeline and a surcharge to pay for heating the line. ADL assumed a new pipeline.

TABLE G-8

CALCULATION OF TARIFFS
ALLOWED RATE OF RETURN:
13.0 PERCENT
($1,000)

PIPELINE LINKS:	LAS FLORES - EMIDIO	EMIDIO - McCAMEY	INCREASED TARIFF DUE TO HEATING McCAMEY - HOUSTON PIPELINE	EXISTING TARIFF McCAMEY TO HOUSTON	TOTAL TARIFF LAS FLORES TO HOUSTON
CAPITAL COST	95,000	605,000	7,562		
BOOK DEPRECIATION (30 YR) RATE @ MID-YEAR	(1,583)	(10,083)	(126)		
A. NET FIXED ASSETS @ MID-YEAR	93,417	594,917	7,436		
DEFERRED TAX LIABILITY					
TAX DEPR. YEAR 1 (15%)	14,250	90,750	1,134		
BOOK DEPR. YEAR 1	(3,167)	(20,167)	(252)		
DIFFERENCE BETWEEN TAX AND BOOK DEPRECIAITION	11,083	70,583	882		
B. DEFERRED TAX LIABILITY @ 50% OF DIFFERENCE BETWEEN TAX AND BOOK DEPRECIATION	5,542	35,292	441		
RATE BASE (A - B)	87,875	559,625	6,995		
NET RETURN ON RATE BASE	11,424	72,751	909		
OPERATING COSTS	7,600	59,000	12,833		
GROSS REVENUE					
NET RETURN ON RATE BASE	11,424	72,751	909		
TAX AT 50% OF GROSS RETURN	11,424	72,751	909		
OPERATING COSTS	7,600	59,000	12,833		
BOOK DEPRECIATION	3,167	20,167	252		
GROSS ANNUAL REVENUE REQUIREMENT	33,614	224,669	14,904		
DAILY CAPACITY (MBBL/DAY)	300	300	200		
ON-STREAM EFFICIENCY (%)	99.48	100.00	100.00		
TARIFF ($/BBL)	$0.31	$2.05	$0.20	$.33	$2.89

CAPITAL AND OPERATING COST BASIS: ALL-AMERICAN PIPELINE CO., 1983

Sources: Robert Brown Associates and All American Pipeline Company

TABLE G-9

CALIFORNIA OCS CRUDE TRANSPORTATION COST BASIS

(Millions of Dollars)

	Gaviota Coast/Houston Vessel (MDWT)[1]				Pipeline (300,000 BPD)			
	60 (new)	60 (old)	200/50 (new)	200/50 (old)	Las Flores/ Bakersfield	Bakers./ Midland	Midland/ Houston	Las Flores/ Houston
Capital Costs								
ADL[2]	93.0	28.0	263.0	74.0	197.4	1,303.7	467.0	1,968.1
Purvin and Gertz, Inc.[2]	95.0	NA[3]	252.0[4]	NA	NA	NA	NA	NA
All American[5]	NA	NA	NA	NA	95.0	605.0	7.6[6]	707.6
Operating Costs (Annual)								
ADL[2]	11.2	10.7	35.9	34.4	10.0	98.4	37.0	145.4
Purvin and Gertz, Inc.	11.4	NA	24.0[4]	NA	NA	NA	NA	NA
All American[5]	NA	NA	NA	NA	7.6	59.0	12.8[6]	79.4

TABLE G-9 (CONTINUED)

	Gaviota Coast/Houston Vessel (MDWT)[1]				Pipeline (300,000 BPD)			
	60 (new)	60 (old)	200/50 (new)	200/50 (old)	Las Flores/ Bakersfield	Bakers./ Midland	Midland/ Houston	Las Flores/ Houston
Daily Throughput (thousand BPD)								
ADL[2]	11.6	10.8	65/21	61/20	300	300	300	300
Purvin and Gertz, Inc.	11.6	NA	58/21[4]	NA	NA	NA	NA	NA
All American[5]	NA	NA	NA	NA	300	300	200[6]	NA

Sources: ADL 1984, Purvin and Gertz, Inc. 1983, and Robert Brown Associates

[1]MDWT: Thousands of deadweight tons.

[2]Ship costs are per ship and not for the total number of ships required to move the projected OCS crude oil.

[3]Not Available

[4]Purvin and Gertz's 200/50 MDWT transportation cost analysis was based on 180 MDWT ships and 50 MDWT.

[5]Getty did not provide information for economic analysis.

[6]All American Pipeline Company assumes that Midland-Houston link is just a crude oil heating retrofit to the existing Rancho Pipeline. ADL assumed a new pipeline.

The analysis indicates that if All American can build the pipeline for about $700 million, then the pipeline is clearly the most economical option for moving the oil to Houston. The pipeline is still the most economical option if new ships are required and the ADL capital cost estimate is correct. All American has reported that it has received construction bids from qualified construction contractors to complete the pipeline within All American's original estimate of about $700 million.

The availability of ships has a large impact on the economics of transporting the crude oil by ship. All freight between U.S. ports must be carried on U.S. ships. The U.S. fleet has numerous old ships which will not meet future environmental requirements and must be retired. If there are not enough ships, rates will increase to a level to justify the construction of new ships. The availability of ships is uncertain due to the uncertainty associated with crude oil production volumes. Therefore, the costs for new ships and old ships have been presented.

APPENDIX H

PRELIMINARY DRAFT

OIL SPILL CONTINGENCY AND EMERGENCY RESPONSE PLANS FOR THE CELERON/ALL AMERICAN AND GETTY PROPOSED PIPELINES

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[1]To be provided when applicants' final design is complete

1.0 INTRODUCTION

1.1 Purpose of the Plan

This manual contains the Oil Spill Contingency and Emergency Response Plan for the ______ located at __________. The plan is designed to assist the operator's personnel and contractors in responding rapidly and effectively to oil spills that may result from the operation of the pipeline. Major discharges of hazardous materials and the cumulative effect of numerous small discharges may have undesirable effects on our environment and generate complex technical, legal, governmental and public relations problems that require coordination of many individuals and agencies. The purpose of this Contingency Plan is to provide, when an accidental discharge does occur, an integrated and expeditious response to the emergency.

This plan was taken in part from the "Sohio West Coast Mid-Continent Pipeline Oil Spill Contingency Plan" (Woodward-Clyde 1977) and the "Conceptual Oil Spill Contingency Plan and Emergency Response Plan for the Getty Gaviota Consolidated Coastal Facility" (Getty Trading and Transportation Company 1983c).

This plan outlines the equipment and operational procedures utilized by the spill response teams in preventing, reporting, and containing oil spills and the subsequent restoration activities. The overall philosophy of the plan is to prevent spills to the greatest degree possible through the training of personnel and to contain and mitigate spill impacts if one should occur. Although this plan deals primarily with the reaction to an accidental discharge, it must be emphasized that <u>prevention</u> of pollution is the primary concern of the operator. This plan shall be regularly updated and reviewed per the identification of more efficient equipment and response procedures.

Each recipient of this plan should read it throughly and know the response procedures outlined herein. Personnel with job assignments under this plan should pay particular attention to their job descriptions and the resources available to help them deal quickly and efficiently with any spill emergency. Every facility employee is expected to accept the policies and procedures outlines herein and to conduct all activities in a manner which prevents pollution from occurring.

1.2 Legislative Authority

Several agencies exercise authority over pollution prevention and response measures occurring in the nearshore and offshore environment as related to oil industry facilities. There are numerous state, county and Federal agencies which require some type of oil spill contingency plans applicable to the pipeline facility. The respective jurisdictions of these agencies with regard to the pipeline facility and brief descriptions of the plan requirements are presented in Table 1-1 (Required Oil Spill Contingency Plan Authorizations, to be provided when final project design is completed).

1.3 Scope of the Oil Spill Contingency/Emergency Response Plan

The formulation of an oil spill contingency/emergency response plan is based on several fundamental planning objectives which, considered together, provide a safe and efficient response to an oil spill or other pollution incident. This plan has been designed in accordance with, and will implement, the regulations and performance standards established by the __________, ___________, ___________ and Environmental Protection Agency. The principal components of the contingency plan are summarized below.

1. Designation of the members of the oil spill task force within the company, their responsibilities, and communication procedures.

2. A listing of persons and governmental agencies to be contacted in the event of a spill and the information and time requirements for notification.

3. A description of specific response procedures as a function of spill size and the characteristics of areas potentially affected, such as streambeds and areas of special biological significance.

4. An inventory of the spill containment and cleanup equipment at the site and at proximate locations that could be mobilized in the event of an emergency.

5. Training procedures for personnel including a description of methods for recovering spilled oil and disposing of oil-contaminated material.

6. A listing of the locally and regionally available manpower and contractors providing specialized cleanup equipment and expertise.

7. A discussion of oil spill and fire prevention techniques and equipment incorporated into the design of the facility and routine monitoring practices for detection of pollution or equipment malfunction.

The best method of protecting the environment is to prevent the discharge of pollutants into the environment. The facility operations will be conducted in a manner that will prohibit, to the greatest extent possible, the discharge of oil (either diesel fuel, lube oil, or crude oil) or any potentially harmful pollutants.

First and foremost, the scope of this plan is to provide a concise and informative manual for facility employees and management to delineate emergency response procedures and specific responsibilities in the event of an oil spill incident. The content and organization of the plan facilitates ready reference to the notification and immediate response procedures that must be initiated. Each employee is required to be familiar with the plan's containment methods and individual job descriptions, and should not have to consult the plan in an actual emergency other than to start call-up procedures to management and response agencies.

Section 2.0 of this plan provides training instructions and job descriptions for members of the spill response teams. The job descriptions as they relate to the spill response team include the purpose of that position, job responsibilities and company call-up duties. Also incorporated in this section are equipment and operating instructions for the oil spill communications systems, and interrelationships between the operator, government agencies and clean-up specialists.

Section 3.0 describes immediate response procedures, including notification procedures and initial actions.

Section 4.0, Containment and Cleanup Procedures, describes specific contigency areas and segments along the pipeline route; containment techniques and procedures; oil cleanup techniques; restoration of spill-affected areas; and means of disposal for recovered spill oil and contaminated materials.

Section 5.0, Oil Spill Equipment, provides a list of the operator's general equipment available, and special equipment designated for specific districts along the pipeline route. Equipment lists are also provided for cooperatives and private contractors that may be called upon to assist in the event of a major spill. Estimated response times for all potential clean-up response groups is also indicated.

Section 6.0 of this plan provides background information regarding the type of spills that could potentially occur along the pipeline, the maximum discharge, and probable direction of flow prior to containment and clean-up. This section also contains general information about the pipeline, and the specific maintenance, monitoring and hazard prevention features incorporated into the design of the facility.

Section 7.0, Reports and Documentation, discusses the method for reporting pollution incidents to appropriate government agencies following the oil spill incident. The State Lands Commission, EPA, and____, require that written pollution reports be submitted documenting where and when the spill occurred, the amount spilled, cause of spill, description of area affected and actions taken to combat the spill.

The proper procedure for notifying and dealing with the media and government agencies at the time of a spill incident is provided in Section 8.0.

Section 9.0 of this plan, Fire Protection Plan and Emergency Access and Evacuation Plan are complete plans in and of themselves and were developed to respond to potential fire hazard or explosion incidents. These plans have been incorporated herein as part of ____ County's requirement for Emergency Response Plans and to facilitate the provision of a complete response manual for onsite employees.

Section 10.0 provides maps and tables of biologically (or otherwise) sensitive areas along the pipeline route that would suffer significant impacts in the event of oil spill.

1.4 Project Location and Regional Response Centers

A complete description of the proposed project can be found in Section 2.0 of the Draft EIR/EIS.

Regional response centers locations, and operations manpower are provided in Figure 1-1 (Regional Response Centers Locations, And Operations Manpower, to be provided when applicants' final design is complete).

1.5 Company Policy and Plan Updating

The operational goal for the pipeline facility is to prevent any oil spillage. However, should spillage occur, the response actions prescribed in this plan will be followed. The operator commits to the expeditious control and cleanup of any accidential discharges with minimum impact on the surrounding environment.

A notice will be distributed periodically to all plan recipients advising that this plan is being updated. Each recipient should reply by including any recommended changes at that time. In this manner, the plan will be kept current. All changes of the plan must be reviewed and approved by the State Lands Commission and the County of Santa Barbara Emergency Services Coordinator, other states and counties, and EPA.

Revisions to this plan will be transmitted to holders of the plan as an update memorandum of the type shown on page ___. Upon receipt of the revisions, the holder of the plan should replace the pages as instructed and post the change on page ___. Since all revisions will be consecutively numbered and dated, review of this page will reveal the completeness of the manual.

2.0 OIL SPILL TASK FORCE

2.1 Management

The organization of the Oil Spill Task Force is broken into four major categories according to their functions in implementing the plan. These are:

- Management
- Operations
- Support
- Advisory

The relationship of these functions is illustrated in Figure 2-1.

The Oil Spill Task Force was created in order to assign individuals to specific job responsibilities in each of the four major categories. Oil Spill Task Force supervisory positions are graphically depicted in Figure 2-2. In interpreting the Task Force organization, it is

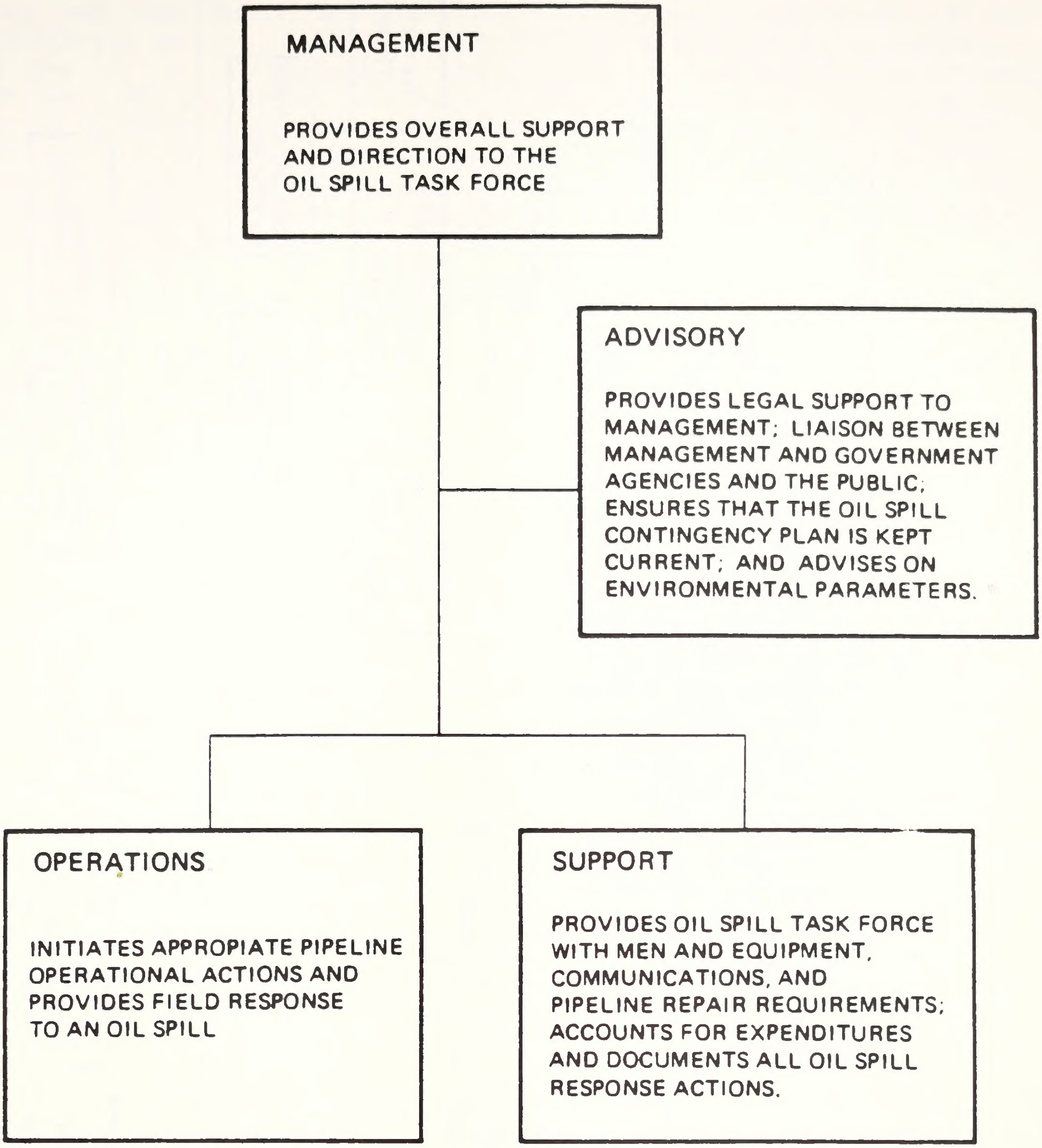

Figure 2-1 CONTINGENCY PLAN RESPONSE FUNCTIONS

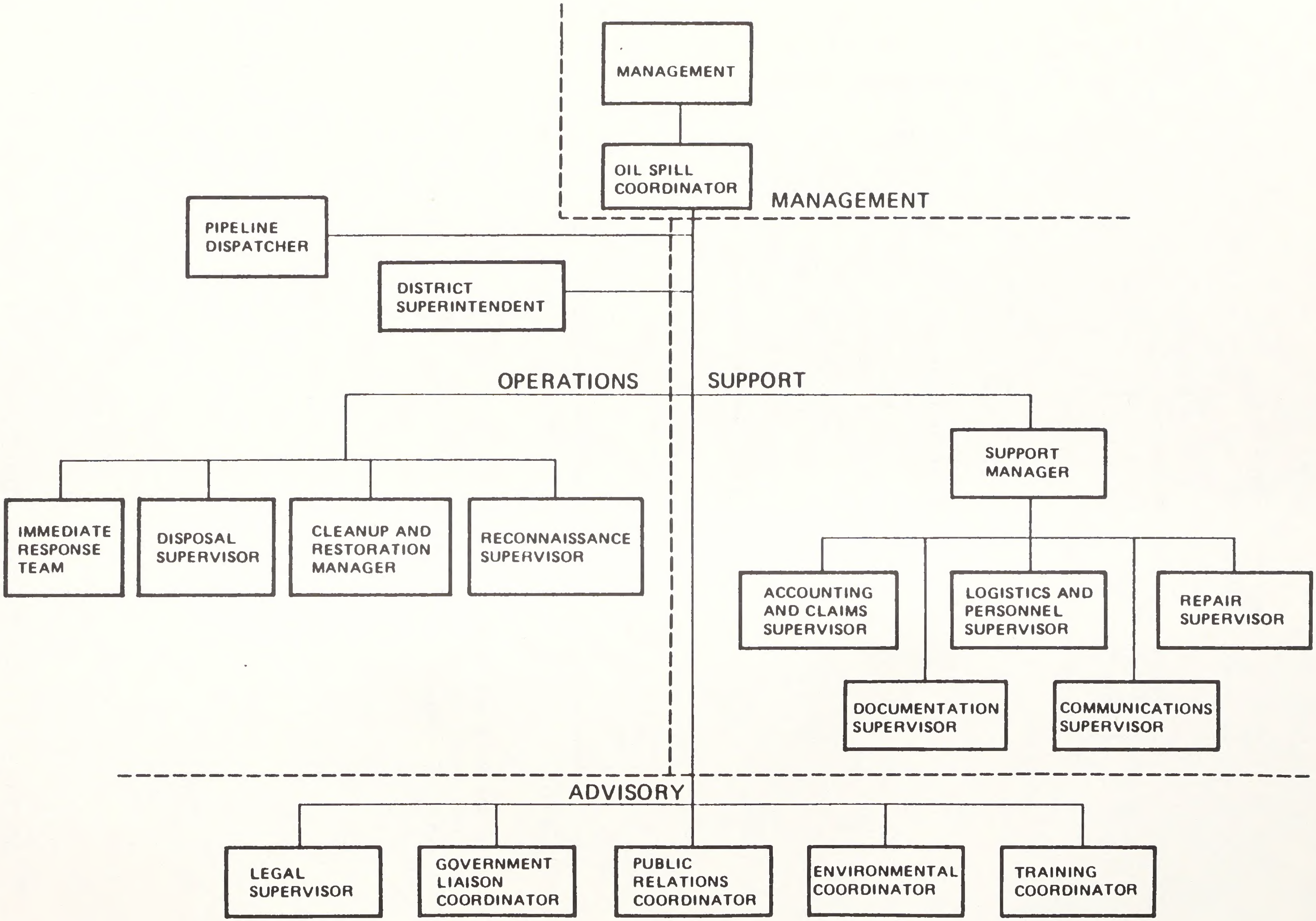

Figure 2-2. OIL SPILL TASK FORCE SUPERVISORY POSITIONS

important to note that positions reflecting specific job responsibilities, not individuals, are presented. The number of people required to effectively respond to an oil spill will depend upon the characteristics of the oil spill, especially the location of the spill, the volume spilled, and the extent and type of area contaminated. For example, during a minor spill the Support Manager may be able to efficiently perform all of the non-field functions under his supervision (i.e., logistics and personnel, accounting, claims, documentation, and communications); however, a major spill may require one or more individuals for each position of responsibility.

2.2 Task Force Job Descriptions and Responsibilities

The following paragraphs describe the role each of the major functional categories assumes during an oil spill and introduces the supervisory positions required to effectively carry out the responsibilities of each category.

Management

During an oil spill, _________ Management responsibilities center on providing overall authority and direction of all oil spill response activities. _______ Management will designate an Oil Spill Coordinator who will act as its representative during an oil spill and who will direct the actions of the entire Oil Spill Task Force. The Oil Spill Coordinator will provide overall supervision for oil spill response operations.

Operations

The Pipeline Dispatcher may initiate the Oil Spill Contingency Plan if he detects a spill or the District Superintendent may initiate the Plan if he receives the initial notification of a spill. The District Superintendent will initiate Immediate Response Actions as soon as he is notified of a spill and will provide field supervision of Immediate Response Actions and subsequent containment and cleanup operations. The individual receiving the spill notification will notify the Oil Spill Coordinator.

To initiate Immediate Response Actions, the District Superintendent will alert and mobilize the operating personnel within the affected District who are assigned to the Oil Spill Task Force positions of Cleanup and Restoration Manager, Reconnaissance Supervisor, and Immediate Response Team and direct them to undertake the proper Contingency Area Immediate Response Actions. Individuals occupying these positions in each District will be available on a 24-hour basis. The primary responsibility of immediate response personnel is to rapidly locate the spill and initiate Control and Protection Actions for oil spills anywhere along the pipeline route. The District Superintendent will alert and mobilize other members of the Oil Spill Task Force within his District as required during subsequent containment and cleanup operations.

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When the District Superintendent joins the Immediate Response Team, he will assume overall immediate response field control. If Protection Actions are undertaken, generally the Cleanup and Restoration Manager will assume field control. The Pipeline Dispatcher will act as the communications link between the _______ Control Center and Oil Spill Task Force personnel in the field. Figure 2-3 illustrates the immediate response organization for a District. The actions to be initiated will depend on the spill location. It must be emphasized that personnel assigned to these immediate response functions will continue to be a part of the Task Force throughout all phases of oil spill response as assigned by the Oil Spill Coordinator and the District Superintendent. The specific functions of the Immediate Response Team are also discussed in Section___ of each Contingency Area within each District oil spill plan.

After immediate response Protection Actions are completed or if they are not required, the Cleanup and Restoration Manager will direct oil spill cleanup operations. The Reconnaissance Supervisor will maintain surveillance of the spill and relay spill movement information to the District Superintendent. Cleanup actions will require close coordination between all operations, support, and advisory personnel. The Environmental Coordinator will be consulted prior to cleaning up affected areas.

The District Superintendent will keep the Oil Spill Coordinator informed as to spill conditions and the containment and cleanup operations taken. If additional personnel, equipment, or other assistance is required during oil spill response operations, the District Superintendent will notify the Oil Spill Coordinator of his requirements. The Oil Spill Coordinator will provide for the needs of the District Superintendent. If assistance is obtained from a contiguous District, the District Superintendent of the affected District will direct their actions. The Documentation Supervisor will ensure that <u>all</u> oil spill response actions are recorded from initial notification until completion of operations.

<u>Support</u>

Support activities will aid the field operations discussed in each Contingency Area and District oil spill plan. The Support Manager will direct these operations. He will be responsible for supplying personnel and equipment, maintaining a communications system, documenting support actions, and recording expenses and damage claims. If the spill is large, individuals will be assigned to perform the required actions. Specifically, the Support Manager will coordinate and direct the actions of the Logistics and Personnel Supervisor, the Documentation Supervisor, the Accounting and Claims Supervisor, and the Communications Supervisor and will support the Repair Supervisor. The Support Manager and support personnel may be pipeline operating personnel within the District. These positions will generally be occupied by the same individuals, except for the Documentation Supervisor and Repair Supervisor, for the entire pipeline.

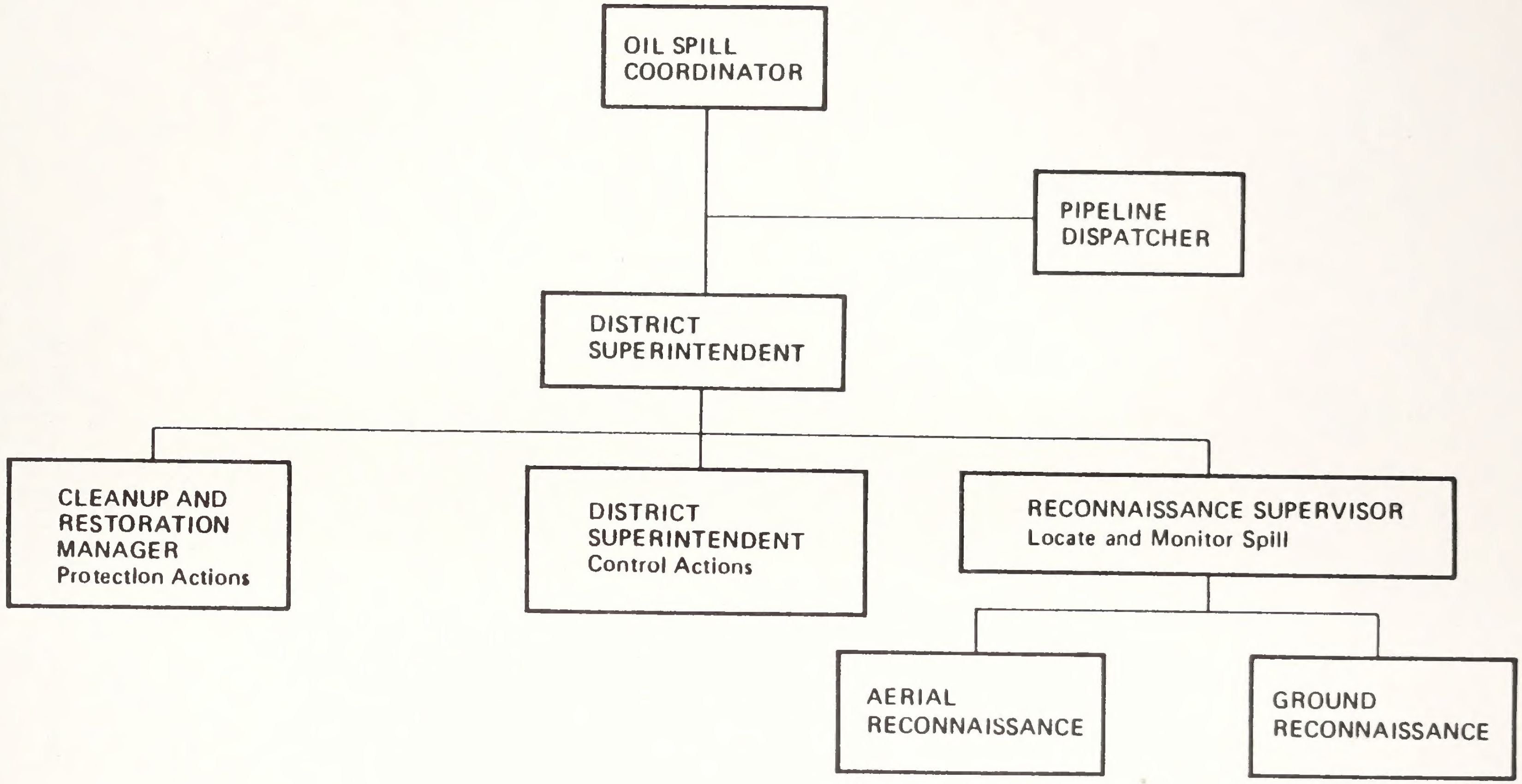

Figure 2-3. IMMEDIATE RESPONSE ORGANIZATION

Advisory

Included on the Oil Spill Task Force are personnel who can provide support for ancillary activities related to oil spill containment and cleanup operations. The Oil Spill Coordinator will be able to draw on the resources of a Legal Advisor, a Government Liaison Coordinator, a Public Relations Coordinator, an Environmental Coordinator, and a Training Coordinator when making decisions regarding an oil spill.

OIL SPILL TASK FORCE

The Oil Spill Task Force positions are listed in Table 2-1. The number of people required to fill the Task Force positions depends upon

TABLE 2-1

OIL SPILL TASK FORCE POSITIONS

Function	Subsection	Position[1]
Management	201	Management
	202	Oil Spill Coordinator
Operations	203	Pipeline Dispatcher
	204	District Superintendent[2]
	205	Cleanup and Restoration Manager[2]
	206	Immediate Response Team[2]
	207	Reconnaissance Supervisor[2]
	208	Disposal Supervisor[2]
Support	209	Support Manager
	210	Logistics and Personnel Supervisor
	211	Communications Supervisor
	212	Documentation Supervisor[2]
	213	Accounting and Claims Supervisor
	214	Repair Supervisor[2]
Advisory	215	Legal Advisor
	216	Government Liaison Coordinator
	217	Public Relations Coordinator
	218	Environmental Coordinator
	219	Training Coordinator

[1]Detailed Job Descriptions and Responsibilities to be provided by applicants when final design is complets.

[2]Each District will have District level personnel filling these positions.

the magnitude of the spill. One individual may occupy several Task Force positions for a small spill, but a major spill will require a minimum of one individual per position. Each District will have individuals assigned to the following Oil Spill Task Force positions:

- District Superintendent
- Cleanup and Restoration Manager
- Immediate Response Team
- Reconnaissance Supervisor
- Disposal Supervisor
- Documentation Supervisor
- Repair Supervisor

The remaining Task Force positions will generally be filled by individuals who are responsible for performing the assigned function for the entire ___________ Pipeline.

Initial notification of immediate response Task Force members will be accomplished by the District Superintendent. Once the Oil Spill Coordinator has been notified, he will assume overall control of all oil spill response operations and will alert or mobilize additional members of the Task Force as necessary.

Once the plan is activated, operations will generally be conducted 24-hours a day until the spilled oil is satisfactorily contained and cleaned up. The various Task Force members and their specific job descriptions and responsibilities are given in Sections 201 through 219, as shown in Table 2-1. Lists of personnel and their office and home telephone numbers are included for each job description. The listed positons are to be filled by personnel who normally have other responsibilities. In the event of an oil spill, the listed duties will supersede normal operating responsibilities. However, certain emergency situations, such as a shutdown, may require operating personnel to maintain their positions.

2.3 Training

2.3.1 Training Schedule

All Oil Spill Task Force members, as discussed in Section 2.2 (Job Descriptions), shall receive training in the operation, maintenance, and deployment of the containment/cleanup equipment applicable to their function. Alternates should also be scheduled to receive spill training. Instruction will be provided in the proper use of chemical collecting agents, dispersants, and solvents. Training drills will be conducted prior to facility operation and thereafter at least quarterly to maintain crew proficiency. These drills will include full deployment of all containment and cleanup equipment with the exception of chemical application. These drills can be held separately or simultaneously with drills and demonstrations conducted by organizations or oil spill cooperatives. Personnel must develop maximum familiarity with all aspects of the Oil Spill Contingency Plan and Emergency Response Plan, particularly with the immediate response procedures.

The Training Coordinator is responsible for the organization of a periodic training program for all personnel in the Response Teams. The objectives of this training program are:

- to maintain the plan as a fully operable working document
- to inform team members of their respective duties and of standard communication procedures
- to familiarize Team members with the use of all equipment
- to update the plan so that it includes all new equipment and procedures
- to modify the plan on the basis of information gained from field exercises.

2.3.2 Field Exercises and Drills

The training program will include:

- field demonstrations and tests of new equipment and procedures

- drills to test immediate response actions

Full-scale field demonstrations will be held to train and instruct all Onsite Response Team personnel in the use of oil spill response equipment. Arrangements will be made with oil spill cooperatives to conduct field demonstrations, and equipment manufacturer representatives will be consulted as necessary during the initial phase of the demonstrations. Field exercises will include demonstrations of the deployment, operation, recovery, and maintenance of all equipment. Recommended beach- and rock-cleaning techniques and the care and rehabilitation of contaminated wildlife will also be demonstrated.

Oil spill response drills will provide the Response Teams with practical experience in response operations and will help to maintain the Contingency Plan as a working document. The drills will include response actions (such as notification, immediate response actions, assessment, containment, exclusion, cleanup, and documentation) called for by the hypothetical spill. The necessary boom types and skimmers will be deployed so that personnel can develop the operational skill required for their efficient mobilization.

2.3.3 Critique and Discussion

Following all field exercises, a meeting will be held in which the Contingency Plan will be discussed and evaluated in light of the training drill, and the plan and training program will be modified accordingly. The Training Coordinator or his designate will conduct the critique, prepare a report describing the results of the drill, and suggest changes in the contingency organization and plan, if necessary.

2.3.4 Reference Publications

The Training Coordinator will receive from the Environmental Protection Agency, American Petroleum Institute, and United States Coast Guard published reports and training films related to ongoing and completed oil spill research projects. He will also attend conferences at which oil spill technology is discussed. Table 2-2 (Current Reference Materials, to be provided by applicants when final design is complete) lists current reference materials that should be made available to the Response Team by the Training Coordinator.

The training program should be based upon the discussion presented in Section 4.0, Containment and Cleanup Procedures.

2.3.5 Oil Spill Cooperative Equipment

Personnel with jobs that require large oil spill control knowledge, as related to utilization of oil spill cooperative equipment, shall receive information or training on equipment related to their jobs. The Coordinator and Supervisor will participate in Oil Spill Cooperative training programs and will become familiar with the operation of all Cooperative equipment.

2.3.6 Oil Spill Contingency Plan

All key personnel for small and large spill operations shall receive a copy of the "Oil Spill Contingency Plan." Each will be required to submit to the Area Manager(s), County(s) Area Office, a signed statement that the plan as related to his/her responsibilities is fully understood.

2.4 Other Oil Spill Response Teams

In addition to individual operator contingency plans, Federal and state contingency plans and oil spill response teams are also in effect. These governmental levels of response and their relationship to the operators contingency plan in the event of a major spill incident is described below.

2.4.1 Federal Response

A Federal response is comprised of several different levels of response. These are the National Response Team, National Strike Force, the Regional Response Teams and at the local level, the designated On-Scene Coordinator (OSC). The relationship among these various response teams at the Federal level is shown in Figure 2-4.

Pursuant to Section 311(c)(2) of the Federal Water Pollution Control Act of 1970, a National Oil and Hazardous Substances Pollution Contingency Plan (NCP) was established in 1973 and amended in 1975. The NCP provides for: (1) the assignment of cleanup responsibilities to various Federal agencies in coordination with state and local entities; (2) establishment of a national center for the direction of operations, and (3) establishment of strike and task forces to carry out the plan. The body with overall responsibility for implementation of the plan is the National Response Team (NRT), composed of representatives of several cognizant Federal agencies such as the Departments of Commerce, Defense, Interior, Health and Human Services, Transportation (U.S. Coast Guard), and the Environmental Protection Agency.

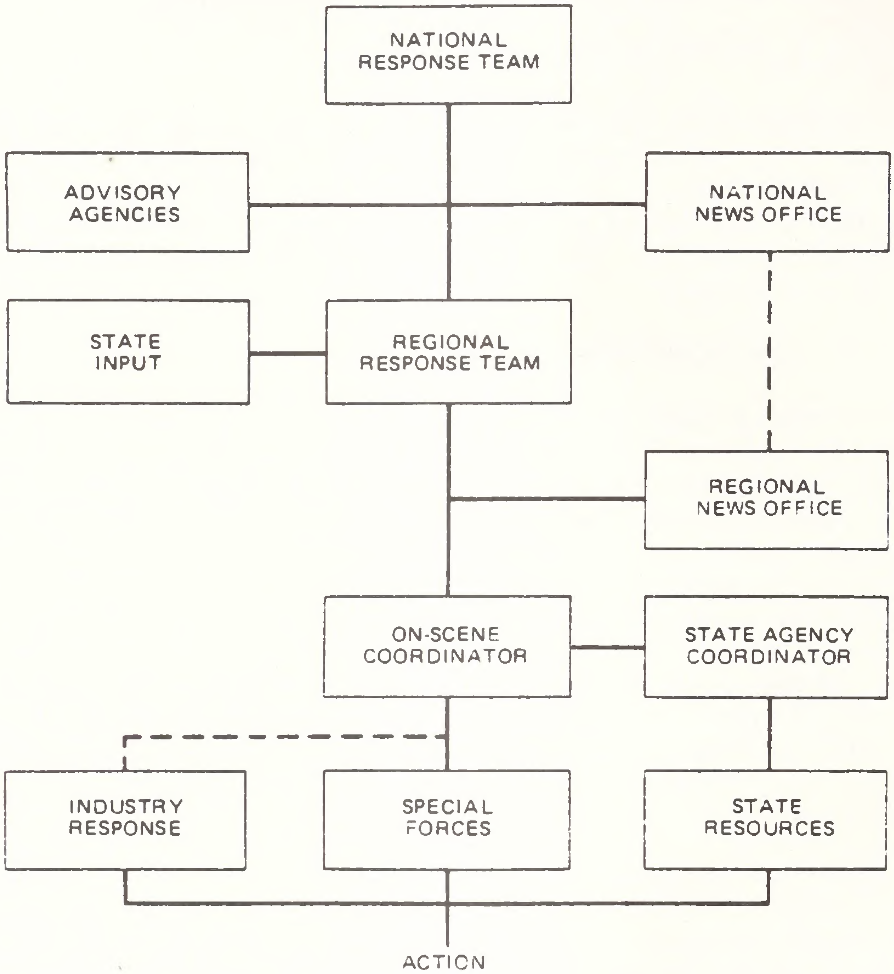

Figure 2-4. Federal Oil Spill Response

The Department of Transportation, U.S. Coast Guard, is responsible for the protection of coastal waters, the great lakes, and for ports and harbors. As such, the U.S. Coast Guard has established strike forces and Regional Response Teams to provide this protection. The southern California coastal area is the jurisdiction of the Pacific Strike Team, based in San Francisco. Within 2 hours of notification, the Pacific Strike Team can provide at least four trained personnel to the spill site at the request of the On-Scene Coordinator, the Coast Guard or the commanding officer of the Strike Team.

The governing contingency plan for the southern California coastal region is the Region IX Multi-Agency Oil and Hazardous Materials Pollution Contingency Plan, subregional Plan for Zone One, Southern California. Zone One is contained within the jurisdiction of the 11th Coast Guard District, the commander of which serves as the On-Scene Coordinator (OSC) for all spills and is the key Federal official onsite. The Regional Response Team is under the direction of the OSC and is composed of the following knowledgeable agency officials: The Direction of Surveillance and Analysis Division of the Regional Environmental Protection Agency, Commander of the U.S. Western Air Force Reserve Region; Director of the California Office of Emergency Services; and representatives from the U.S. Corps of Engineers, the 11th Naval District, 6th U.S. Army Headquarters, U.S. Fish and Wildlife Service, and Regional Oil and Gas Division of the U.S. Geological Survey.

In responding to a spill incident, the OSC will encourage the responsible parties to take the initiative in correcting the problem if they are able; if they are not, the OSC will activate the Regional Response Team, Pacific Strike Team and State Response Teams, as necessary. The OSC is responsible for the adequacy of the spill response operation and will maintain surveillance over the operations until completed satisfactorily. Personnel are required to comply with all OSC directives concerning spills in the vicinity of the marine terminal or facility.

2.4.2 State Response

The State of California Oil Spill Contingency Plan provides for a coordinated response of state agencies to an oil spill. The plan designates a State Operating Authority (SOA) who will represent the state on the Federal Regional Response Team and have the authority to declare an oil spill emergency requiring the activation of the State Contingency Plan. A representative of the California Department of Fish and Game has been designated as the current State Operating Authority.

As shown in Figure 2-5, the State's organizational framework for response to a major spill is multi-level. A State Support Team (SST) consisting of various State Department directors will authorize the SOA and administer a standing State Interagency Oil Spill Committee (SIOSC). The SIOSC functions as a liaison with public and private oil pollution control organization, reviews the State Contingency Plan, and recommends

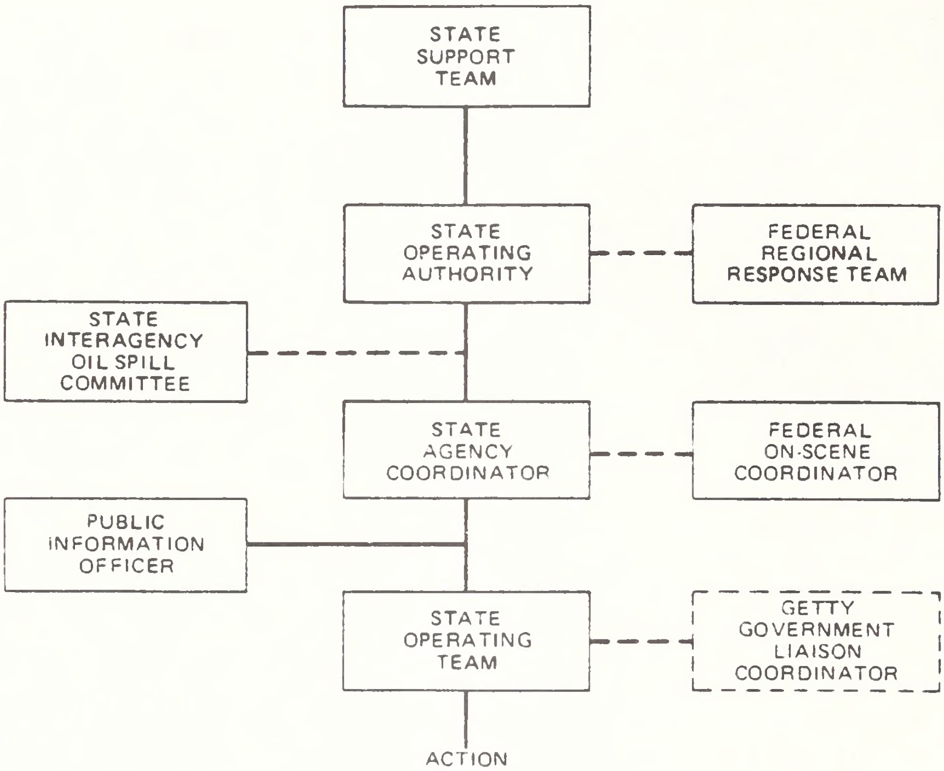

Figure 2-5. California Oil Spill Response

research and development. The SOA appoints a State Agency Coordinator (SAC) who will be in charge of all state agencies engaged in combating a pollution incident. These agencies comprise the State Operating Team (SOT). The State Agency Coordinator will also act in a capacity similar to that of the Federal On-Scene Coordinator.

The Area Manager and Outside Agencies Coordinator will work with the State Operating Team and the SAC to provide a safe and efficient response effort. Personnel will comply with the directives of the SAC in the event of a spill emergency.

Other State Response Team organizations are shown in Figures _____ through _____.

2.5 Communications

2.5.1 Introduction

This section summarizes the communications and control system for the pipeline facility. This system has been designed to provide adequate communications, control and monitoring for both onsite and offsite operations. An oil spill whether large or small would be detected almost immediately as the facility is continuously monitored and inspected. Once detected, the notification sequence should be followed as outlined in Section 3.0 of this document.

If a major oil spill were to occur, the communication or control center would be established as the Command Post in which the Operations Supervisor would coordinate the appropriate actions. The Command Post will also provide direct communication with the State and Federal On-Scene Coordinators who are responsible for overseeing the spill response operations.

2.5.2 Supervisory Control Center

The control center will control all of the pumps associated with movement of crude oil into and out of the storage tanks, and will include:

- level of all tanks
- pumping rates in all lines
- oil temperature in tanks
- pump suction and discharge pressures
- on/off condition of each pump
- open/closed positions of all valves

Supervisory control over the crude oil pipeline will also be exercised from the control center. From this station, control can be exercised over the entire pipeline operation via microwave or leased line feedback from the central plant and the intermediate boosting stations. The supervisory control and data acquisition system operation would encompass overall pipeline operations control, automatic custody transfer inputs, and pipeline leak detection, alarming, and shutdown.

The control station originates remote control commands and receives status and alarm data from the remote terminal units (RTU). The RTU receives and executes valid commands from the master station and transmits alarm and status information to the master station. Standby power is provided for the RTUs to insure operation when commercial power fails. A communications system provides for transmission of the data to and from the master station. The detailed data are provided to the master station in a visual and hardcopy format. A computer is used as the controlling element for the system. Redundant computers and peripheral equipment are provided at the master station to increase reliability and allow for maintenance and repair without disrupting normal pipeline supervision and control. The computers are programmed to continuously scan for alarms.

The leak detection method for this system employs the operational pipeline measurement devices, integrated into the supervisory control and data acquisition (SCADA) system as discussed above. This leak detection concept has traditionally been referred to as the volume balance method. Using data accummulated and transmitted by the SCADA system, the difference between the fluid inflow and outflow is calculated. Based on actual pipeline system test and analysis, volume balance thresholds are established. These thresholds are then programmed into the SCADA system and appear as alarms to the master station if the thresholds are exceeded.

This leak detection concept is based on the assumption that the fluid volumes lost to leakage will result in a discrepancy between metered inlet/outlet volumes and calculated changes in the pipeline fluid inventory. This volume balance method of leak detection is well suited to this application. The volumes in the pipeline will be continuously corrected in the SCADA system computer for temperature, pressure, and gravity.

A CRT and keyboard will allow the operator to control, program, and monitor the operations. An annunciator will be provided for important alarm points. A printer will log important data and alarm points.

3.0 IMMEDIATE RESPONSE PROCEDURES

3.1 Notification Procedures

Within each Contingency Area oil spill plan, procedures are given for notifying the proper Oil Spill Task Force members and local agencies. Only individuals and organizations required to initiate Immediate Response Actions are to be contacted by the District Superintendent during the immediate response phase of oil spill response. The individual receiving the initial notification of a spill will notify the Oil Spill Coordinator. If it is a monitored spill, the Pipeline Dispatcher will notify the Oil Spill Coordinator. If it is a spill that has been located by routine patrols or an outside party, the District Superintendent receiving the notification will notify the Oil Spill Coordinator. The Oil Spill Coordinator or his designated representative is responsible for carrying out notification procedures.

The notification sequence for an oil spill is depicted in Figure 3-1 (Notification Procedure Flow Diagram, to be provided by applicants when final design is complete). A list of Task Force members to be notified is given in Table 3-1 (List of Task Force Members, to be provided by applicants when final design is complete).

3.2 Initial Actions

Immediate Response Actions are actions that are taken immediately upon receiving notification of a spill or potential spill. The actions are initiated by the pipeline operational organization upon receiving the notification. The Oil Spill Contingency Plan presents Immediate Response Actions that are designed (1) to mobilize Oil Spill Task Force members and to alert appropriate Federal and local agencies, (2) to minimize the volume of oil spilled by initiating and carrying-out pipeline operational actions, (3) to locate a visually unconfirmed spill or to monitor the movement of a visually confirmed spill, (4) to limit the spread of an oil spill, (5) to protect areas that are particularly sensitive to oil spills, and (6) to provide a record of all actions taken in response to an oil spill.

Specific Immediate Response Actions have been developed for each Contingency Area within each District and are contained in the following sections of each Contingency Area oil spill plan:

- Pipeline Operational Actions
- Reconnaissance
- Control Actions
- Protection Actions
- Documentation

Immediate response actions are given in Figure 3-2 (Immediate Response Action Flow Chart, to be provided by applicants when final design is complete).

4.0 CONTAINMENT AND CLEANUP PROCEDURES

This section discusses the development of Contingency Areas and segments, containment techniques and procedures, cleanup techniques, restoration of spill damaged areas, and disposal of oily wastes. The methodology discussed in the following sections was used in the development of the Contingency Plan and should be implemented in the event of an oil spill:

- Development of Contingency Areas and Segments
- Containment Techniques and Procedures
- Oil Cleanup Techniques
- Restoration of Spill Affected Areas
- Disposal

4.1 Development of Contingency Areas and Segments

Each of the operational units (Districts) along the pipeline route has been divided into Contingency Areas which in turn have been divided into segments. Contingency Areas are separated from adjacent

Contingency Areas by (1) major drainage divides or (2) major changes in drainage characteristics. The division of Contingency Areas into segments is based on (1) internal drainage divides within the Contingency Area or (2) minor changes in drainage characteristics.

4.2 Containment Techniques and Procedures

This section discusses the construction and deployment of physical barriers to limit or prevent the flow and spread of an oil spill. Also included in this section is a discussion on using existing structures for oil spill containment. Included in the discussion of each containment technique are the procedures for implementing and using each technique, locations where they can be used, and the types of equipment required for their use. The following oil spill containment techniques are discussed:

- use of existing structures and features
- dams
- berms
- booms
- blocking drain systems
- interception barriers

Although each of the above techniques is discussed individually, it is likely that containment of a specific oil spill will require a combination of the techniques.

4.2.1 Use of Existing Structures and Features

The amount of damage incurred by the surrounding environment may be decreased by using existing structures and features where possible in oil spill containment operations, as well as the effort required to contain a spill. Before initiating containment techniques, potentially affected areas should be examined for existing structures or features that may be used to contain a spill. For example, oil flowing in an irrigation ditch could be more rapidly and more effortlessly contained by closing an existing irrigation gate instead of using some type of heavy equipment to construct a dam across the ditch. Examples of existing structures that could be used for oil containment are: irrigation control gates, bridge supports for securing booms, and irrigation ditches as barriers.

4.2.2 Dams

Dams can be constructed to contain an oil spill on land, rivers and streams, and canals and irrigation ditches. There are two types of dam construction appropriate for oil spill containment: the complete blocking of an actual or potential drainage course (a dam) and the blocking of oil flow while water is allowed to continue downslope (an underflow dam). Dams should be constructed only across drainage paths that have little or no water flow. Underflow dams can be used for perennially flowing drainages. An underflow dam consists of a structure placed across the top of a stream to allow water to flow underneath but retain the oil at the surface.

4.2.3 Berms

Berms are constructed to control flow by diversion or overflow. Diversion berms can be used to divert a spill from its natural flow direction to an area that will facilitate containment and cleanup operations. Overflow berms (weirs) are used for reducing water velocity by widening and deepening the channel of a body of water. Overflow berms can be used only on smaller streams or canals where flow velocity will permit the construction and maintenance of the berm.

4.2.4 Booms

Booms are used as an oil spill containment procedure on water.

Booming on Rivers, Streams, and Canals. A boom provides a floating barrier to an oil slick on a stream's surface and allows the water to flow underneath. Two methods of booming can be used on rivers, streams, and canals; containment booming and diversion booming. Containment booming involves deploying a boom across a body of water and anchoring or fixing the boom between two or more stationary points, thereby, preventing oil from flowing downstream of that point. Skimmers or vacuum trucks can then be used to remove the oil from the water at that point. Diversion booming involves fixing a boom to the bank at one end and angling it upstream toward the approaching oil slick forcing the oil to the bank or angling it away from the approaching slick forcing the oil away from the bank. Diversion booming deflects and concentrates the oil in the deflection direction and is employed when it is necessary to direct the oil onto the bank or into a containment pit or area, or to prevent the spill from contacting the river bank by diverting the spill back to the main river channel, or when the water current is too fast for containment booming.

Booming on Lakes and Reservoirs. Containment of an oil spill on open water is best achieved by deploying a boom in a U-shape in advance of the approaching slick. If a spill has broken into streamers, they can be "chased" with a self-propelled skimmer or contained by encircling with boom(s). Skimmers, working within booms, should be used to remove the oil layer from the water surface. When skimming becomes inefficient - after most of the spill has been removed or for small spills - sorbent pads or sorbent rolls may be used. Sorbents should only be used with contained spills.

4.2.5 Blocking Drain Systems

It may be necessary to block man-made drainage systems such as street storm drains, culverts, and their outfalls. There are several ways to block these drainage systems. The most effective is to block them with earth materials - to pile dirt, sand, or a similar material over the upstream end of the culvert or drain. Sandbags or sheets cf plywood can be placed over the upstream end to stop or retard flow. Culverts that contain flowing water may require the installation of an underflow device or a pump or siphon to remove trapped water, depending upon the volume of water being passed and the amount of storage upstream from the culvert. To contain oil at outfalls, a sandbag or earth dam in a horseshoe-shape can be built around the outfall as it discharges.

4.2.6 Interception Barriers

Interception barriers consist of trenches, pumps, and sheets of metal or plywood that intercept surface and subsurface flow of spilled oil. These techniques are generally only applicable to the interception of subsurface flow when the flow of oil is within 6 feet of the ground surface. When trying to intercept subsurface oil flow, the direction of subsurface flow must be determined before a barrier is installed. Trenches, pumps, and sheet barriers may be used separately or together.

Trenches can be excavated to prevent the movement of both surface and subsurface oil migration. The trench should be excavated at right angles to the oil flow and somewhat longer than the width of the leading edge of the spill.

Sheets of overlapping corrugated steel or heavy plywood can be used where subsurface oil flow is near the surface and/or where the ground will allow them to be driven deep enough to intercept the flow of oil.

A sump can confine a spill by providing storage for spilled oil. A sump can be an excavated pit or a natural depression.

4.3 Oil Cleanup Techniques

The cleanup of the oil-contaminated areas should begin immediately after emergency containment actions have been completed and the proper means of cleanup have been established. The procedures will depend upon the location of the spill, the volume of oil spilled, and the environmental characteristics of the areas affected. The following paragraphs outline procedures for the removal of oil from water, bankside, and land areas. The Cleanup and Restoration Manager is responsible for the cleanup operations. Information on the disposal of oil contaminated wastes is given in Section 4.5.

Basic cleanup techniques, when used singly or in combination, can facilitate the removal of spilled oil and oil-contaminated materials. Cleanup techniques discussed are:

- Heavy equipment
- Pressurized methods
- Skimmers
- Vacuum trucks and diaphram pumps
- Burning
- Sorbents
- Manual methods
- Vegetation cutting and removal
- Water flooding (contaminated groundwater)
- Pumping (contaminated groundwater)
- Soil removal

4.3.1 Heavy Equipment

Motorized graders and paddle-wheel scrapers can be used to remove oil-contaminated material from flood plains and open land. Motorized graders cut and remove the contaminated layer and put it into windrows.

Bulldozers and front-end loaders can be used to remove oil-coated gravels from flood plains. Flood plain gravels, because of their high permeability, can be affected to a greater depth than sands. Bulldozers can excavate the contaminated gravels, which can be picked up by front-end loaders and placed into dump trucks.

The same basic technique can be applied to cleaning up a spill along a highway or road. Contaminated materials in the borrow ditch can be removed with a motorized grader. If the ditch is somewhat inaccessible or narrow, a backhoe or grade-all can be parked on the road surface and pull the material from the ditch. Front-end loaders could place the removed material into dump trucks to be hauled to a disposal area.

4.3.2 Pressurized Equipment

There are four types of pressurized systems that are useful in removing oil from rocks, concrete-lined channels, and man-made structures: hydroblasting, air and sand blasting, steam cleaning, and low-pressure water flooding. When utilizing these procedures to clean rocks, the Environmental Coordinator will be consulted to determine if these techniques are warranted, since these processes would likely remove all life forms on the surface being cleaned, destroying those which survived the spill.

Hydroblasting. Hydroblasting utilizes a high-pressure water jet that can be used to remove oil adhering to almost any surface. The hydroblast jet drives the oil off the surface; the oil then adheres to another surface or forms a slick on top of the water. Recontamination is best prevented by letting the water and oil form a pool or reenter the water. It is then skimmed off by a skimmer and pumped to storage.

Air and Sand Blasting. Air blasting and sand blasting operate under the same principles as hydroblasting. Air blasting utilizes a high-pressure air jet; sand blasting, a high-pressure air and sand jet.

Steam Cleaning. Steam cleaning equipment uses a high-pressure steam jet and can be used to remove oil adhering to almost any surface. In addition to the high-pressure steam jet's cleaning ability, the heat of the steam from the cleaner raises the temperature of the adhered oil, thereby lowering its viscosity and allowing it to flow off a surface.

Low-Pressure Water Flushing. Low-pressure water flushing is an effective technique in removing oil from marshes, ponds, and other slow-moving bodies of water. Although flushing may be conducted from land, boat operations are preferable, as they result in less physical disruption of the land area. Flushing systems may be assembled in any size, although small portable units are generally most useful. Each portable system is composed of a water pump, inlet hose (suction line), and outlet hose (spray line). Flushing should proceed from the upstream (water or wind) point of contamination and work downstream. Once driven into the water, the oil can be herded toward a collecting point with water jets. Attempts should be made to utilize bankside characteristics and work with currents and winds.

4.3.3 Skimmers

Skimmers are the simplest and most effective tools for removing oil from the surface of water bodies. Skimmers are normally used in conjunction with dams, berms, and booms as discussed in Section 4.2.

There are two basic types of small floating skimmers: those with onboard pumps, and those with remote pumps. Those with onboard pumps are powered, whereas those with remote pumps can be either powered or hand-operated.

4.3.4 Vacuum Trucks and Diaphram Pumps

Vacuum trucks and diaphram pumps are capable of pumping large volumes of oil rapidly and are essential in cleaning up a large spill. Vacuum trucks can be positioned where they can directly remove oil from behind a boom. They can pump the oil into a containment pit, another truck, or into their own storage tanks. Diaphram pumps can be useful in cleaning up large terrestrial spills. The discharge hose can lead into a truck, containment pit, or bladder tank.

4.3.5 Burning

Determining the feasibility of burning is best accomplished by test ignition of oiled vegetation at an area away from the actual site. Relatively high temperatures may be required for first ignition. Once ignited, however, the fire must be self-sustaining for effective use. Once "burnability" has been demonstrated, burning permits must be obtained from appropriate regulatory agencies. Obvious factors associated with granting of permits include public safety, wildlife hazard, and air pollution. A burn plan should be prepared as part of the permit process. In many areas, game management personnel will be available to provide expertise on burning. Burning should be restricted to small section isolated by water or by earth barriers.

4.3.6 Sorbents

A sorbent is any material that absorbs oil, or a substance to which oil adheres. In general, sorbents are not recommended for use in the initial phases of oil spill cleanup or on uncontained spills on water.

Two methods of sorbent application can be used: the broadcast and recovery of loose sorbents and the use of roll, pad, and other sorbents. Use of sorbents includes the application of material, its recovery, and its disposal. As use of sorbents involves additional manpower and increases disposal requirements, its use should be carefully considered. Squares, strips, and rolls of sorbent material can be used in small contained areas to pick up small quantities of oil that are difficult to remove with mechanical equipment.

Sorbent booms are designed to serve a dual function, i.e., absorbing oil and acting as a boom. However, with the present design of such booms there exist several operational problems. Sorbent booms, however, can be used effectively to protect sheltered water areas from becoming oil-contaminated. They are also effective when deployed around skimmers to pick up oil that eludes the skimmer.

Loose-type sorbent materials are not recommended for use on oil spills occurring in water, but in assisting in the cleanup of oil from land areas where pools of oil have formed in depressions, etc.

4.3.7 Manual Methods

The final stages of cleanup for any spill will probably involve the hand-cleaning of many surfaces. Areas that are inaccessible to equipment, are environmentally sensitive, or present only small amounts of surface to be cleaned should be cleaned by hand. Hand scrapers and wire brushes can be used to remove oil from rocks, concrete-lined channels, and man-made structures.

4.3.8 Vegetation Cutting and Removal

Contaminated vegetation can be removed by two methods, depending on factors such as trafficability, slope, and if the spill is on water, water depth and current. The two methods are hand cutting and mechanical cutting. When hand cutting, personnel use shears, power brush-cutters, sickles, or other devices to cut down the vegetation. Mechanical cutting can employ a variety of commercial aquatic weed-cutters or agricultural harvesting equipment.

4.3.9 Water Flooding

Water flooding is a means of floating subsurface oil to the surface where it can be cleaned up with sorbents, skimmers, and booms. In areas where a spill may migrate into the soil layers, some of the spill may be forced to the surface by water flooding. Water can be pumped onto the area until the groundwater table is raised enough to force the oil to the surface. Then the oil can be removed with booms, skimmers, and sorbents. However, it is likely that the water will have to be forced into the ground by pumping it through a series of holes drilled into the groundwater table.

4.3.10 Pumping

Generally, drilling and pumping techniques will have to be employed where the oil has migrated to a depth of more than 6 feet. Drilling and subsequent pumping of contaminated groundwater require some knowledge of the subsurface hydrology of the affected area.

4.3.11 Soil Removal

In cases where toxic and persistent oils have penetrated the substrate, soil excavation may be the only means for removing the contamination and preparing the area for restoration.

No standard instructions can be give regarding soil removal. This is a costly, environmentally damaging procedure and must be limited to the smallest possible area. Careful preliminary surveys will be useful in controlling the area to be treated. Silt curtains and earth barriers may be useful in controlling siltation during the removal process.

Any area undergoing substrate removal will require restoration. A preliminary step prior to attempting restoration procedures involves returning the substrate surface to its original elevation. Impoundment of hydraulic-dredging slurry provides the only economically reasonable method of replacing large volumes of soil.

4.4 Restoration of Spill-Affected Areas

Very little work has been done to determine effective methods of restoring arid or semiarid lands that have been contaminated with oil. Consequently, the following discussion is based largely on fundamental biological relationships instead of actual experimental evidence. For this reason, this plan should be used as a guideline to be expanded on as further restoration techniques are developed.

4.5 Disposal

The disposal of recovered oil, oil and water mixtures, and oil-contaminated materials can pose initial and long-range problems. The methods of oil-contaminated water and material disposal will require the approval of the appropriate Federal and state agencies; therefore, before disposing of oil-contaminated substances, Federal and state water and air quality agencies must be consulted.

5.0 OIL SPILL EQUIPMENT

5.1 List of Operators Equipment

Oil spill containment and cleanup equipment and supplies listed below will be stored at the various Regional Response Centers for immediate deployment and use in the event of an oil spill.

The following is a list of spill equipment which will be stored and maintained at each Regional Response Center for immediate use by trained operating personnel. The actual equipment list will be forwarded to the EPA, State Lands Commission, the County of Santa Barbara, _______, _______, and _______ prior to project commencement.

5.2 Cooperatives Equipment List

If an oil spill occurs which is beyond the capabilities of operator personnel and equipment, assistance will be requested from ____________. _______________ Equipment Inventory:

5.3 Contractors Equipment List

Listed below are the equipment inventories of the primary oil spill cleanup contractors that may be contacted to provide additional spill response equipment or services as required by the circumstances of the spill.

5.4 Response Time

The response time for the deployment of oil spill containment and cleanup equipment will vary considerably depending on storage location, staging area, and location of the spill. Response times from the various storage locations to the primary staging areas are given in Table 5-1 (Response Times From Equipment Storage Areas To Staging Areas, to be provided by applicants when final design is complete).

6.0 PREDICTION AND PREVENTION OF POTENTIAL SPILLS

6.1 Project Components and Prediction

The project description is provided in Chapter 2.0 of the EIR. (This section will outline primary sources of potential spills, by component, and the magnitudes involved).

6.2 Prevention Measures

(This section will list, by component, the design features for prevention and or reducing the magnitude of spills).

7.0 REPORTS AND DOCUMENTATION

7.1 Introduction

Following any spill which requires activation of the Oil Spill Task Force, a comprehensive report of the incident will be compiled by the Coordinator. This report is used to prepare subsequent reports required by government agencies as well as to modify and improve the existing contingency plan.

Documentation of an oil spill provides not only an historical account covering the entire period from pre-spill through cleanup actions to final post-spill assessment, but also serves as a legal instrument. Documentation relies heavily upon the detection and assessment functions and together with these provides the necessary data on the extent of the spill and what control actions must be undertaken.

7.2 Types of Documentation

To insure that all pertinent data and information are available for the incident report, documentation will commence immediately upon notification of an oil spill and will continue until termination of all operations. The following subsections describe the various documentation types.

7.2.1 Photographic Surveys

Photographic coverage of all phases of the oil spill will commence as soon as possible and should provide representative coverage of the incident until termination of all operations.

7.2.2 Sampling Surveys

Product samples should be taken at routine intervals from the area of the spill and from slicks or patches that have moved some distance from the spill site if the product reaches a body of water. Each sample should be clearly tagged with time, date, location and name of sampler.

7.2.3 Biological Monitoring

When an oil spill occurs, the effects of oil contamination and cleanup operations on biological communities will be documented by sampling the affected habitats. Noncontaminated areas that are biologically and physically similar to the contaminated one will be sampled simultaneously to serve as control (baseline) samples.

7.2.4 Climatological Reports

Climatological data for the affected area will be collected during the incident and will include:

- Temperature
- Precipitation
- Humidity
- Wind direction and speed

7.2.5 Accident Report

Various accident reports may be filed to satisfy Federal, state, and local agencies.

7.2.6 Cost Information

A complete record of all costs incurred during the spill will be maintained, including costs of:

- Equipment
- Contractual support, including number of hours worked

- Supplies
- Property damage claims
- Repair
- Support services (such as photography, sample analysis, transportation and food)
- Legal services

7.2.7 Record of Agency Contracts

The Documentation Supervisor will, with the Government Liaison, Environmental and Public Relations Coordinators, record all contacts with the directives from government agencies and record all permits obtained for specific operations that are subject to regulations, such as disposal of oily materials, use of government-owned equipment, access to land, and use of chemical agents. Field and support personnel should begin as soon as possible to collect and store data. A record should be kept of every contact, written or verbal, and government personnel. All data should be written in a bound notebook, from which pages cannot be removed without leaving evidence.

7.2.8 Company Report

A final, comprehensive report should be prepared for the operators internal use. It should be written in a narrative form, including all appropriate information listed below:

8.0 PUBLIC AND GOVERNMENT RELATIONS

8.1 Public Relations

In the event of an oil spill, the Oil Spill Coordinator will act as official spokesperson to the news media. Depending on the circumstances, the official spokesperson may authorize the Public Relations Coordinator to answer inquires and to prepare information releases.

8.2 Government Relations

If criminal action is anticipated by an agency, the investigating government representative may advise an employee of his/her constitutional rights. The employee may be asked to voluntarily sign a waiver of those constitutional rights and discuss details of the spill. Unless the statement has been cleared with the operators legal staff, the employee is advised to decline to sign such waiver.

9.0 FIRE PROTECTION PLAN

9.1 Introduction

The safety of the personnel and physical environment at the facility was a prime consideration in the facility's design and operation. The facility has been designed, constructed, and operated to comply with the State of California Fire Marshall's Standards, Title 19 - California Administrative Code and the Santa Barbara County Petroleum Ordinance No. 2795, ________, ________, and ________.

The following sections describe the fire prevention measures incorporated into the proposed facility design and operation.

9.2 Fire Protection System

9.2.1 Foam System

There will be one fixed and one mobile foam system for the tank farm facility. Each system will have sufficient foam storage to be able to supply 2,000-3,000 gpm of foam for approximately 60 minutes. A foam such as 3 Percent Light Water Aqueous Film-Forming Foam (AFFF) will be used.

Each tank in the tank farm will be equipped with a foam system using dedicated piping. The piping will run from the tanks to a manifold system located outside the diked area near a hydrant. In the event of a spill or fire, the mobile foam system will be brought to the area of concern and connected to the water hydrant and manifold. The mobile system will then mix the foam and water and pump it into the foam system.

The mobile foam system will consist of a truck containing foam storage, pumps, a foam proportioning system, and the necessary hoses for connections to the water system and manifold.

Fixed roof storage tanks with internal floating pans make the facilities even less susceptible to fire by preventing vapor emissions.

9.2.2 Equipment

There will be adequate fire extinguishers, fire blankets, fire suits, and hose carts located at strategic locations at the pipeline pump stations.

Fire will not adversely affect operation of the pipeline unless damage occurs at pump stations, above ground valves, power lines, or communication lines. Each pump station will consist of 2 acres of cleared and fenced land which will provide some fire protection. In addition, fire sensing devices are located at each pump station along with hand-held fire extinguishers. No water source is needed. All maintenance and personnel vehicles are equipped with 2-way radios for fast communication so that fire-fighting agencies can be promptly notified if necessary.

9.3 Control and Monitoring

Critical operating parameters are monitored continuously and alarms will be triggered whenever abnormal conditions occur. The control, monitoring, and data acquisition systems at the facilities encompass:

- Tank gaging
- Tank farm control center
- Pipeline supervisory control

- Leak detection
- Emergency shutdown
- Support systems operation
- Fire Protection

This set of functional operations will be carried out by a set of control centers and control rooms located at points proximate to the primary functions being controlled. The following are described in this section.

9.3.1 Tank Farm Control Center

The tank farm control center controls all of the pumps associated with movement of crude oil into and out of the storage tanks. These pumps include the tanker loading pumps, the pipeline booster and discharge pumps. Instrumentation in the tank farm control center includes:

- level of all tanks
- pumping rates in all lines
- oil temperature in tanks
- pump suction and discharge pressures
- on/off condition of each pump
- open/closed positions of all valves.

Supervisory control over the crude oil pipeline is exercised from the tank farm control center. From this station, control can be exercised over the entire pipeline operation via microwave or leased line feedback from the central plant and the intermediate boosting stations. The supervisory control and data acquisition system operation would encompass overall pipeline operations control, automatic custody transfer inputs, and pipeline leak detection, alarming, and shutdown.

This pipeline supervisory control system outline will be as follows:

<u>Operations</u>

- CRT Displays and Reports
- Operations Status Summary
- Supervisory Control and Data Acquisition (SCADA) Variables and Set Points
- Daily Operations Summary
- Meter Data Summary
- Alarm Summary
- Automatic Shutdown
- Automatic Paging

<u>Automatic Custody Transfer</u>

- Recordings
- Measurement Integrity

Pipeline Leak Detection

- Metering
- Discrimination
- Processing
- Alarming
- Control

A CRT keyboard allows the operator to control, program, and monitor the operations. An annunciator is provided for important alarm points. A printer will log important data and alarm points.

9.3.2 Security and Reliability

The reliability of the control system will center around a fault-tolerant system design, redundant field sensors for critical items, uninterruptable power supplies, and special separation of field wiring in conduit.

The operator interface with the CRT, annunciator, and data and alarm logger will also provide a large degree of security.

9.4 Fire Fighting Training

Supervisory personnel currently attend a 1-week training session on the extinguishment of fires, with special emphasis being given to extinguishment of oil fires. The Person-in-Charge and other operating personnel are then given "on-the-job" training in the operation of firefighting equipment and extinguishment methods for various situations and types of fires. Additionally, operations personnel are periodically given "hands on" training in the use of dry powder portable fire extinguishers.

9.5 Fire Drills

Unannounced fire drills shall be conducted by the Area Foreman not less than twice per year. An evaluation of each fire drill shall be forwarded to the Operations Manager within 10 days after the fire drill and a copy retained on file at the facilities for 1 year.

10.0 SUMMARY OF SENSITIVE AREAS

The combined Celeron/All American and Getty pipelines would cross a variety of ecosystems between the California coast and Texas. Along the route numerous resources are considered at risk from potential oil spill. Table 10-1 summarizes areas along the pipeline route identified by resource specialists as being sensitive to an oil spill event. Based on the locations of these sensitive areas, maximum spill size volumes were estimated for each area. Factors such as elevation, location of check valves, and system shut-off response time were considered, if available, to calculate spill volumes. An automatic shutdown system would generally reduce the amount of the spill by two to three times.

TABLE 10-1

ESTIMATES OF POTENTIAL SPILL VOLUMES AT SENSITIVE OR POTENTIALLY HAZARDOUS AREAS ALONG THE PIPELINE ROUTE

	Celeron/All American (Automatic Shutdown)		Getty (Automatic Shutdown)	
	(bbl)	(gal)	(bbl)	(gal)
Refugio Creek	1,753	73,626	NA[1]	NA
Gaviota Creek	1,753	73,626	1,162	48,804
South Branch Santa Ynez Fault[1]	6,157	258,594	4,934	207,228
Santa Ynez River	3,244	136,248	2,240	94,080
Sisquoc River	2,620	110,040	3,120	131,040
La Brea Creek	1,753	73,626	2,023	84,966
Cuyama River	2,192	92,064	2,120	89,040
San Luis Obispo/Kern County Line[2]	8,370	351,540	3,160	132,720
San Andreas Fault	4,635	194,670	2,200	92,400
Garlock Fault[2]	5,465	229,530	NA	NA
Mojave River	3,945	165,690	NA	NA
Colorado River	3,506	147,252	NA	NA
Gila River	4,383	184,086	NA	NA
Wild Cat Canyon Creek	1,981	83,202	NA	NA
Bass Canyon Creek	3,068	128,856	NA	NA
Rio Grande River	2,629	110,418	NA	NA
Pecos River	4,821	202,482	NA	NA

Source: Celeron/All American, and Getty

[1]Not Applicable.

[2]No valves at the crossing location.

TABLE 10-2

SENSITIVE AREAS ALONG THE PIPELINE ROUTE WHERE OIL SPILLS WOULD HAVE SIGNIFICANT IMPACTS

Location	Resource: EIR/EIS Cross Reference	Surface Hydrology (Sec. 4.2.4)	Groundwater Hydrology (Sec. 4.2.5)	Aquatic Resources (Sec. 4.2.6)	Terrestrial Biology (Sec. 4.2.7)
Refugio Creek					
Gaviota Creek					
South Branch Santa Ynez Fault					
Santa Ynez River		X	X		
Sisquoc River		X			
LaBrea Creek		X			
Cuyama River		X			
San Luis Obispo/ Kern County Line					X
San Andreas Fault					
Garlock Fault					
Mojave River			X		
Colorado River				X	
Gila River				X	
Wild Cat Canyon Creek					
Bass Canyon Creek				X	
Rio Grande River			X	X	
Pecos River				X	

Sources: Getty and Celeron/All American.

Potential impacts of spills at these sensitive areas are addressed in the individual resource sections of the Draft EIR/EIS. Table 10-2 indicates which resources are at risk and which sections of the Draft EIR/EIS address specific impacts of potential oil spills.

Once final pipeline design is completed, the operator(s) will develop specific oil spill contingency and countermeasure plans for each of the sensitive areas identified.

11.0 OIL SPILL PREVENTION

The following design features were proposed by Getty and Celeron/All American in their applications to prevent the adverse impacts of an oil spill:

- The pipelines would be equipped with a cathodic protection system to reduce or prevent pipeline corrosion. Corrosion protection test stations would be installed at least every 10 miles to test the performance of the cathodic protection system.

- A Supervisory Control and Data Acquisition (SCADA) system is proposed by Getty for 24-hour remote alarm, status, and control functions. The SCADA system would be operated from a master station located at Gaviota, California. Leak detection would occur in the SCADA system based on inflow-outflow data. A significant deviation without an operational cause would initiate pipeline shutdown, closing block valves, and patrolling in search of a possible leak. Celeron/All American propose a similar system that would be operated from Midland, Texas.

- Block valves would be installed in the pipeline to allow selective isolation of various segments of the line for maintenance, modification, and emergency shutdown (especially at stream crossings). There would be 13 block valves for Getty, 14 block valves for Celeron, and 60 block valves for All American. Block valve status and control is performed by the operator at the master station using the SCADA system. Getty proposes an automatic shutdown system, while the Celeron/All American system is a combination of manual and automatic. Celeron/All American would place automatic block valves at 12 sensitive resource locations.

- Each weld on the pipeline would be radiographed by an independent contractor. The radiographs would be developed and evaluated at the site by a certified technician and each weld passed or rejected and repaired under guidelines set forth by the American Petroleum Institute.

- After a pipeline segment is completed, it would be filled with water and hydrostatically tested to the appropriate DOT standards. The pressure during the hydrostatic test would be

1.25 times the pipeline operating design pressure. The hydrostatic tests are designed to show that the pipe, fittings, and welds would maintain without leakage under pressure.

- All major pump station equipment would be monitored by on-site sensors. If a mechanical or electrical fault occurred, the defective equipment would be automatically stopped and an alarm sent to the dispatcher. The dispatcher could not restart the defective equipment until repairs were made and lockout mechanism reset locally.

- The Getty pipeline would be overflown by a skilled pipeline patrol pilot twice weekly to check for signs of construction that might impact the pipeline, changes in topography that could affect the pipeline, and oil stains that may indicate a slow oil leak.

- At least once each year, pipe-to-soil potential readings would be made and analyzed to determine the effectiveness of the cathodic protection system.

- Access roads to the pipeline and pump stations would be maintained to provide access for maintenance personnel at all times.

- Pipeline block valves for Getty would be fenced with chain link fences and locked gates. The valves would also be independently locked to prevent unauthorized operation for both applicants.

- The pipeline communications system would ensure the transmission of information required for the safe operation and maintenance of the pipeline. The Getty system would be comprised of a telecommunications cable and necessary facilities buried adjacent to the pipeline in the designated ROW. The system would provide transmission of supervisory control and surveillance data and voice communications. Celeron/All American would use a telephone or microwave system.

- Maintenance centers for Celeron/All American would be located near Bakersfield, California; Casa Grande, Arizona; Lordsburg, New Mexico; and Midland, Texas to minimize travel distances and response times to make emergency repairs.

- The pipelines would be marked according to DOT specifications at fences, road crossings, and sufficient other locations to identify its route. Markers would have a collect telephone number on them so anyone who observes a pipeline problem could call the company.

- At stream crossings, the pipelines would be buried at a depth of 4 feet below probable scour depth of a 24-hour 100-year flood.

- At the Cadiz storage area, a dike 6 feet high would be constructed for 125 percent containment of the tanks.

- Automatic overflow alarms would be installed in the Cadiz storage tank gauging device. The tanks would comply with Federal performance standards for liquid petroleum storage vessels and the requirements of the San Bernardino Air Quality Management Office.

- At the Cadiz storage tanks, collection sumps and pumps would be installed for areas around pumps, scraper traps, and meters where oil contamination could occur.

- An oil spill contingency plan would provide information on oil spill response techniques and procedures to be followed. This plan must be completed within six months after the project begins operation and certified by a registered professional engineer. The plan would be implemented within 12 months after the project begins operation. The SPCC plan should be maintained on file at the project office. The applicant would provide for an on-site inspection by EPA to verify compliance with the plan.

- Inspection pigs (scrapers) would be used to measure the severity of corrosion and to inspect pipeline defects. If pipeline defects are detected, the pipeline internals would be cleaned and recoated or the damaged segment would be removed and replaced.

The following mitigation measures were either not included among those proposed by Getty and Celeron/All American or were not emphasized.

- Storage tanks should be subjected to regular pressure testing (if they are partially buried metallic tanks).

- The pipeline should be cleaned at regular intervals.

- Containment dikes should be built around surge relief tanks to contain any potential oil spill.

- Local governments should help identify strategic points for storage of oil spill emergency equipment. Equipment should be within two hours of any point on the line.

APPENDIX I

FIRE PROTECTION PLAN

APPENDIX I

FIRE PROTECTION PLAN

Introduction

The proposed pipeline projects have been designed to operate unmanned except for daily inspections of pump stations and 24-hour per day control room coverage. The pipelines would be designed, constructed, and operated in accordance with all applicable Federal, state, and industry codes and standards. Fire protection services for the pipeline facilities would be provided by the closest local fire department to the fire or emergency. Some fire protection equipment would be included in the pipeline facilities as described in the following section of this plan.

Fire Protection System

The proposed pipeline facilities would be equipped with the following systems:

- smoke detectors
- fire sensors
- fire extinguishers

Smoke Detectors

Smoke detectors would be installed inside the electrical power buildings at all of the pump stations. Should the detectors become actuated, an alarm would be sounded in the control room and the pump station shut-down system would be automatically triggered causing the following to occur:

- oil pipeline pump station by-pass valves would be actuated and the pump station would be shut down, and

- the fuel gas line to the heaters at those pump stations which include heaters would be closed.

Fire Sensors

Fire-eye type flame sensors would be installed at strategic locations around the pump stations. The sensors would be looking at those areas which could be the source of a fire. Should a fire be sensed, an alarm would be sounded in the control room and the pump station shutdown system would be automatically triggered causing the following to occur:

- oil pipeline pump station by-pass valves would be actuated and the pump station would be shut down, and

- the fuel gas line to the heaters at those All American pump stations which include heaters would be closed.

Upon receiving the fire alarm in the control room the dispatcher would institute the fire/emergency response procedures presented late in this plan.

Fire Extinguishers

There would be adequate fire extinguishers located at strategic locations around the pump stations to provide a means of extinguishing very small fires in the event personnel are at the station when the fire breaks out. These extinguishers would be inspected and maintained in accordance with applicable fire codes.

Control and Monitoring

Critical operating parameters would be monitored continuously and alarms would be triggered whenever abnormal conditions occur. The control systems either directly or indirectly related to fire protection are listed below:

- pipeline supervisory control
- leak detection
- emergency shutdown
- fire protection
- tank gauging (All American Cadiz tank farm and Gaviota Marine Terminal tank farm)

These operations are all carried out at the central control rooms in Bakersfield, California for Celeron/All American and at the Gaviota Marine Terminal for Getty.

Control Center

From the control center, the entire pipeline operations would be controlled and monitored via a fiber optics system laid with the pipeline and/or leased telephone lines from the pump stations for Celeron/All American and via microwave transmission for Getty. A CRT keyboard would allow the dispatcher to control, program, and monitor all of the operations.

Security and Reliability

Operational security (i.e., assurance of proper operation) is provided by the operator interface with the CRT, annunciator, and data alarm logger. The reliability of the control system would center around a fault-tolerant system design, totally redundant computers and peripheral equipment, an uninterruptible power supply, and remote terminal units (RTU) equipped with stand-by power.

Fire Fighting Training

Fire fighting training would consist of classroom training on the extinguishment of fires with emphasis on oil fires. Hands-on-training would also be given in the use of fire extinguishers and fire fighting equipment. Management personnel would attend oil fire fighting school at either the Western Oil and Gas Association school in Reno, Nevada or the Texas A&M school in College Station (Bryan), Texas. Historically, the training received at oil fire fighting schools has been a key element in the operation of a safe petroleum facility. Coordination procedures would also be developed, per state law, with the local fire departments and the pipeline companies. These procedures would become part of the fire protection plan once they are developed.

Fire Drills

Fire drills would be conducted not less than twice per year to insure that mobilization plans and fire/emergency response procedures are adequate. These drills would insure that all parties involved remain familiar with the procedures required to handle an oil fire. This is particularly important for those local fire departments which have no other dealings with this type of emergency.

Fire/Emergency Response Procedures

In the event of a fire at a pump station, the following procedures would be followed.

a) Call the local fire department in the area of the pump station.

b) Call the local law enforcement department in the area of the pump station.

c) Confirm that the pump station pumps are off and that the block valves (oil and gas) are closed by checking the computer indicators.

d) Call the following persons in the order listed until one is reached and the situation is reported.

Celeron/All American	Getty
1) Area Superintendent	1) Site Foreman
2) Mechanical Equipment Foreman	2) Terminal Supervisor
3) Electrical Technician Foreman	3) Area Manager
4) Gang Foreman	4) Operations Manager

The person contacted would then assume responsibility for handling the situation and would dispatch company personnel to the scene.

e) After completing the above, the dispatcher would report the situation to the General Manager of the pipeline.

APPENDIX J

ADDITIONAL AGENCY RIGHT-OF-WAY STIPULATIONS

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ADDITIONAL AGENCY RIGHT-OF-WAY STIPULATIONS

In addition to the mitigation measures presented in Chapter 4, various agencies will require stipulations as part of their right-of-way (ROW) grants. While these stipulations are not designed to mitigate specific significant impacts, they will function to reduce the overall impacts of the project. Listed below are the stipulations that have been identified by the affected agencies at the time the EIR/EIS was published. Additional stipulations will be developed as the environmental review process progresses, and these will be incorporated into the final ROW grants.

General

- Compaction of back-filled material will be required on all refuge lands. (FWS).

- Pipe depth will be a minimum of 4 ft below the surface on the Kofa National Wildlife Refuge (NWR) and constructed so that future use of the area by heavy equipment will not require further modification of the landscape. (FWS).

Aquatic Biology

- Staging areas for stream crossing equipment will be located outside of the stream's riparian zone to minimize the amount of sediment entering streams and to reduce disturbance to riparian vegetation. A maximum construction ROW of 50 ft will be used in riparian areas to reduce disturbance. (Forest Service, BLM, and FWS).

- Stream bank and bottom protection measures including rip-rapping, upland storage of excavated riverbed materials, importing clean backfill, natural backfilling, and revegetation will be evaluated by the Authorized Officer and implemented on a case-by-case basis. These techniques will reduce the construction related sediment load to the stream and minimize alterations of important aquatic habitats. (Forest Service, BLM, and FWS).

- Construction activities will be timed to avoid spawning periods of important fish species (Appendix B, Table B-2). Construction of stream crossings during low flow will minimize habitat degradation by reducing the amount of suspended solids and turbidity. Avoidance of critical fish spawning periods will eliminate potential impacts to eggs and juveniles, which are considered the most sensitive life stages. (Forest Service, BLM, and FWS).

Terrestrial Biology

- If possible, no sensitive plants will be removed or affected by the ROW on the Kofa NWR. (FWS).

  Such plants will be fully protected and avoided during construction; sensitive plants will be transplanted only if it is impossible to avoid them. (FWS).

- No desert tortoise mortalities will be accepted due to pipeline construction or operation on the Kofa NWR. (FWS).

- Surface disturbance will be kept to an absolute minimum on the Kofa NWR. All terrain will be restored to original grade after construction. Unnecessary blading of desert pavement will not be performed. (FWS).

- Harrowing or discing will be used along the disturbed areas of the Mojave Desert. Revegetation will not be attempted because of extremely low levels of precipitation. (BLM).

- Federal, state, and county laws and regulations pertaining to sensitive vegetation and wildlife (i.e., T&E species, game species) will be posted in conspicuous places at the job site and included in pipeline contractor's contract. (BLM).

Soils

- Construction activities will avoid or minimize disturbances to sensitive soil units as determined by the authorized officer. Sensitive soils are characterized by major potential problems associated with erosion control and revegetation (i.e., steep slopes, slump-prone areas, shallow soils, highly saline-alkaline soils, sand dunes). (BLM and Forest Service).

- Construction activities will not occur on fragile soils during periods of high or saturated soils moisture conditions. (BLM and Forest Service).

- Vehicle travel routes on the Kofa NWR will be watered down during construction to prevent movement of soil by vehicles, wind, etc. All disturbed areas will be restored to original grade with rocks replaced in a natural-appearing way. Improvements will be made to minimize soil erosion. (FWS).

- Construction activities will not occur from March through May in the Mojave Desert in order to minimize wind erosion. (BLM).

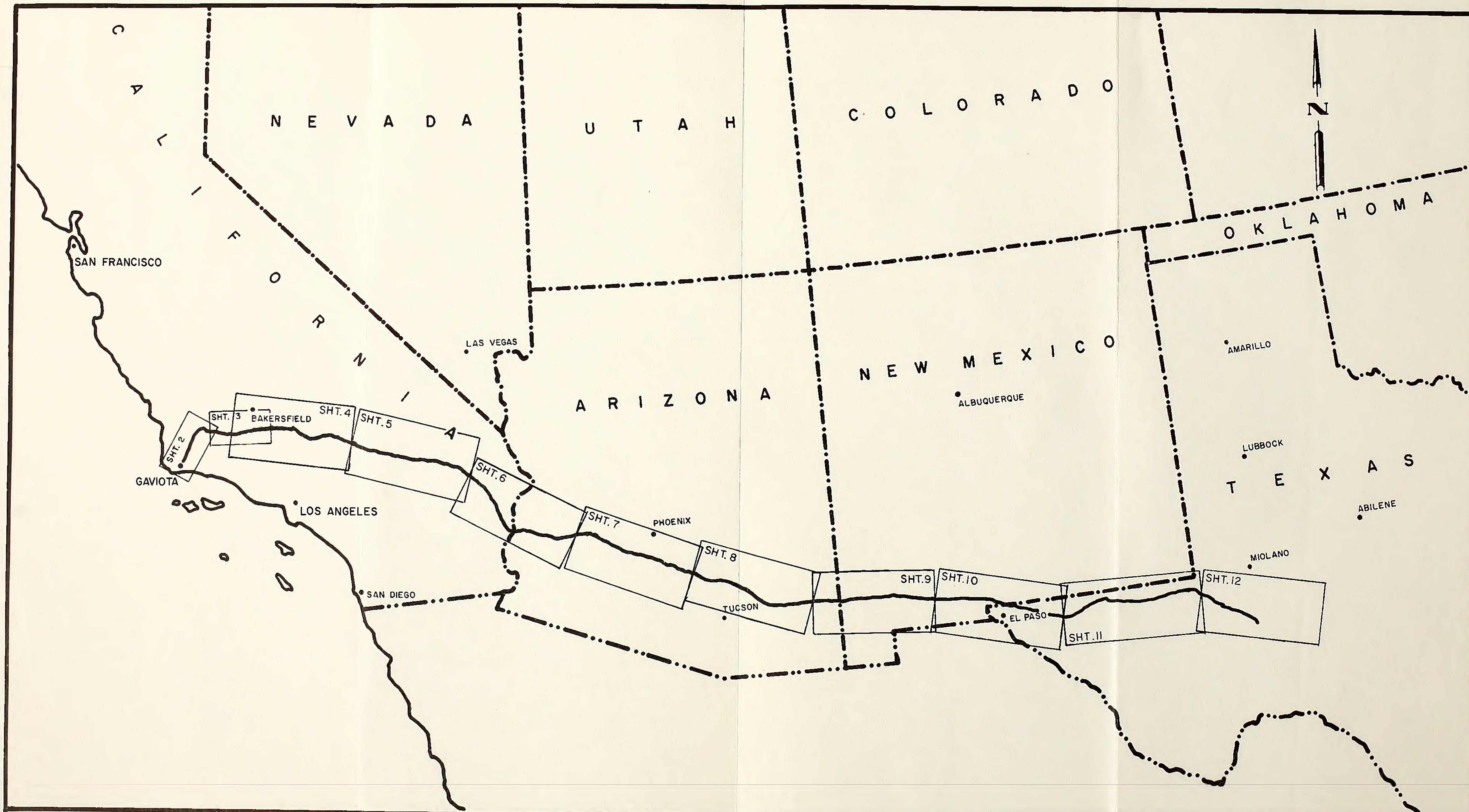
Land Use and Recreation

- The disturbed area of the Pacific Crest National Scenic Trail will be reconstructed following construction and rehabilitation of the pipeline ROW. (BLM).

System Safety and Reliability

- At the Cadiz tank farm, an automated, foam solution, fire extinguisher system for the seal area of each tank will be installed. The system should provide sufficient foam (about 310 gallons) and water (about 10,000 gallons) to extinguish a seal fire on one tank. (California SLC).

- At the Cadiz tank farm, a redundant sensor and control system to prevent overfilling of the oil tanks will be installed. Overfilling is a primary contributor to tank fires. (California SLC).



MAP 1-2

CELERON/ALL AMERICAN AND GETTY PROPOSALS AND ALTERNATIVE PIPELINE ROUTES

SHEET 1 OF 12

SHEET 2

Code[1]	Impact	Location	Description
A1	Oil spill effect on special status and recreational fish	Refugio Creek	Rainbow trout (recreational species), three-spine stickleback (coastal native species)
A2	Oil spill effect on special status and recreational fish	Gaviota Creek	Rainbow trout (recreational species), prickly sculpin (coastal native species), tidewater goby (candidate for federal listing as endangered)
G1	Surface fault rupture	Gaviota Gorge	South Branch Santa Ynez fault; evidence of offset during or just preceding Holocene time
G2	Landsliding	Cañada de Las Cruces	Old slump-block
G3	Landsliding	Cañada de Las Cruces	Recent slump-block
G4	Landsliding	Cañada de Las Cruces	Active earth flows, slumps
G5	Landsliding	Nojoqui Canyon	Old slump/earth flow
G6	Liquefaction/lurching	Santa Ynez River/ Dry Creek	Saturated, unconsolidated alluvial deposits
		Santa Ynez River	
G7	Landsliding	Dry Creek	Stream bank caving/slumping
G8	Liquefaction/lurching	Sisquoc River	Saturated, unconsolidated alluvial deposits
G9	Liquefaction/lurching	Sisquoc River	Saturated, unconsolidated alluvial deposits
G10	Landsliding	La Brea Canyon	Debris slide
G11	Landsliding	North Fork La Brea Creek confluence	Slump—debris slide
G12	Landsliding	La Brea Canyon	Susceptible to new sliding in severely shattered and fractured sandstone and shale
G13	Liquefaction/lurching	Sisquoc River	Saturated, unconsolidated alluvial slumps
G14	Landsliding	Lower Suey Canyon	Large slump block
G15	Landsliding	Upper Suey Canyon	Slump block/earth flow
G16	Landsliding	Los Coches Mtn.	Large composite earth-flow
G17	Landsliding	Cuyama River Gorge	Complex, varied sliding, largely in sheared/altered Franciscan rocks; susceptible to new sliding in severely shattered and fractured sandstone and shale
G18	Landsliding	West end of Cuyama Valley	Slump block
G19	Liquefaction/lurching	West end of Cuyama Valley	Poorly to unconsolidated alluvial deposits, may be locally saturated
GW1	Sensitive to potential ground-water contamination	Santa Ynez River	Shallow alluvial aquifer, high degree of use for municipal, domestic, and irrigation water
GW2	Sensitive to potential ground-water contamination	San Antonio Basin	Unconsolidated sediments
GW3	Sensitive to potential ground-water contamination	Sisquoc River	Shallow alluvial aquifer
GW4	Sensitive to potential ground-water contamination	Cuyama River Valley	Shallow alluvium and unconsolidated sediments

[1]Code A = Aquatic Biology
G = Geology
GW = Groundwater
L = Land Use
S = Soils
T = Terrestrial Biology

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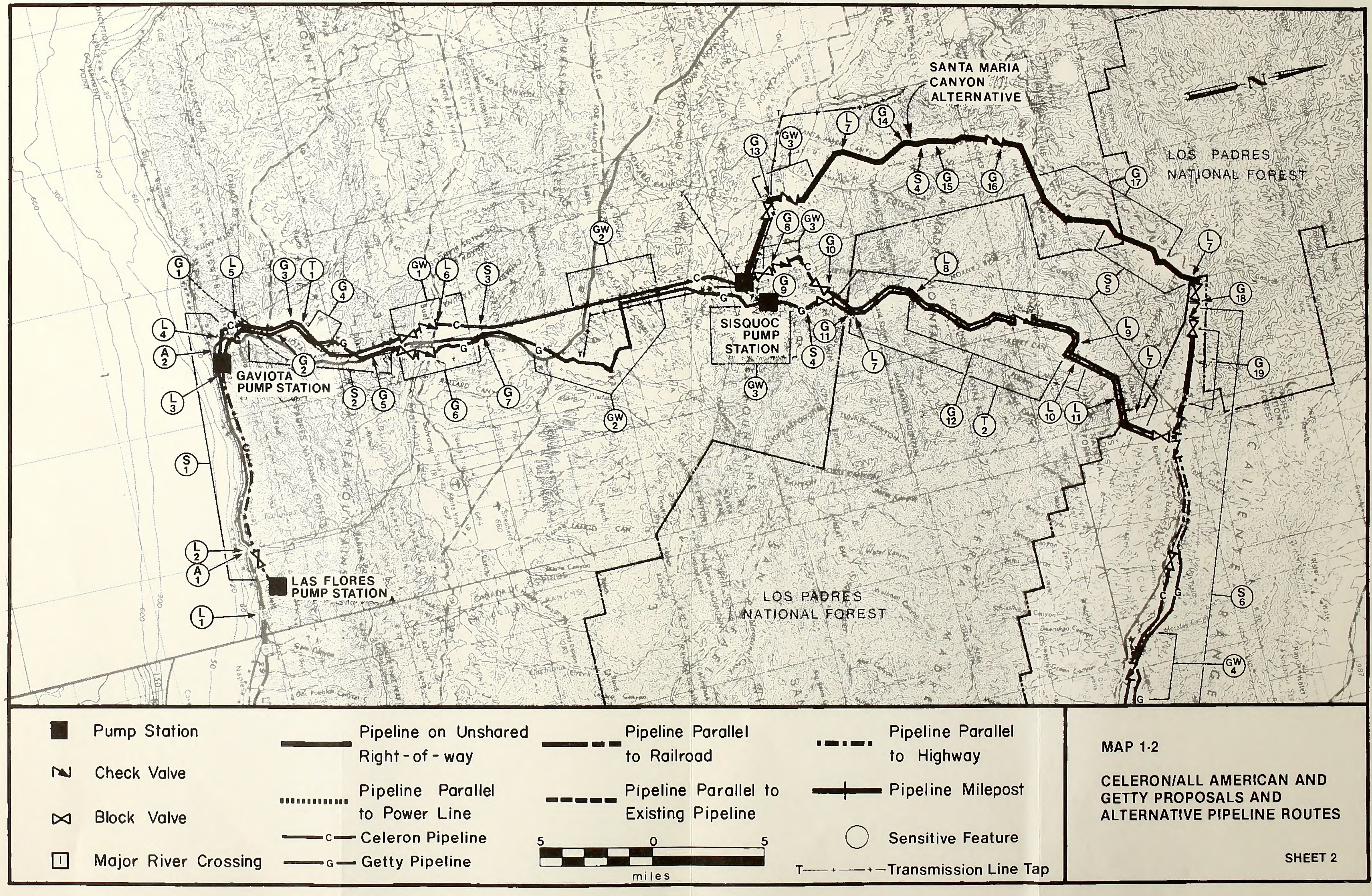
SHEET 2
(CONT'D)

Code[1]	Impact	Location	Description
L1	Disruption of park activities	2 miles east of Corral Canyon	El Capitan State Park
L2	Disruption of park activities	2.5 miles west of Corral Canyon	Refugio State Park
L3	Disruption of school activities	Adjacent to Gaviota Pump Station	Vista Del Mar School
L4	Disruption of park activities	West of Gaviota Pump Station	Gaviota State Park
L5	Disruption of recreation activities	Gaviota Pass	Gaviota Pass Rest Area
L6	Land use impacts	Buellton	Town of Buellton
L7	Recreation impacts	East of Santa Monica	Los Padres N.F. boundary
L8	Wilderness impacts	La Brea Canyon	Horseshoe Springs Wilderness Further Planning Area (FPA)
L9	Wilderness impacts	La Brea Canyon	Miranda Pine FPA
L10	Wilderness impacts	La Brea Canyon	La Brea FPA
L11	Wilderness impacts	South of Cuyama Valley	Spoor Canyon FPA
S1	Water erosion, soil slumping, high shrink-swell	Las Flores to Gaviota Pass	Steep slopes, clayey textures
S2	Water erosion, revegetation, soil slumping	Gaviota Pass to south of Santa Ynez River	Steep slopes, depth to rock, clayey textures
S3	Water erosion, revegetation	North of Zaca Creek & Dry Creek confluences	Steep slopes, depth to rock, clayey textures
S4	Water erosion, revegetation, soil slumping	South of Sisquoc River to Los Padres N.F. boundary	Steep slopes, depth to rock, clayey textures
S5	Water erosion, revegetation, some soil slumping	Los Padres N.F.	Steep slope, depth to rock
T1	Construction effects on special status plant	Gaviota Pass and Refugio Pass	Refugio manzanita (species of concern), undisturbed chaparral, 400-600 ft.
T2	Construction effects on special status plants	La Brea Canyon	Live oak, riparian vegetation protected in Santa Barbara Co.

[1]Code A = Aquatic Biology L = Land Use
G = Geology S = Soils
GW = Groundwater T = Terrestrial Biology

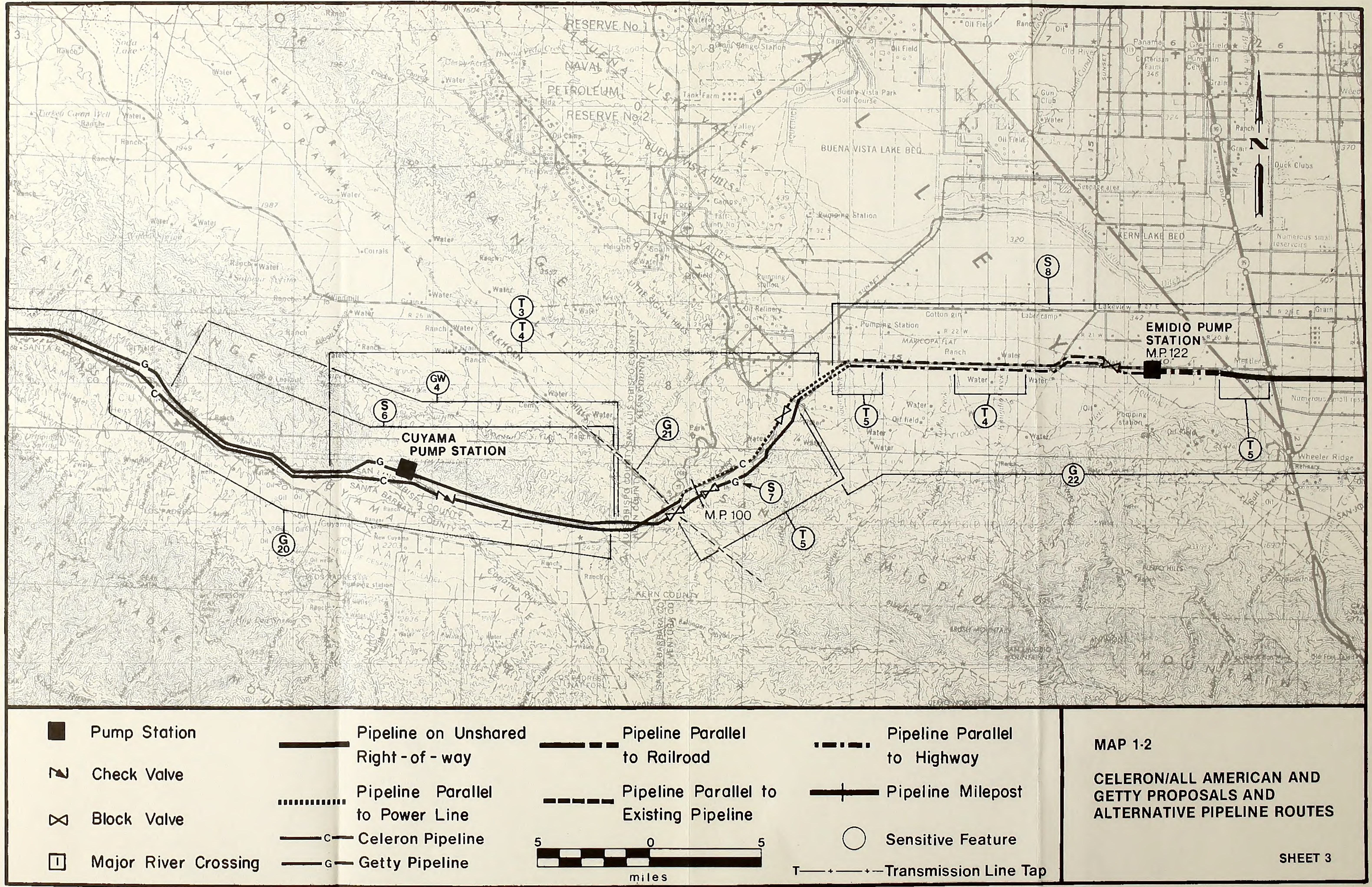


SHEET 3

Code[1]	Impact	Location	Description
G20	Liquefaction/lurching	East half of Cuyama Valley	Poorly to unconsolidated alluvial deposits, may be locally saturated
G21	Surface fault rupture	San Emigdio Mts.	San Andreas fault zone; evidence of historic offset
G22	Liquefaction/lurching	Southern San Joaquin Valley	Poorly to unconsolidated alluvial deposits, may be locally saturated; local failures during 1952 earthquake
GW4	Sensitive to potential ground-water contamination	Cuyama River Valley	Shallow alluvium and unconsolidated sediments
S6	Revegetation, horizon mixing	Cuyama Valley	Strongly saline, some irrigated cropland
S7	Water erosion	Emigdio Mtns.	Steep slopes
S8	Mixing of surface and subsurface soils leading to salinity problems at surface, compaction	San Joaquin Valley (southwestern Kern Co.)	Salinity, perched water table in irrigated croplands
T3	Construction effects on special status wildlife	Cuyama Valley	Giant kangaroo rat (state list-endangered), fine soils with sparse vegetation
T4[2]	Construction effects on special status wildlife	Cuyama Valley	Blunt-nosed leopard lizard (federal list-endangered), alkali sinks, sandy loam soils
T5	Construction effects on special status wildlife	East of Cuyama Valley	San Joaquin antelope squirrel (state list-rare), dry, sparsely vegetated, loamy soils

[1]Code G = Geology
GW = Groundwater
S = Soils
T = Terrestrial Biology

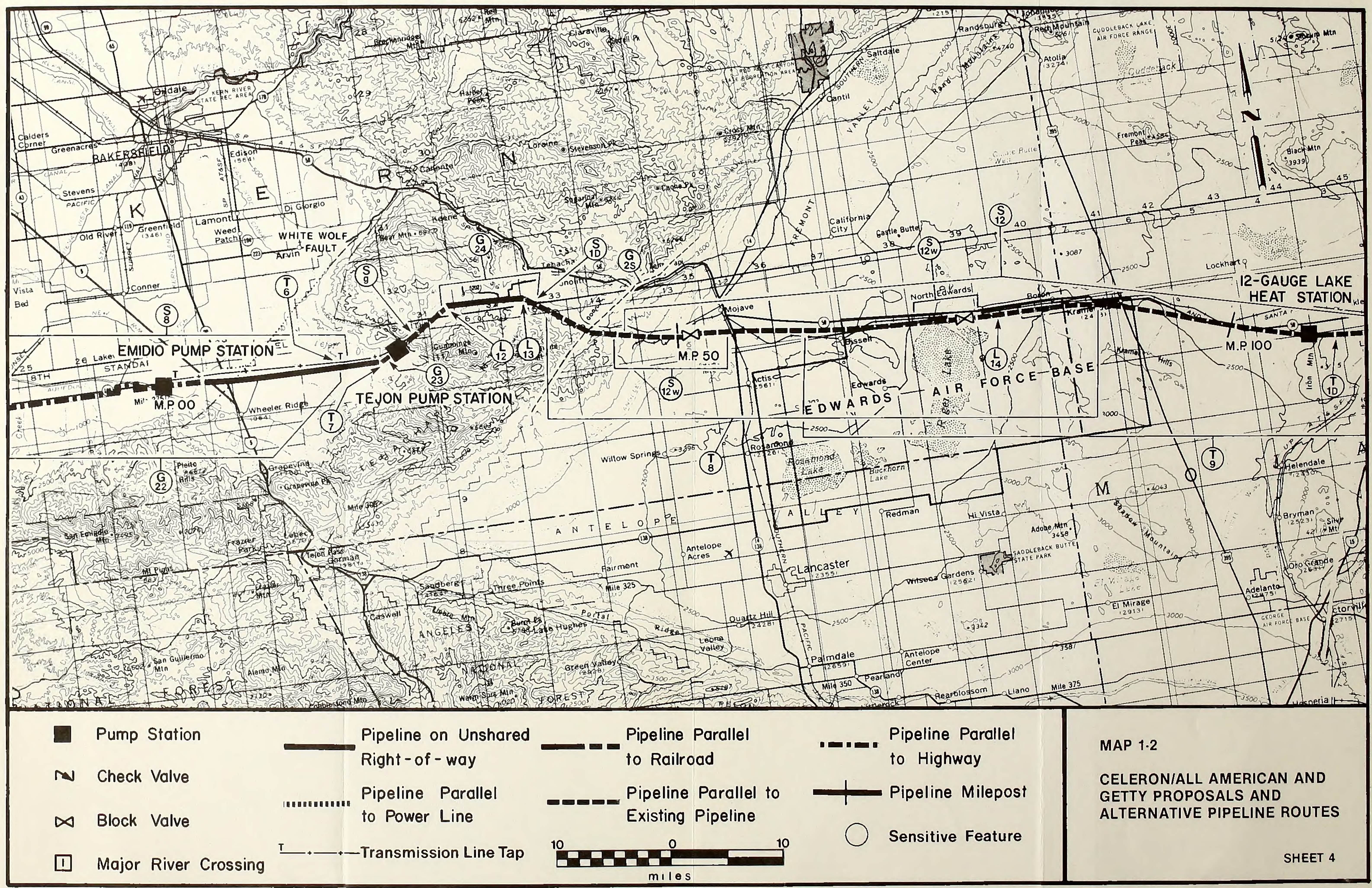
[2]Terrestrial and Aquatic Threatened and Endangered Species Locations—It is standard convention in public documents to not provide the precise location of threatened or endangered species. This is done to ensure their protection from disturbance.



SHEET 4

Code[1]	Impact	Location	Description
G22	Liquefaction/lurching	Southern San Joaquin Valley	Poorly to unconsolidated alluvial deposits, may be locally saturated; local failures during 1952 earthquake
G23	Liquefaction/lurching	Tejon Creek	Poorly to unconsolidated alluvial deposits, may be locally saturated
G24	Liquefaction/lurching	Cummings Valley, Brite Valley Tehachapi Valley	Poorly consolidated alluvial deposits, may be locally saturated
G25	Surface fault rupture	Oak Creek Pass	Garlock fault zone; evidence of possible historic offset
L12	Conflict with Specific Development Plans	South of Tehachapi Pass	Cummings Valley Residential Area
L13	Recreation impact	Tehachapi Pass	Pacific Crest National Scenic Trail
L14	Disruption of base activities	Edwards AFB	Edwards Air Force Base, crosses base for 0.5 mile
S8	Mixing of surface and sub-surface soils leading to salinity problems at surface, compaction	San Joaquin Valley (Southwestern Kern Co.)	Salinity, perched water table in irrigated croplands
S9	Water erosion, revegetation	Tehachapi Mtns.	Very steep slopes, depth to rock
S10	Water erosion and deposition	Tehachapi Valley (Water, Blackburn, Mendleburu, Antelope Canyons)	Subject to flooding
S12	Wind erosion (S12W), compaction, flash flood potential, water erosion	East of Tehachapi Mtns. to west of Blythe (Mojave Desert)	Coarse-textured surface layer saline/alkaline, clayey textures (S12W: dunes, sand-covered fans, dry lake beds)
T6	Construction effects on special status plant	Tejon Hills	Comanche layia, (federal candidate species and species of concern), moist benches, valley grasslands
T7	Construction effects on special status plant	Tejon Ranch	Calico monkey flower (species of concern), granite rock outcrops
T8	Construction effects on special status plant	Double Mtn. east to Kramer	Joshua tree (protected in Kern Co.), desert slopes and mesas
T9	Construction effects on special status wildlife	Mojave Desert (Barstow to Blythe), CA	Desert tortoise (federal candidate species for threatened listing and BLM sensitive species), desert and semi-desert grasslands
T10	Construction effects on special status plant	Barstow area	Barstow woolly sunflower (federal candidate species and species of concern), sandy or rocky places

[1]Code G = Geology
L = Land Use
S = Soils
T = Terrestrial Biology



MAP 1-2

CELERON/ALL AMERICAN AND GETTY PROPOSALS AND ALTERNATIVE PIPELINE ROUTES

SHEET 4

SHEET 5

Code[1]	Impact	Location	Description
G26	Liquefaction/lurching	Mojave River at Barstow	Unconsolidated, saturated alluvium
GW5	Sensitive to potential groundwater contamination	Mojave River	Shallow alluvial aquifer, high degree of use for municipal, domestic, irrigation, and industrial water
L15	Disruption of residential uses	Barstow	Town of Barstow
S11	Water erosion and deposition, compaction, horizon mixing	Mojave River floodplain	Subject to flooding, irrigated croplands
S12	Wind erosion (S12W), compaction, flash flood potential, water erosion	East of Tehachapi Mtns. to west of Blythe (Mojave Desert)	Coarse-textured surface layer saline/alkaline, clayey textures (S12W: dunes, sand-covered fans, dry lake beds)
S13	Water erosion	Old Woman Mtns.	Steep slopes
T11	Construction effects on special status plant	Barstow area	Barstow woolly sunflower (federal candidate species and species of concern), sandy or rocky places
T12	Construction effects on special status plant	Southern Mojave Desert	Crucifixion thorn (species of concern), dry gravelly places
T13	Construction effects on special status wildlife	Mojave Desert (Barstow to Blythe)	Desert tortoise (federal candidate species and BLM sensitive species), desert and semi-desert grasslands

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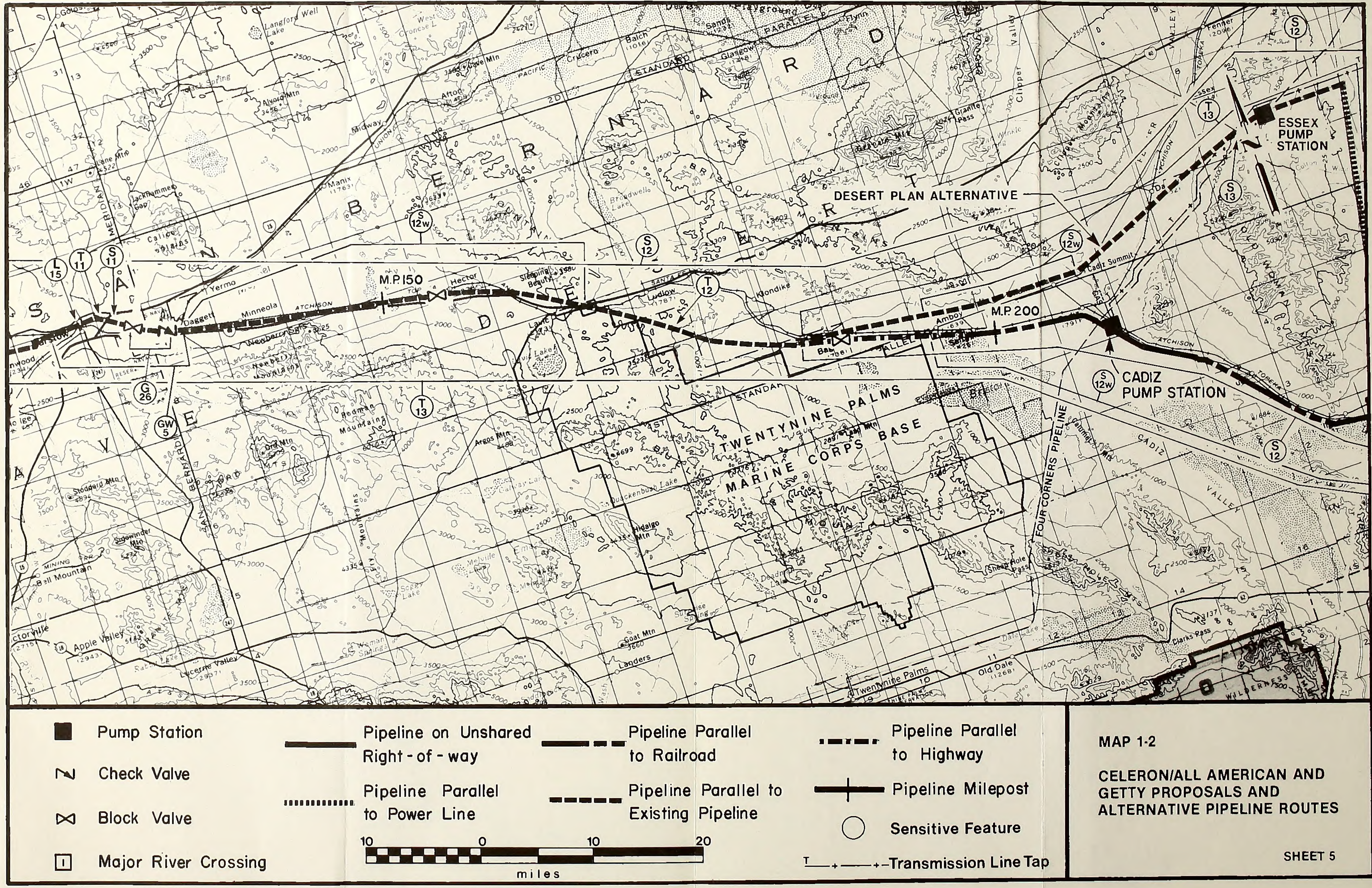

Code[1]	Impact	Location	Description
A3	Oil spill effect on special status & recreational fish	Colorado River	Black crappie, bluegill, channel catfish, green sunfish, flathead catfish, largemouth bass, redear sunfish, striped bass, white crappie, yellow bullhead (recreational species), razorback sucker (rare in CA and Group 3 in AZ)
G27	Liquefaction/lurching	Palo Verde Valley/ Colorado River	Poorly to unconsolidated alluvium, locally saturated
GW6	Sensitive to potential groundwater contamination	La Posa Plain	Unconsolidated sediments and locally perched water table
GW7	Sensitive to potential groundwater contamination	Centennial	Primarily unconsolidated sediments and alluvium with local variations in quality and depth to water, primarily agricultural uses
L16	Wilderness impacts	South of Cadiz	Palen-McCoy BLM WSA
L17	Disturbance to sensitive area	North of Desert Center	Patton Camp BLM ACEC
L18	Wilderness impacts	North of Desert Center	Coxcomb BLM WSA
L19	Disruption of residential & recreational activities	AZ/CA border	City of Blythe and Colorado River
L20	Disruption of recreational activities	Southeast of Quartzite	Kofa National Wildlife Refuge boundary
L21	Wilderness impacts	South of Brenda	New Water Mtns., BLM, WSA
L22	Wilderness impacts	East of Kofa NWR	Little Horn Mtns., BLM, WSA
L23	Wilderness impacts	East of Kofa NWR	Eaglefail Mtns., BLM, WSA
S12	Wind erosion (S12W), compaction, flash flood potential, water erosion	East of Tehachapi Mtns. to west of Blythe (Mojave Desert)	Coarse-textured surface layer saline/alkaline, clayey textures (S12W: dunes, sand-covered fans, dry lake beds)
S14	Mixing of sandy topsoils and subsoils will cause compaction, puddling	Blythe area	Perched water table in irrigated croplands
S15	Water erosion and deposition, compaction	Colorado River	Subject to flooding
S16	Water erosion, revegetation	Kofa Mtns., Dome Rock Mtns.	Steep slopes, depth to rock
S17	Water erosion, revegetation	Eaglefail Mtns.	Steep slopes, depth to rock
S18	Water erosion and deposition, compaction, horizon mixing	Harquahala Plain (Centennial Wash)	Subject to flooding, agricultural lands
T14	Construction impacts on special status wildlife	Mojave Desert (Barstow to Blythe)	Desert tortoise (federal candidate species and BLM sensitive species), desert and semi-desert grasslands
T15	Construction impacts on sensitive ecological community	Rice Valley	Desert dune communities
T16	Construction impacts on sensitive ecological community	Rice to Blythe	Ironwood wash communities
T17	Construction & operation (secondary) effects on sensitive wildlife	Dome Rock Mtns., Kofa National Wildlife Refuge	Desert bighorn sheep

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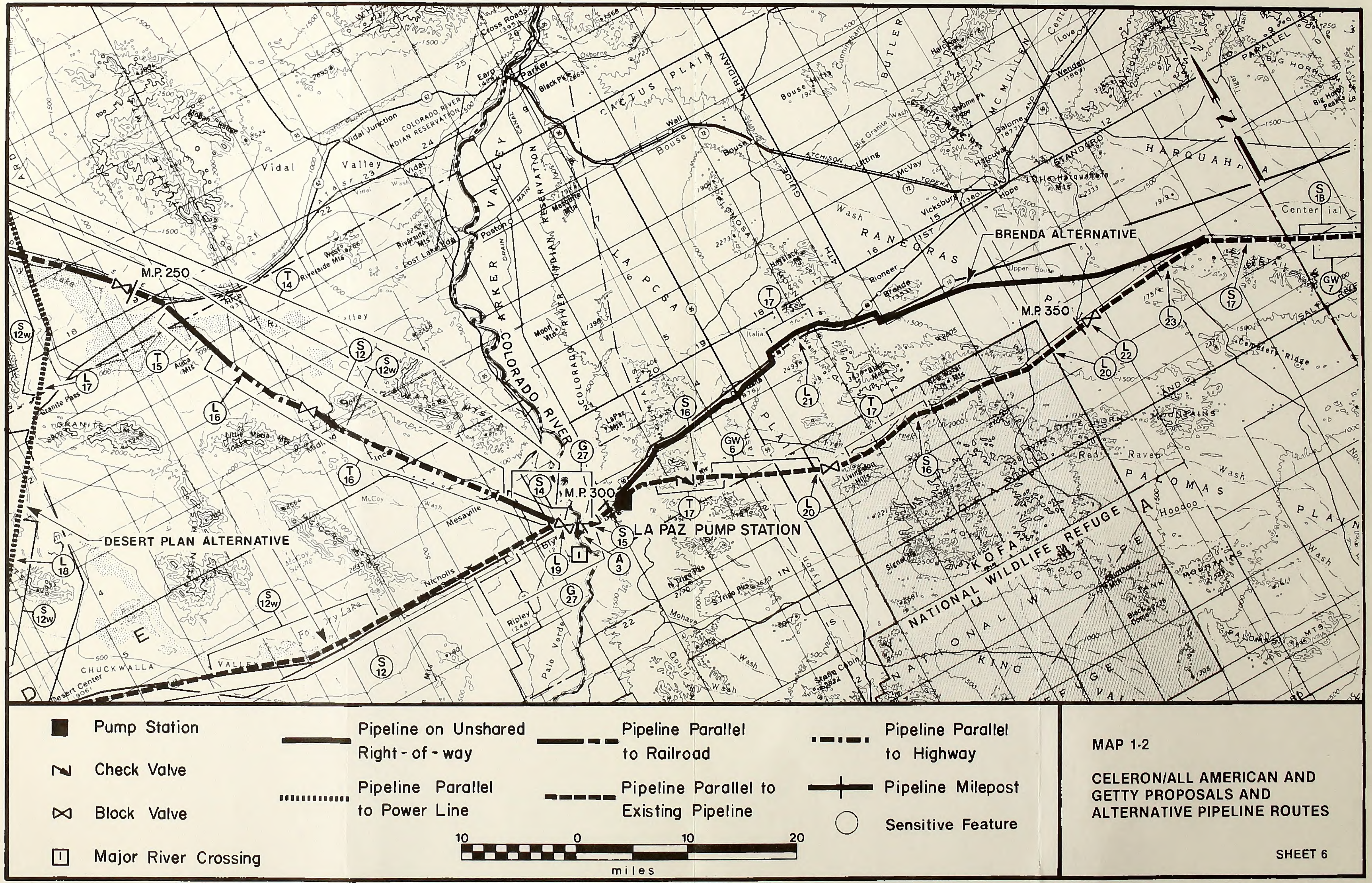

SHEET 7

Code[1]	Impact	Location	Description
A4	Oil spill effect on recreational fish	Gila River	Bluegill, channel catfish, largemouth bass (recreational species)
G28	Liquefaction/lurching	Gila River	Unconsolidated, saturated alluvium
G29	Subsidence	Coolidge	Known subsidence due to ground water overdraft; historic surface scarps, local fissures
GW7	Sensitive to potential ground-water contamination	Centennial	Primarily unconsolidated sediments and alluvium with local variations in quality and depth to water, primarily agricultural uses
GW8	Sensitive to potential ground-water contamination	Lower Santa Cruz Basin	Primarily unconsolidated sediments and alluvium with local variations in quality and depth to water, primarily agricultural uses
L24	Wilderness impacts	South of Buckeye	North Maricopa Mtns., BLM, WSA
S18	Water erosion and deposition, compaction, horizon mixing	Harquahala Plain (Centennial Wash)	Subject to flooding, agricultural lands
S19	Water erosion and deposition, compaction, horizon mixing	Gila River near Gillespie Dam	Subject to flooding, agricultural lands
S20	Water erosion and deposition, compaction, horizon mixing	Between Randolph and Rainbow Valley	Subject to flooding, agricultural lands
S21	Water erosion and deposition, compaction	North of Tortolita Mtns. and east of Picacho Mtns.	Subject to flooding

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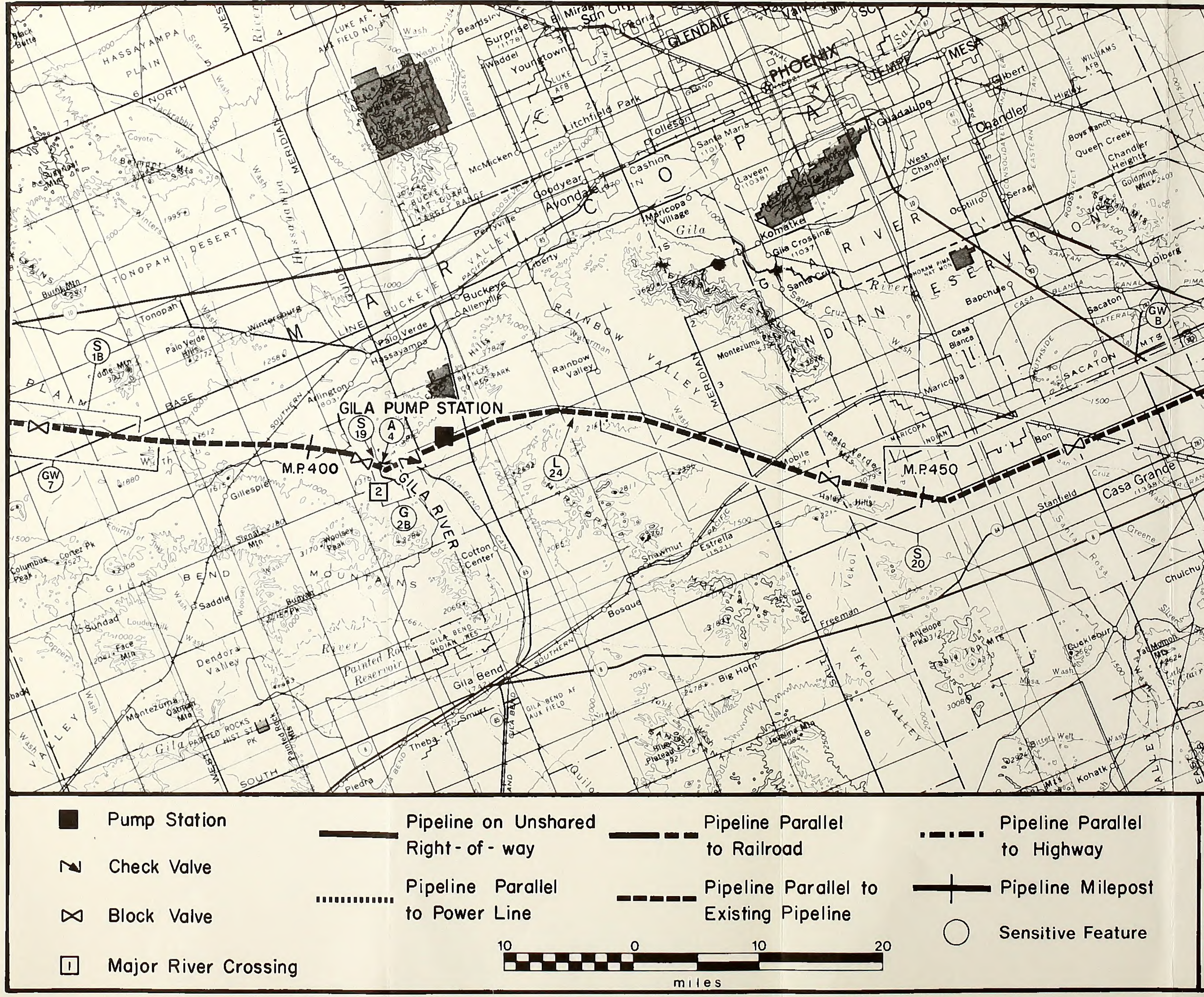

MAP 1-2

CELERON/ALL AMERICAN AND GETTY PROPOSALS AND ALTERNATIVE PIPELINE ROUTES

SHEET 7

SHEET 8

Code[1]	Impact	Location	Description
A5	Construction and oil spill effects on fish habitat and special status fish	Hot Springs and Bass Canyon Creeks (Muleshoe Ranch Preserve)	Gila chub (Group 3 in AZ), Sonora sucker, desert sucker, longtin dace, speckled dace (native species)
G30	Liquetaction, lurching	San Pedro River	Unconsolidated, saturated alluvium
G31	Subsidence	Sulphur Springs Valley near Willcox	Known subsidence due to groundwater overdraft; historic surface scarps, local tissures
G32	Subsidence	San Simon Valley near Bowie	Known subsidence due to groundwater overdraft; historic surface scarps, local tissures
GW8	Sensitive to potential ground-water contamination	Lower Santa Cruz Basin	Primarily unconsolidated sediments and alluvium with local variations in quality and depth to water, primarily agricultural uses
GW9	Sensitive to potential ground-water contamination	San Pedro River Basin	Primarily unconsolidated sediments and alluvium with local variations in quality and depth to water, primarily agricultural uses
GW10	Sensitive to potential ground-water contamination	Sulphur Springs Valley	Primarily unconsolidated sediments and alluvium with local variations in quality and depth to water, primarily agricultural uses
GW11	Sensitive to potential ground-water contamination	San Simon Basin	Primarily unconsolidated sediments and alluvium with local variations in quality and depth to water, primarily agricultural uses
S21	Water erosion and deposition, compaction	North ot Tortolita Mtns. and east of Picacho Mtns.	Subject to flooding
S22	Water erosion, revegetation	Santa Catalina Mtns. near Oracle	Moderately steep to steep slopes
S23	Water erosion, revegetation	Winchester and Dos Cabazos Mtns.	Steep slopes, depth to rock
S24	Water and wind erosion, revegetation	North of Wilcox Dry Lakebed	Sodic/saline
T18	Construction and operation (secondary) effects on wildlife habitat and special status wildlife	Hookers Hot Springs area, south of Coronado N.F., Muleshoe Ranch Nature Reserve	Black hawk, gray hawk, zone-tailed hawk, northern beardless tyrannulet (AZ Group 2 or 3), riparian communities

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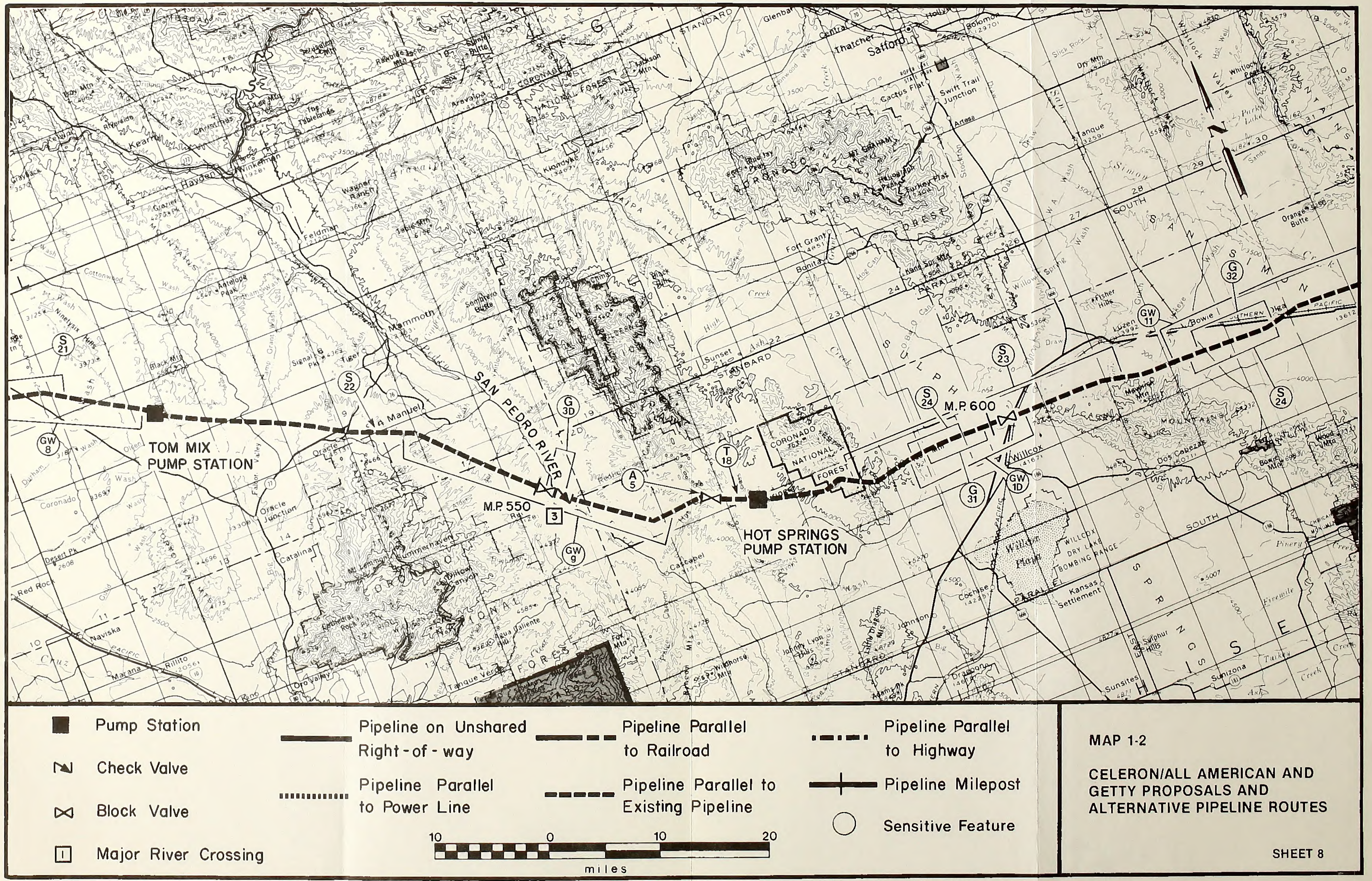

SHEET 9

Code[1]	Impact	Location	Description
GW11	Sensitive to potential ground-water contamination	San Simon Basin	Primarily unconsolidated sediments and alluvium with local variations in quality and depth to water, primarily agricultural uses
GW12	Sensitive to potential ground-water contamination	Animas/Lordsburg Valleys	Primarily unconsolidated sediments and alluvium with local variations in quality and depth to water, primarily agricultural uses
GW13	Sensitive to potential ground-water contamination	Mimbres Valley	Primarily unconsolidated sediments and alluvium with local variations in quality and depth to water, primarily agricultural uses
L25	Disruption of residential activities	Lordsburg	Town of Lordsburg
L26	Disruption of residential activities	Deming	Town of Deming
S25	Water erosion, revegetation	East of San Simon	Steep slopes, depth to bedrock
S26	Revegetation	Animas Valley	Alkalinity
S27	Horizon mixing, compaction	Deming area and north of Florida Mtns.	Agricultural lands
S28	Wind erosion	East of Florida Mtns. and west of Aden	Coarse-textured surface layer

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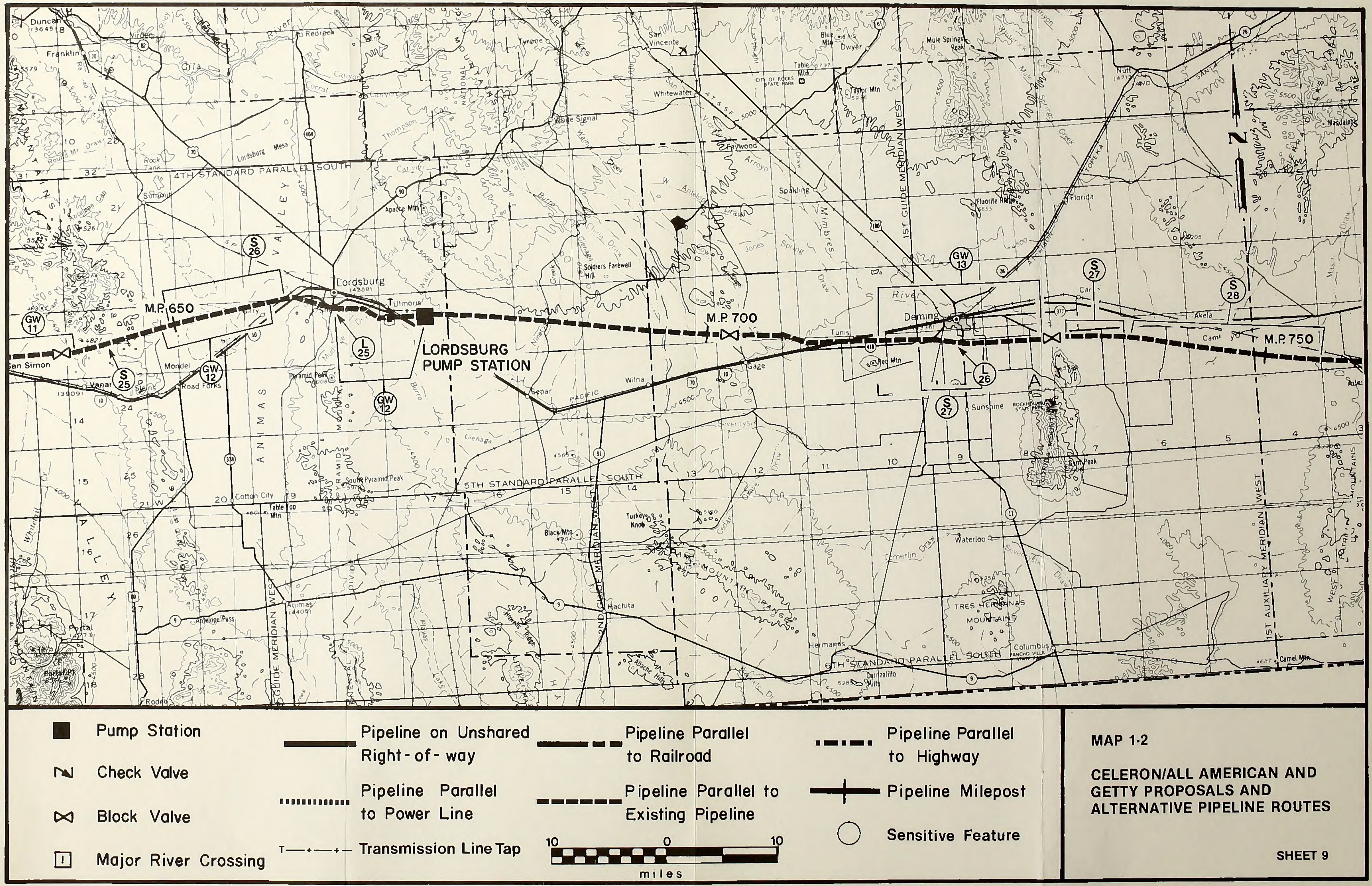

SHEET 10

Code[1]	Impact	Location	Description
A6	Oil spill effects on special status and recreational fish	Rio Grande River	Bluegill, channel catfish, flathead catfish, largemouth bass, rainbow trout (recreational species), Mexican tetra (Group 2 in NM)
G33	Liquefaction/lurching	Rio Grande River	Unconsolidated, saturated alluvial deposits
GW14	Sensitive to potential ground-water contamination	Rio Grande Valley	Primarily unconsolidated sediments and alluvium with local variations in quality and depth to water, primarily agricultural and municipal uses
L27	Disruption of base activities	Northeast of El Paso	Fort Bliss Military Reservation boundary
L28	Disruption of park activities	Hueco Mtns. east of El Paso	Hueco Tanks State Park
S29	Wind erosion	Aden to Chamberina	Coarse-textured surface layer
S30	Water erosion and deposition, compaction, horizon mixing	Rio Grande River	Subject to flooding, irrigated cropland
S31	Wind erosion	West of Hueco Mtns. and east of Newman	Coarse-textured surface layer
S32	Flooding, revegetation	Salt Basin west of Guadalupe Mtns.	Alkalinity

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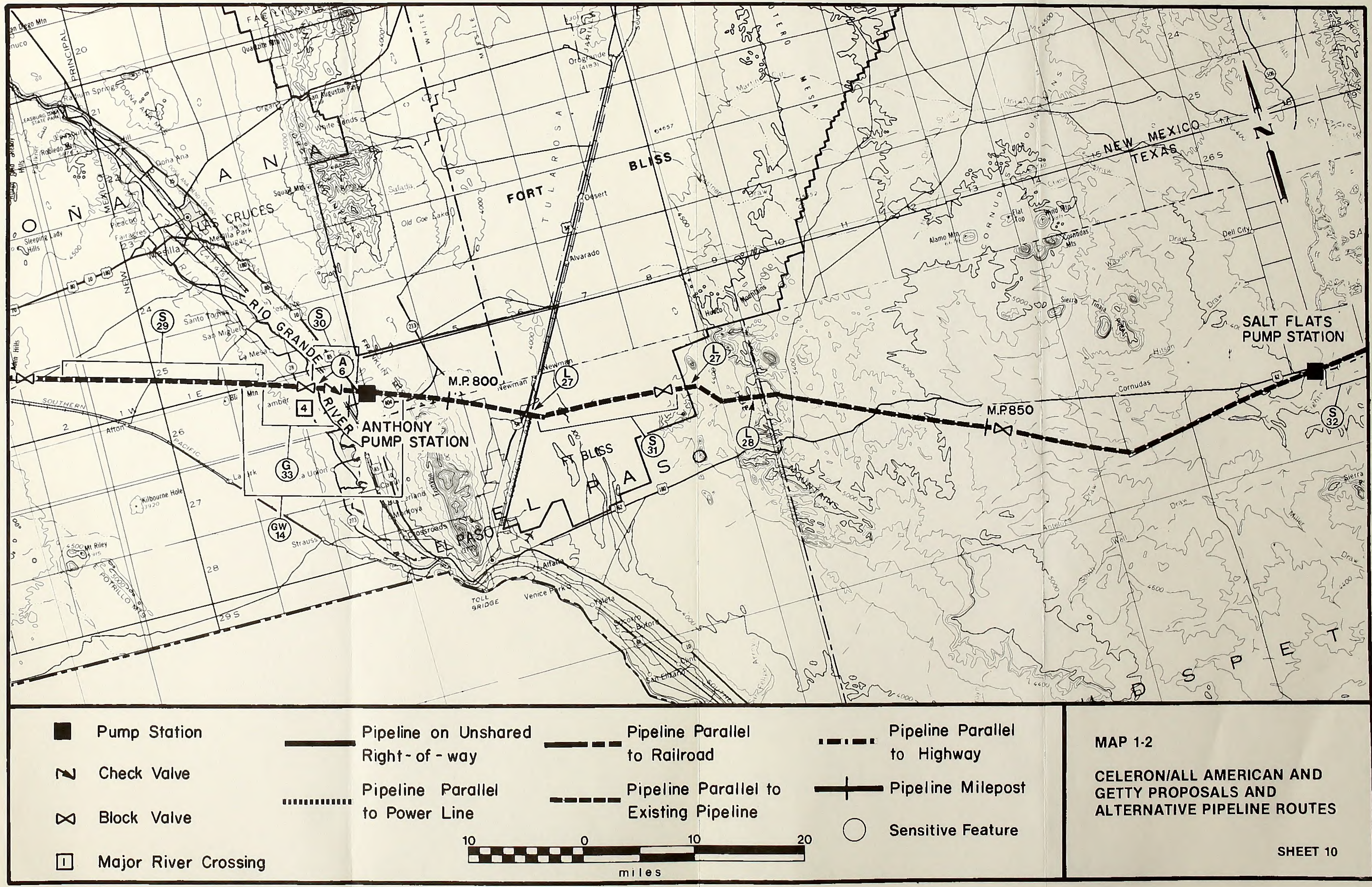

SHEET 11

Code[1]	Impact	Location	Description
A7	Oil spill effects on recreational fish	Pecos River	Bluegill, channel catfish, flathead catfish, largemouth bass, white bass (recreational species)
G34	Solution collapse	Delaware Basin	Local sinkholes, other surface collapse structures; potential for sudden local collapse
G35	Liquefaction/lurching	Pecos River	Unconsolidated, saturated alluvial deposits
GW15	Sensitive to potential ground-water contamination	Pecos River Valley	Alluvial and consolidated rock aquifers primarily developed for agricultural uses
L29	Disruption of recreation activities	Northeast of El Paso	Guadalupe National Park
L30	Disruption of residential activities	Wink	Town of Wink
S32	Flooding, revegetation	Salt Basin west of Guadalupe Mtns.	Alkalinity
S33	Water erosion and deposition, compaction	Pecos River	Subject to flooding
S34	Wind erosion	Between Pecos River and Kermit	Coarse-textured surface layer
T19	Construction and secondary effects on sensitive community	South of Guadalupe Mtns. Natl. Park	Gypsum Dunes Nature Preserve, TX Nature Conservancy

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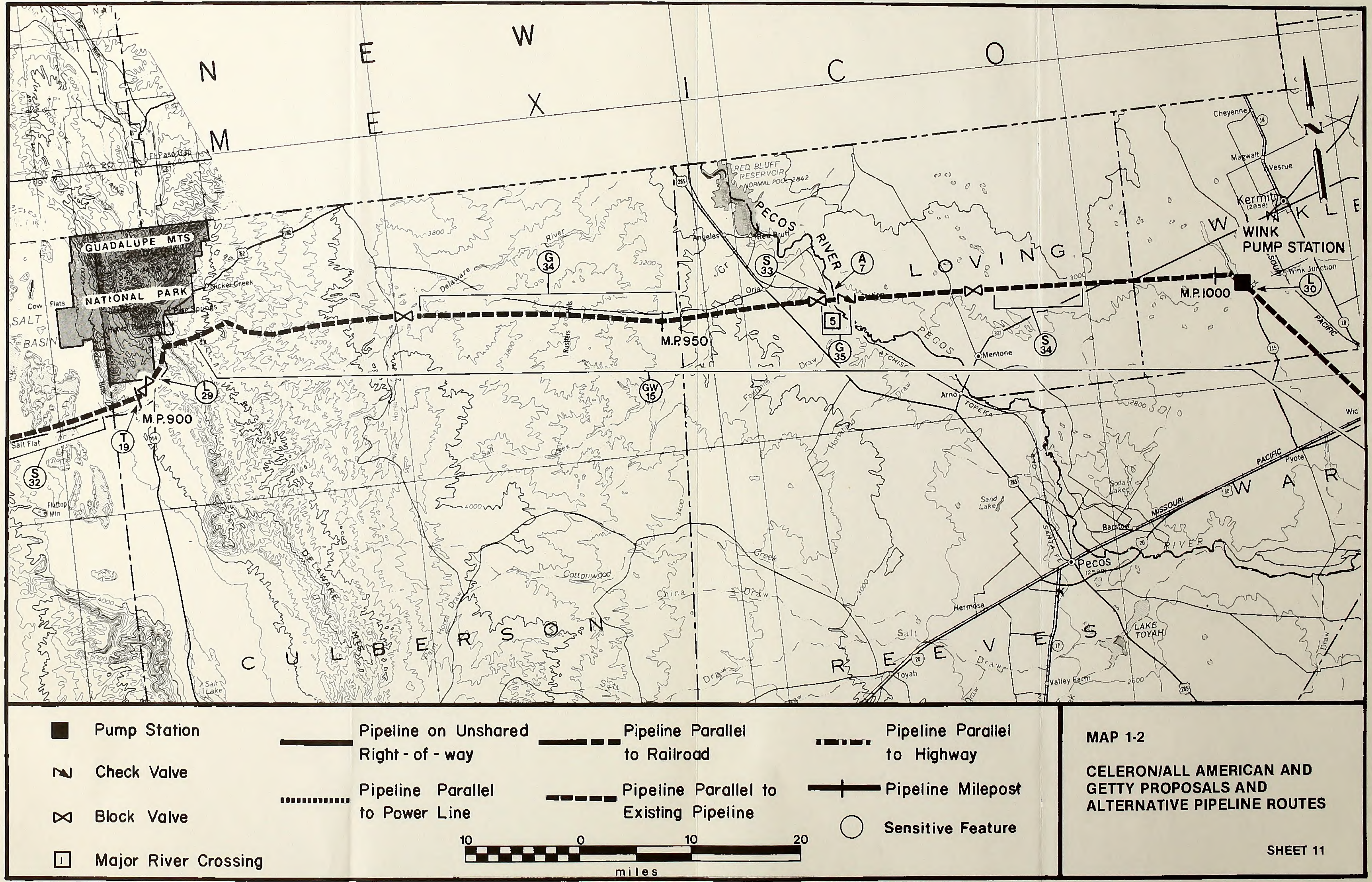

SHEET 12

Code[1]	Impact	Location	Description
GW15	Sensitive to potential ground-water contamination	Pecos River Valley	Alluvial and consolidated rock aquifers primarily developed for agricultural uses
L31	Disruption of residential activities	Monahans	Town of Monahans

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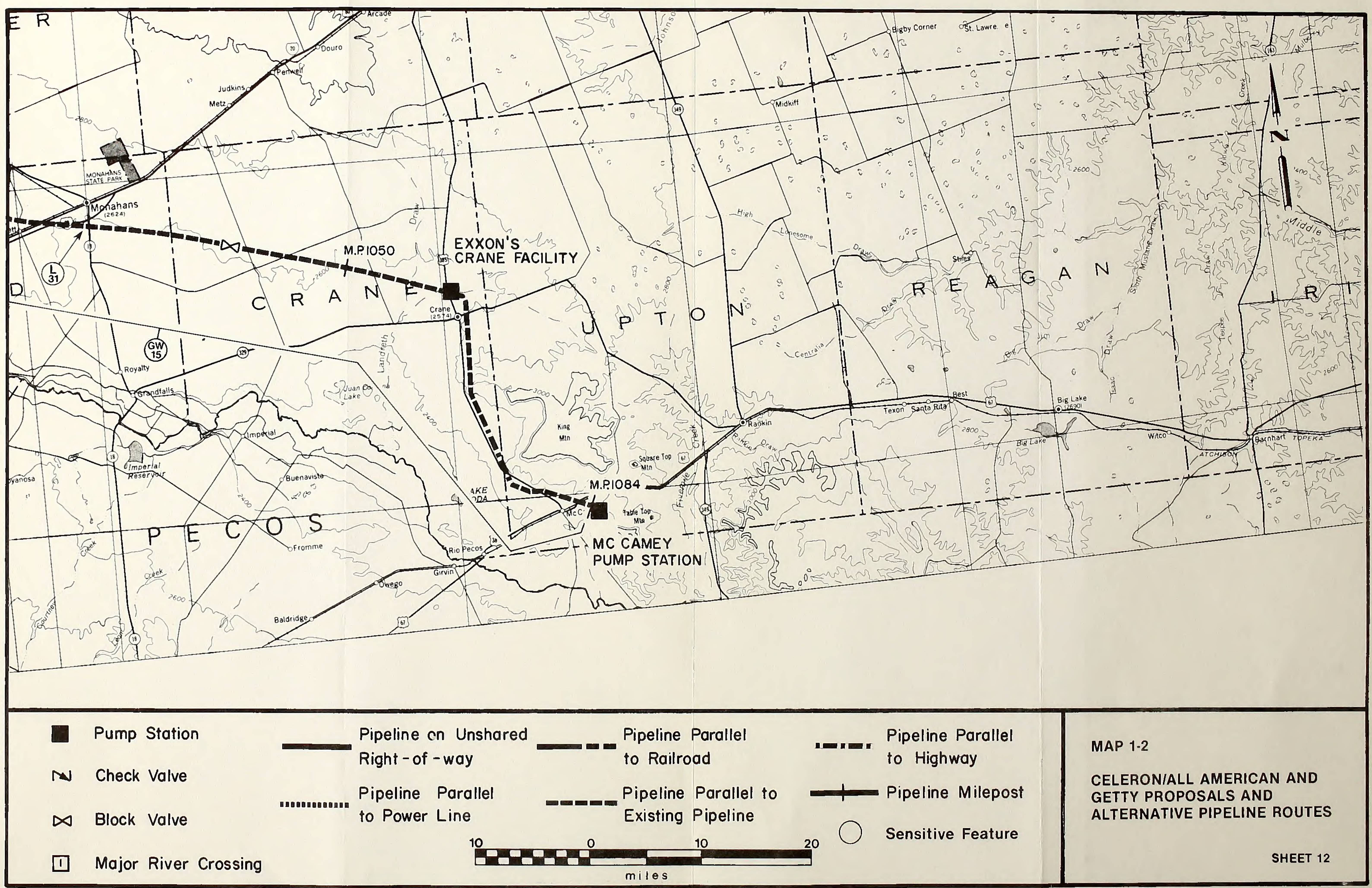
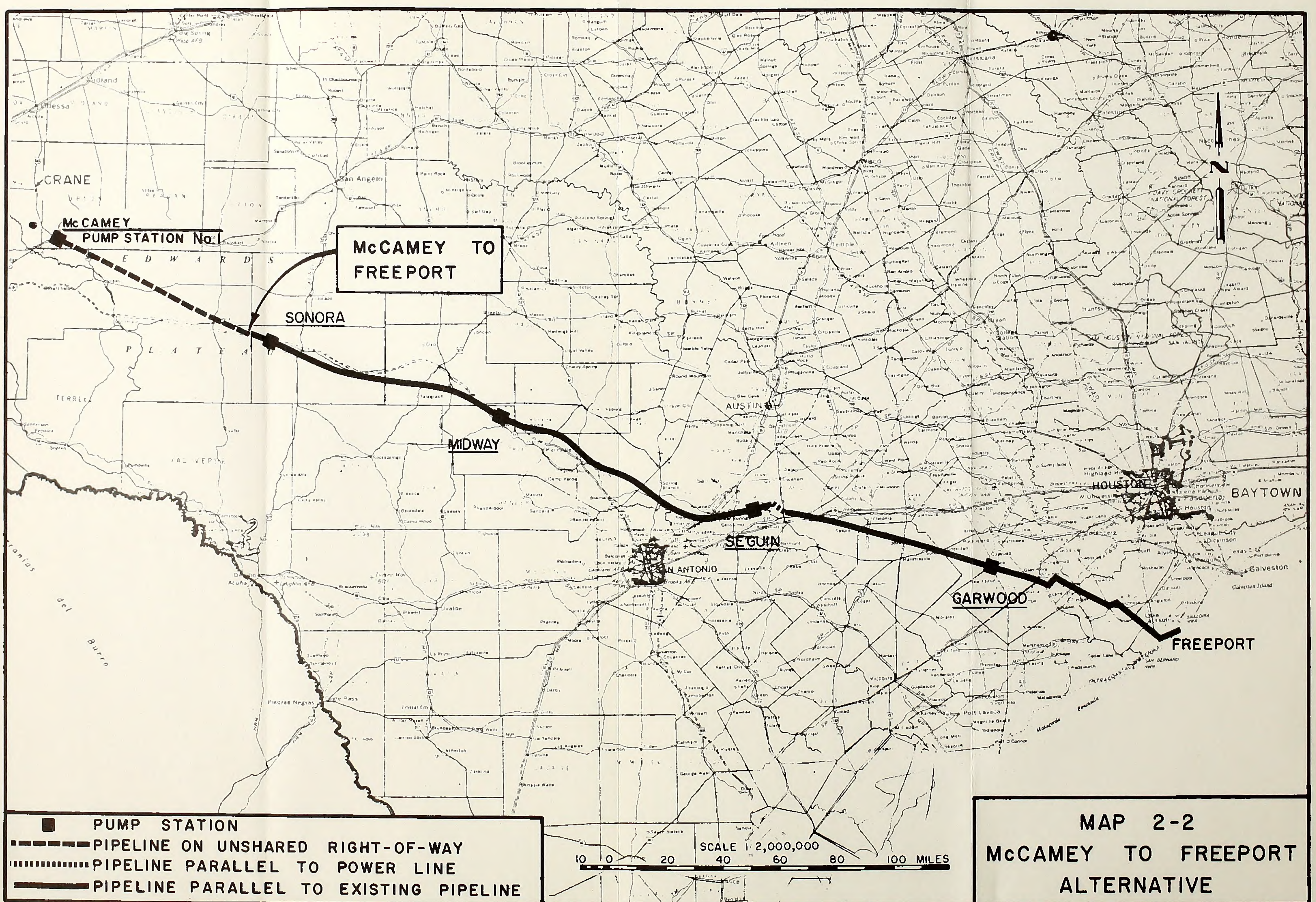


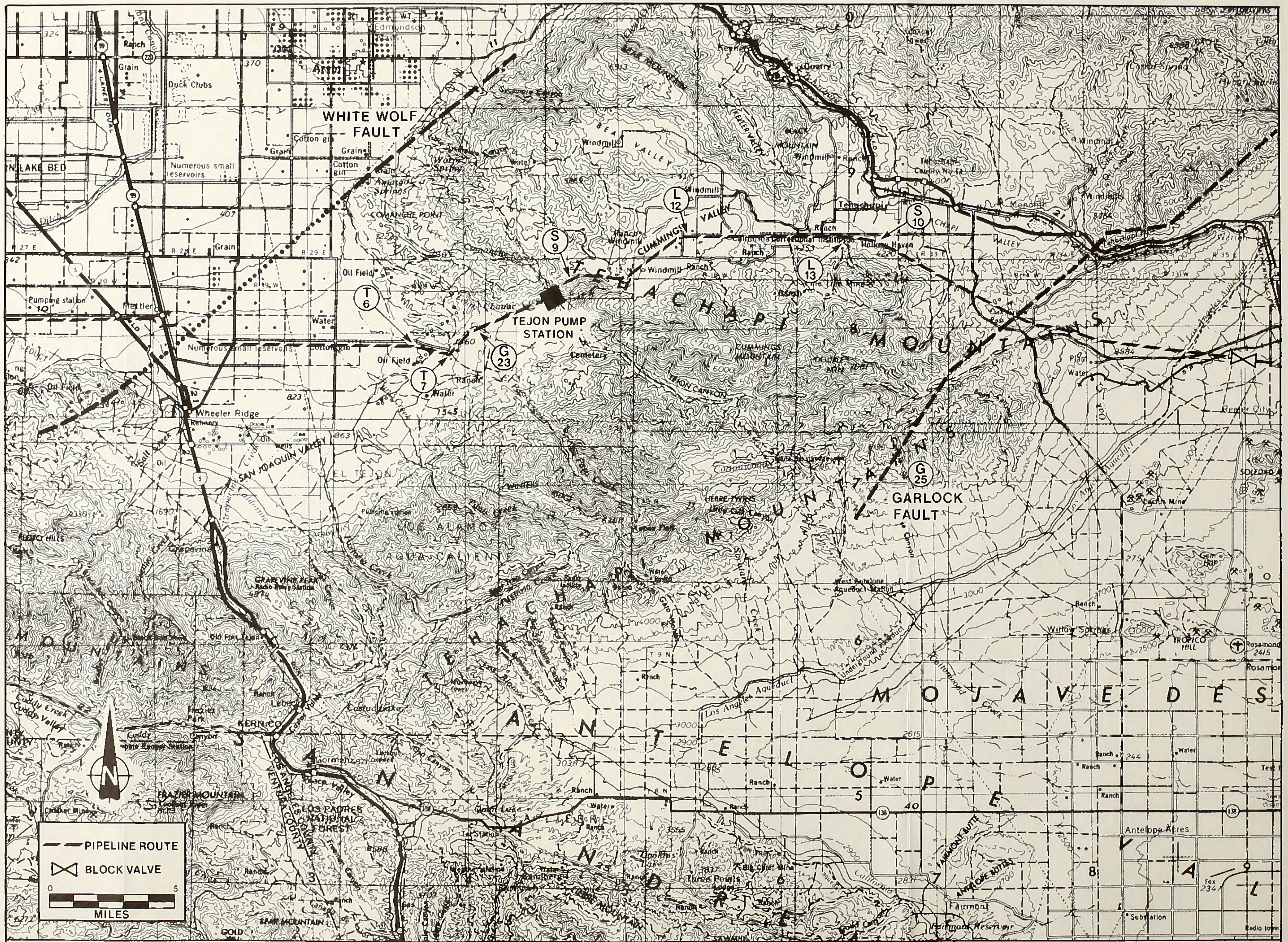
MAP 1-2

CELERON/ALL AMERICAN AND GETTY PROPOSALS AND ALTERNATIVE PIPELINE ROUTES

SHEET 12



MAP 2-2
McCAMEY TO FREEPORT
ALTERNATIVE



MAP 3-1 PROPOSED PIPELINE CROSSING OF THE TEHACHAPI MOUNTAINS