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March 29, 2002

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RE: Data Responses, Set 1H
Cosumnes Power Plant (01-AFC-19)

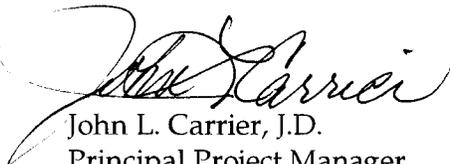
On behalf of the Sacramento Municipal Utility District, please find attached 12 copies and one original of Data Responses, Set 1H, in response to Staff's Data Requests dated December 10, 2001.

Due to the size of the aerial photos, we are submitting three hard copies and three CD-ROMs of the preliminary draft wetland delineations (Attachment BR-19).

Please call me if you have any questions.

Sincerely,

CH2M HILL


John L. Carrier, J.D.
Principal Project Manager

c: Colin Taylor/SMUD
Kevin Hudson/SMUD
Steve Cohn/SMUD

**COSUMNES POWER PLANT
(01-AFC-19)**

DATA RESPONSE, SET 1H
(Responses to Data Requests: 19, 20, 25, 29, 30, 31, and 39)

Submitted by
**SACRAMENTO MUNICIPAL
UTILITY DISTRICT (SMUD)**

March 29, 2002



2485 Natomas Park Drive, Suite 600
Sacramento, California 95833-2937

Technical Area: Biological Resources

CEC Authors: Melinda Dorin and Rick York

CPP Author: EJ Koford

BACKGROUND

There are three drainages in the project site that the applicant proposes to reroute. There also may be impacts to Clay Creek, vernal pools along the transmission line corridor (AFC Section 8.2.5), and wetlands along the proposed natural gas pipeline route (AFC Table 8.14-8). AFC Section 8.2.3.2 states that wetland delineations of the project area were completed in April 2000. Wetland areas were depicted in AFC Figures 8.2-1 and 8.2-1R very generally and on a regional scale. USFWS guidance on vernal pools states that indirect and direct impacts are likely to occur when any project is within 250 feet of a vernal pool. Staff does not have enough information to make a final determination on whether direct or indirect impacts may occur to the vernal pools during the construction and maintenance of the transmission towers, gas pipeline, project site, construction laydown area, and water pipeline.

DATA REQUESTS

19. Provide a figure (or aerial photos) with a scale of 1" = 100' outlining the vernal pools and where jurisdictional wetlands occur within 250 feet of the site, the construction laydown area, and along all the linear facilities.

Response: A wetland delineation figure and report for the project site was provided to CEC in an earlier response. Included as Attachment BR-19 to this response is the preliminary mapping of wetland and sensitive biological features that occur along the proposed gas pipeline. Due to the size of this attachment, 3 hard copies and 3 copies on CD-ROM are being provided to CEC staff. Field surveys for wetlands were initiated immediately upon the determination of the gas pipeline route. Field surveys consisted of verifying wetlands according to the 1987 Army Corps of Engineers Manual, flagging them and collecting real-time GPS coordinates using RTK GPS. The results are overlaid on aerial photographs that were shot of the project area. The mapping effort is not complete, and these aerials will be replaced at a future date when additional data and verifications are completed. However, the information in these data can be helpful in determining impacts. It is important to recognize some limitations in this version of the figures.

- The photographs in these figures are not orthographically corrected and georeferenced, but the mapped polygons are. This means

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polygons do not necessarily line up directly over the photograph because of photographic distortion.

- In response to comments from the CEC, CDFG, USFWS and Nature Conservancy, some modifications to the proposed route were made after field surveys were completed (e.g., Arno Road and Cemetery). These areas are evident where delineated wetlands do not align with the proposed corridor and will require supplemental surveys. These areas will be surveyed and reported with the next iteration of these figures.
 - Polygons have not been rectified with other field information. The full areal extent of indirect impacts will be done with a combination of field data, aerial photographs and wetland delineation data that have been requested from other projects. In particular, data points are correct, though the lines connecting them (drawn by the data system) are not yet corrected from field data.
 - Areas that are separated from the project site by hydrologic barriers (e.g., railroad tracks, elevated roadway or intervening topography) were not field-delineated.
 - Shape of individual polygons has not been verified from surveyor's data.
 - Some stockponds, stormwater ponds and other sharply defined aquatic features, including those on private property have not been added to figures.
 - Biological features represent best recent data for valley elderberry beetle, historical Swainson's hawk nests and burrowing owl nests (none yet).
20. Provide a table that estimates the amount of wetland habitat that may be directly or indirectly impacted within the 250-foot buffer.

Response: Based on a width of 125 feet, the total of all pools, ditches and other wetland features within the corridor is 18 acres. This estimate is considered a conservative estimate of direct wetland impacts, because the actual construction width will vary between 25 and 75 feet within the 125-foot corridor. The refinements referred to above will give a better number.

Based on the same assumptions, the total of all "pools" (generally vernal pools) is 11 acres.

COSUMNES POWER PLANT (01-AFC-19)
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The area of pools with a 250-foot buffer have not yet been quantified in a table, pending the field rectification referred to above, and receipt of wetland delineation data from some third parties (Sacramento County, AKT Company). Therefore, no estimate of indirect impacts is yet available.

BACKGROUND

AFC page 8.2-7 states that 16 special-status animals potentially occur in the project area. The section then briefly describes 11 of them and Table 8.2.3 (pages 8.2-30 to 8.2-34) lists 17 special-status animal species.

DATA REQUESTS

25. Please clarify which special-status species may be present within 1 mile of the project site, including the construction laydown area, and within 1000 feet of all project linears.

Response: This is a supplemental response to prior responses. During the wetland delineation surveys, the area along the gas line corridor was surveyed by biologists. Their field report is included as Attachment BR-25.

BACKGROUND

On page 8.2-7, in the special-status animals subsection, the AFC states that CNDDDB records indicate that the valley elderberry longhorn beetle (VELB) (state- and federally-threatened species) is likely to occur along the Cosumnes River and other rivers that the proposed gas pipeline may cross. However, the AFC does not contain VELB field survey results.

DATA REQUEST

29. If VELB surveys were conducted for the project site and all project linears, then please provide the survey results (field survey dates, names and qualifications of biologists, transect spacing, locations and size of elderberry shrubs). If VELB surveys were not conducted, then conduct the appropriate (USFWS protocol) surveys and provide the survey results.

Response: Valley Elderberry shrubs, which are the obligate host plant for VELB were noted wherever they occurred within the 125-foot corridor and adjacent areas. The results of those surveys are summarized in a technical memorandum included to this response as Attachment BR-29, and the locations are shown on the aerial photographs (Attachment BR-19). No attempt was made to identify elderberry shrubs in the Cosumnes corridor, which would be crossed by HDD. Not counting this area, 10 plants were

COSUMNES POWER PLANT (01-AFC-19)
DATA RESPONSES, SET 1H

observed in the corridor, located near the corner of Elk Grove Boulevard. These appeared to be planted recently and would not be directly affected by construction activity.

BACKGROUND

AFC Section 8.2.4.2 (page 8.2-10), states that although California tiger salamanders have been recorded within a mile of the site, none were observed. The AFC also states if any are disturbed within the project site or along the linear facilities, then it would be an insignificant portion of the population. However, the AFC does not contain California tiger salamander field survey results.

DATA REQUEST

30. If California tiger salamander surveys were conducted for the project site and all project linears, then please provide the survey results (field survey dates, names and qualifications of biologists, transect spacing, locations and size of elderberry shrubs). If California tiger salamander surveys were not conducted, then conduct the appropriate (DFG protocol) surveys and provide the survey results.

Response: CDFG protocol for CTS surveys calls for first aquatic larvae surveys between March 15 and April 15. These surveys are planned for completion during the first week of April.

BACKGROUND

In AFC Section 8.2.3.3, (page 8.2-7), it states that western burrowing owls often use ground squirrel burrows along railroad tracks and road cuts and that burrowing owls are likely to occur along the railroad tracks west of Franklin Boulevard and along Twin Cities Road. It also states that none were seen on or adjacent to the project site. However, the AFC does not contain western burrowing owl field survey results.

DATA REQUEST

31. If California tiger salamander [burrowing owl] surveys were conducted for the project site and all project linears, then please provide the survey results (field survey dates, names and qualifications of biologists, transect spacing, locations and size of elderberry shrubs). If California tiger salamander [burrowing owl] surveys were not conducted, then conduct the appropriate (DFG protocol) surveys and provide the survey results.

Response: The applicant notes that burrowing owls generally return to nesting grounds in the Central Valley in late February or March and thus surveys prior to March are probably not useful. Field surveyors have been instructed to observe and report any burrowing owls seen along the

COSUMNES POWER PLANT (01-AFC-19)
DATA RESPONSES, SET 1H

pipeline corridor, and note them on aerial figures. To date, one owl was observed near Simms road on the SRWTP buffer lands, but no nest was evident. There have been no other burrowing owls observed to date along the pipeline (see Attachment BR-25).

The CPP site has been visited numerous times since project initiation in approximately June of 2001. It was most recently observed on March 20, 2002 by EJ Koford, Senior Biologist. To date, no burrowing owls or burrowing owl nests or burrowing owl sign have been observed on the site or associated laydown area. We will continue to monitor and report if and when owls are observed.

Cosumnes Power Plant Natural Gas Supply Pipeline Wildlife Observations

PREPARED FOR: EJ Koford / SAC
PREPARED BY: Russell Huddleston / SAC
DATE: March 28, 2002

Introduction

This memorandum documents observation of wildlife species observed in the vicinity of the natural gas supply pipeline for the proposed Cosumnes Power Plant (CPP) project. The Sacramento Municipal Utility District (SMUD) proposes to develop a natural gas-fired generating facility south of the Rancho Seco Plant in Sacramento County, 25 miles southeast of the city of Sacramento. As part of the CPP, a new 24-inch-diameter pipeline will be constructed from Carson Ice-Gen Facility, approximately 20 miles northwest of the CPP. The proposed route is approximately 26 miles long. The natural gas supply line will be constructed using trenching, boring and horizontal directional drilling. Most of the route follows existing utility corridors, railroad and roadway right-of-ways. A portion of the pipeline will cross the Cosumnes River Nature Preserve.

Methods

Field surveys were conducted between March 1 and March 28, 2002. The primary objective of these surveys was to identify and delineate wetland features within the construction corridor of the natural gas pipeline. Protocol-level surveys for special status wildlife species were not conducted as part of this survey effort; however, wildlife species observed along the proposed alignment were noted. In addition, areas of potential habitat for special status species were noted during the wetland surveys. No aquatic sampling was conducted at this time, but the presence of aquatic invertebrates was noted in ponded areas where visual surveys were possible.

Results

Most of the wildlife observed during the survey were species commonly found in agricultural and grassland areas throughout the Sacramento Valley (Table 1).

Vernal pool tadpole shrimp (*Lepidurus packardii*) and California fairy shrimp (*Lindneriella californica*) were observed in a few of the seasonal wetland areas along the Union Pacific Railroad (UPRR) between Sims Road and the Franklin Boulevard crossing, and in one of the created vernal pools south of Elk Grove Boulevard. Aquatic invertebrates such as water

fleas, copepods, and seed shrimp were observed in many of the seasonal wetlands along the alignment. These areas could support special status crustaceans.

There was an unverified sighting of a giant garter snake (GGS) (*Thamnophis gigas*) by Gary Narlesky, a CH2M HILL surveyor, in an agricultural drainage ditch on the north side of Core Road. The snake was observed in an area with dense cattails and several inches of ponded water. Potential GGS habitat along the alignment includes agricultural drainages and ponds, the Cosumnes River, Badger Creek, Willow Creek, Laguna Creek and an unnamed tributary on the east side of Bruceville Road.

No California tiger salamanders (*Ambystoma californiense*) were observed. Small mammal burrows and other potential refugia was observed in the vicinity of several of the seasonal wetland areas. These areas were considered to provide potential habitat for this species.

No western pond turtles (*Clemmys marmorata marmorata*) have been observed in the vicinity of the project. Several agricultural ponds along the alignment provide suitable habitat for this species.

Several white tailed kites (*Elanus leucurus*) have been observed along the alignment. This species has been observed foraging in the annual grasslands along Franklin Boulevard, Arno Road, and in the agricultural fields around Bruceville Road. Suitable nest trees are present along the alignment.

While there are several reported nest locations within the vicinity of the proposed alignment, no Swainson's hawks (*Buteo swainsoni*) have been observed at this time. There are a number of large trees along the alignment that provide suitable nest locations for this species.

Burrowing owls (*Athene cunicularia*) have only been observed at a known nest location on the north side of Sims Road approximately 1,000 feet east of the proposed alignment. No ground squirrels have been observed and only a few large burrows were seen along the alignment. Potential nesting habitat was observed south of Rancho Seco Plant at the southeast corner of the proposed laydown area, where several burrows were present. To date no evidence of burrowing owls has been observed in the vicinity of the proposed alignment.

TABLE 1.
Species observed along the proposed natural gas pipeline alignment March 1 to March 28, 2002

Common Name	Scientific Name	Comments
Insects and Crustacea		
California fairy Shrimp	<i>Lindleriella californica</i>	Ponded areas along UPRR between Sims Road and Franklin Blvd Crossing
Tadpole Shrimp	<i>Lepidurus packardii</i>	Ponded areas along UPRR between Sims Road and Franklin Blvd Crossing
Water Fleas, Copepods, Seed Shrimp, Midge Larva, and Aquatic Beetles	<i>Cladocera, Copepoda, and Ostracoda, Diptera, and Coleoptera</i>	Common in many seasonal wetlands along the alignment
Mammals		
Black-Tailed Jackrabbit	<i>Lepus californicus</i>	Common in agricultural areas and grasslands along the alignment
Desert Cottontail	<i>Sylvilagus audobonii</i>	Few observed north of Dwight Road, Bufferlands
Muskrat	<i>Ondatra zibethicus</i>	Drainage ditch on north side of Sims Road, Bufferlands
River Otter	<i>Lutra canadensis</i>	Unnamed tributary east side of Bruceville Road
Pocket Gopher	<i>Thomomys bottae</i>	Observed tailings only in many annual grassland areas along alignment
Reptiles and Amphibians		
Giant Garter Snake	<i>Thamnophis gigas</i>	Unconfirmed siting by CH2M survey crew in agricultural canal north of Core Road
Gopher Snake	<i>Pituophis melanoleucus cantenifer</i>	Between Bilby and Core Road, in grassy area next to farmland
Western Fence Lizard	<i>Sceloporus occidentalis</i>	Grassland, near Rancho Seco
Bull Frog	<i>Rana catesbeiana</i>	Common in drainage ditches, canals, and ponds along the alignment
Birds		
Great Blue Heron	<i>Ardea herodias</i>	Cosumnes River Preserve
Great Egret	<i>Casmerodius albus</i>	Common along alignment
Mallard	<i>Anas platyrhynchos</i>	Common along alignment in open ditches and stock ponds, occasionally seasonal wetlands
Cinnamon Teal	<i>Anas cyanoptera</i>	Pond south of Core Road
Turkey Vulture	<i>Cathartes aura</i>	Common along Alignment
Osprey	<i>Pandion haliaetus</i>	Near Rancho Seco Facility
Northern Harrier	<i>Circus cyaneus</i>	Several locations along the alignment

TABLE 1.

Species observed along the proposed natural gas pipeline alignment March 1 to March 28, 2002

Common Name	Scientific Name	Comments
Rough-legged Hawk	<i>Buteo lagopus</i>	Twin Cities Road, near Laguna Creek Tributary
Red Tail Hawk	<i>Buteo jamaicensis</i>	Common along alignment
American Kestrel	<i>Falco sparverius</i>	Several locations along the alignment
White Tailed Kite	<i>Elanus caeruleus</i>	Several locations along the alignment
Ring necked Pheasant	<i>Phasianus colchicus</i>	Several locations along the alignment
California quail	<i>Callipepla californica</i>	Eschinger Road
Sandhill Crane	<i>Grus canadensis</i>	Eschinger Road
Killdeer	<i>Charadrius vociferus</i>	Several locations along alignment, often near seasonal wetlands
Rock Dove	<i>Columba livia</i>	Several Locations along alignment
Morning Dove	<i>Zenaida macroura</i>	Several locations along alignment
Burrowing Owl	<i>Athene cunicularia</i>	Sims Road, north of UPRR
Anna's Hummingbird	<i>Calypte anna</i>	Eschinger Road
Northern Flicker	<i>Colaptes auratus</i>	Eschinger Road
Horned Lark	<i>Eremophila alpestris</i>	Eschinger Road
Scrub Jay	<i>Aphelocoma coerulescens</i>	Several locations along alignment
Yellow billed Magpie	<i>Pica nutalli</i>	Several locations along alignment
American Crow	<i>Corvus brachyrhynchos</i>	Common along alignment
Marsh Wren	<i>Cistothorus palustris</i>	Several agricultural ditches along alignment
American Robin	<i>Turdus migratorius</i>	Several locations along alignment
Northern Mocking Bird	<i>Mimus polyglottos</i>	Twin Cities Road
European Starling	<i>Sturnus vulgaris</i>	Several locations along alignment
Yellow Rumped Warbler	<i>Dendroica coronata</i>	Eschinger Road
Savanna Sparrow	<i>Passerculus sandwichensis</i>	Several locations along alignment
White Crowned Sparrow	<i>Zonotrichia leucophrys</i>	Several locations along alignment
Red Winged Blackbird	<i>Agelaius phoeniceus</i>	Common along alignment, often in agricultural ditches with dense cattails
Western Meadowlark	<i>Sturnella neglecta</i>	Common along alignment
Brewers Blackbird	<i>Euphagus cyanocephalus</i>	Several locations along alignment
House Sparrow	<i>Passer domesticus</i>	Several locations along alignment
Song Sparrow	<i>Melospiza melodia</i>	Several locations along alignment

Cosumnes Power Plant Natural Gas Supply Line - Elderberry Shrub Locations

PREPARED FOR: EJ Koford / SAC
PREPARED BY: Russell Huddleston / SAC
DATE: March 28, 2002

Introduction

This memorandum documents observation of elderberry shrubs (*Sambucus* spp.) observed in the vicinity of the natural gas supply pipeline for the proposed Cosumnes Power Plant (CPP). The Sacramento Municipal Utility District (SMUD) proposes to develop a natural gas-fired generating facility (call Cosumnes Power Plant, CPP) south of the Rancho Seco Plant in Sacramento County, 25 miles southeast of the city of Sacramento. As part of the CPP, a new 24-inch-diameter natural gas pipeline will be constructed from Carson Ice-Gen Facility, approximately 20 miles northwest of the CPP. The proposed route is approximately 26 miles long. The natural gas supply line will be constructed using trenching, boring and horizontal directional drilling. Most of the route follows existing utility corridors, railroad and roadway right-of-ways. A portion of the pipeline will cross the Cosumnes River Nature Preserve.

The Valley elderberry longhorn beetle (VELB) (*Desmocerus californicus dimorphus*) is solely dependent on elderberry shrubs for reproduction and survival. Adult emergence and mating coincides with the peak flowering of elderberry plants, between April and May. During this time the adults feed exclusively on the foliage and flowers of the elderberry plant. After mating, the female deposits eggs in crevices and cracks in the bark. The eggs hatch within a few days and the larvae bore into the stem and trunks and begin feeding on the pith. The larva remain in the pith for 1 to 2 years. Immediately prior to emergence, a small hole is excavated in the outer bark, through which the adult beetle will exit. The oval shaped exit holes are approximately 3/16 of an inch wide, and are generally located between ground level and 6 to 10 feet above the ground surface, in the larger stems or the trunk. Dispersal patterns are unknown, and while adults are capable of flight, the range is likely limited.

Blue elderberry is the most common host plant for the VELB. This species is a common shrub in riparian areas, and may also occur in non-riparian habitats if there is sufficient moisture. The USFWS considers elderberry shrubs associated with a mixture of other riparian trees and shrubs to provide optimal habitat.

Due to naturally low populations levels and extensive loss of riparian habitats, the VELB was listed by the USFWS as threatened on August 8, 1980 (45 Federal Register 52807).

Methods

Field surveys were conducted between March 1 and March 28, 2002. The primary objective of these surveys was to identify and delineate wetland features within the construction corridor of the natural gas pipeline. During this survey, elderberry shrub locations within the construction corridor were noted and later surveyed with RTK GPS. Detailed stem counts and size measurements were not recorded, but stems were examined for evidence of beetles.

Results

A total of 10 elderberry shrubs were observed between Sims Road and the intersection of the Union Pacific Railroad (UPRR) and Franklin Boulevard. All of the shrubs in this area were growing on, or immediately adjacent to, the UPRR track bedding material. Three shrubs were present just south of Sims Road. A single shrub was observed between Laguna Boulevard and Elliot Ranch Road, and four shrubs were observed between Elk Grove and the intersection of the UPRR and Franklin Boulevard (see Attachment BR-19 for specific locations). No evidence of VELBs was observed on any of the stems.

Elderberry shrubs are also present within the riparian habitat of the Cosumnes River. Shrub locations in this area have not been surveyed as the gas line will be installed using horizontal directional drilling techniques and no impacts to this habitat are anticipated.

COSUMNES POWER PLANT (01-AFC-19)
DATA RESPONSES, SET 1H

Technical Area: Cultural Resources

CEC Author: Judy McKeehan

CPP Author: Jim Bard and Jim Sharpe

BACKGROUND

Confidential Appendix 8.3 C-2 discusses a record search summary for the Cosumnes Power Plant Project that was conducted through the California Historical Resources Information System (CHRIS). It does not specify which regional Archaeological Information Center(s) were consulted.

The confidential Appendix 8.3C does not include a complete list of technical reports for the resources identified for the Proposed Gas Line Alignment in Appendix 8.3 C-2.

DATA REQUEST

39. Please provide a plan to avoid (the plan should include, but not be limited to CA-SAC-93) all identified archaeological sites (both prehistoric and historic) within 200 feet and historic sites (built environment) within 100 feet of the plant site, linear routes, laydown, parking areas, and access roads. If it appears that a cultural resource cannot be avoided, provide a test plan for each archaeological resource and complete and provide the evaluation forms DPR 523, as appropriate, for historic resources, pursuant to CEQA Section 15064.5, (a), (3), (A)(B)(C) & (D).

Response: The proposed cultural resources mitigation plan is provided in Attachment CR-39.

Attachment CR-39
Draft

**Cultural Resources Mitigation Plan
Cosumnes Power Plant,
Sacramento County, California**

Prepared for
**SACRAMENTO MUNICIPAL
UTILITY DISTRICT (SMUD)**

March 29, 2002

Prepared by



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1.0 Introduction

1.1 Background

This mitigation plan addresses the cultural resources present at or near the proposed Cosumnes Power Plant (CPP) construction project area. As part of the initial Application for Certification (AFC), CH2MHILL prepared extensive documentation, part of which addresses project-related cultural resource concerns. Where appropriate, the AFC is referenced in this mitigation plan and extensive data provided therein is not repeated, but is included by reference.

Considerable recent legislation addresses the management of cultural resources during state and federal undertakings. Significant among them are the professional standards described in the National Park Service document *Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation* (National Park Service 1983). These guidelines delineate the disciplines and experience needed to meet these standards. This Mitigation Plan was prepared initially by Mr. Joe Nixon of Earth Tech who meets or exceeds these standards in archaeology and history and completed by CH2M HILL staff (Dr. Jim Bard and Mr. Jim Sharpe) who also meet or exceed these standards. Additional relevant laws, ordinances, regulations and standards can be found in Section 8.3.1 of the AFC.

1.2 Project Site Location, Project Description

The proposed project contains two parcels: 1) a 26-mile-long linear gas supply transmission line, and 2) the proposed site of CPP, located south of the former Rancho Seco Plant (RSP). The northern end of the linear segment begins just east of Morrison Creek at the Carson Ice-Gen site near a group of gas wells. It extends generally south through Franklin to Core Road. From there it turns generally east crossing Highway 99 and the Cosumnes River Preserve. On the eastern side of the preserve, it follows Arno Road, Laguna Road and Clay East Road to the CPP project area. When complete, the gas transmission line will provide a conduit to transmit natural gas from the Carson Ice-Gen site to CPP. Except for a few aboveground valve stations, the line will be situated beneath the ground surface.

2.0 Cultural Background

2.1 Local Prehistoric and Historic Sequence

The AFC notes that the prehistoric archaeological sequence in central California has been the subject of considerable professional debate. There has been deep sedimentation in the central region beginning in the Late Holocene epoch, sedimentation that may well bury older archaeological deposits, masking the true depth of human use of the region. Only a few sites have been found dating to more than about 5,000 years ago even though evidence is fairly certain that utilization dates back to approximately 12,000 years.

According to Moratto (1984), three general patterns in the local prehistoric sequence are used to describe early central California residents: the Windmill Pattern (2500 BC to 1000 BC); the Berkeley Pattern (1500 BC to 500 BC), and; the Augustine Pattern (AD 500 - forward). During the time period termed the Windmill Pattern, early residents hunted wild game and foraged for wild plant products. The archaeological record of the time echoes these activities including projectile points used to hunt land-based game in addition to fish hooks, spears, and a variety of fish remains, representing that part of the early diet. From the distribution of site types, it appears that populations used valley sites in the winter and moved into low hills during the summer. In the local area, the winter sites would be along the major valleys like the Cosumnes and its tributaries and the summer sites were situated in the surrounding foothills.

Adaptive strategies and resource exploitation changed in the Berkeley Pattern times. Manos and metates used to process wild seeds were slowly replaced with mortars and pestles more suited to processing acorns. Many sites of the period are located near water and contain shell midden deposits, attesting to the use of riverine resources. A continuance of hunting style tools argues for supplementing the diet through that activity as well. Locally, the major waterways would have been well suited to these riverine adapted peoples.

Sites from the Augustine Pattern times evidence a more advanced social organization. An emphasis was placed on acorns for subsistence and it appears that trade networks began to develop allowing transportation of goods over greater distances. Beads, harpoons, pipes, the bow and arrow, baked figurines, pottery and mortuary ritual items were characteristic artifacts of the peoples of this time period.

While this general time frame is used to understand local prehistory, there have been several attempts to refine it over time, including the Chartkoff and Chartkoff system from the mid-1980s and Frederickson's system from the mid-1990s (Chartkoff and Chartkoff 1984; Frederickson 1994).

2.2 Previous Local Investigations

Previous surveys along the proposed gas transmission line route have been completed. The areas surveyed are noted in confidential maps filed with the CEC staff as shown in Table 1.

TABLE 1
Summary of Previous Studies Performed Along the Gas Pipeline Route

Authors & date of report	Map Sheet #	Approximate mile posts
Maniery, Baker and Maniery, 1994 Heipel, 1990	1	0.00 (terminus a quo) to 2.6
Heipel, 1990 Peak and Associates, 1981, 1997	2	from 2.6 to 5.25
Peak and Associates, 1981, 1997 CH2M HILL, 2001	3	from 5.25 to 10.9
Nelson, 2000 Peak and Associates, 1979 CH2M HILL, 2001	4	from 10.9 to 16.6
Peak and Associates, 1982 CH2M HILL, 2001	5	from 16.6 to 21.6
Peak and Associates, 1982 Ritter, 1971 Flynn 1985 CH2M HILL, 2001	6	from 21.6 to 25.9 (terminus ad quem)

Additional work conducted at the proposed CPP location was reported in 2001 by Hart, Jenks and Dore. As a result of their work at this 220-acre tract, they reported two historic sites (CA-SAC-500H and 504H) and one prehistoric site (ARS-85-15-1) within the survey boundaries (Hart, Jenks and Dore, 2001) and they recommended further work at these locations if there became a need to determine CEQA significance.

2.3 Summary of Cultural Resources at the Project Area

The mitigation plan for cultural resources is based on various previous surveys focused on resources defined in two distinct locations: the CPP site and the proposed gas transmission line route. The resources defined based on work at CPP include: CA-SAC-500H, CA-SAC-504H, and ARS-85-15-1.

The second location includes resources defined based on previous work along the proposed gas transmission line route. As currently proposed, this line follows existing railroad and highway right of ways, numerous agricultural drainages, the channels of the Cosumnes River and Badger, Willow, Laguna and Hadselville Creeks, County and privately held lands, and several cultural resources including:

Elliott Ranch #1	Central California Traction Railroad
Elliott Ranch #2	Union Pacific Railroad
Knopfel Dairy	Historic Site CA-SAC-500H
Hadselville Creek Bridge	Historic Site CA-SAC-504H
Arno Townsite	Prehistoric Site CA-SAC-68
Arno School	Prehistoric Site CA-SAC-93
Hicksville Townsite	Prehistoric Site ARS-85-15-1
Hicksville Cemetery	Historic and Prehistoric Site
Western Pacific Railroad	CA-SAC-526-H/P-34-650
Southern Pacific Railroad	

3.0 Mitigation Plan

3.1 Introduction to the Mitigation Plan

At several locations, installation of the gas transmission line will require open excavation of a trench in which to construct the physical line. At some locations, excavations will include establishment of construction sites with features such as pads, pits, turnarounds, pump sites, piping, access roads, etc. In both instances, ground-disturbing activities will be undertaken, some to the depth of the line itself and others to a more shallow degree beneath the surface.

Cultural resources are defined as the remnants of human activity left behind after intentional actions. In many cases, the artifacts representing cultural resources are limited in distribution to the ground surface but in other cases, cultural materials may be buried; both types of sites reflect different kinds of human activities. In some instances, natural forces such as flooding can bury sites beneath the surface such that there are no surface indicators of the presence of deep cultural deposits.

Previous archaeological investigations along the proposed gas transmission line have been performed with the intention of defining cultural resources using methods limited to visual inspection of the ground surface. While this is a useful technique, it does not provide information about either the subsurface integrity of sites represented by surface scatters of cultural material or about sites that currently are completely buried beneath the ground surface. It does, however, provide the locations of sites represented on the ground surface.

3.2 Mitigation Elements

Ground disturbing activities proposed in connection with excavation and installation of the gas transmission line can disturb the soil matrices and the cultural deposits they contain, creating a negative impact on the integrity and on the information contained in the cultural resources. This is a necessary consequence of development. To protect the integrity of the resources and to ensure collection of the important information they may contain, this plan sets forth actions to be taken to mitigate the negative impacts that could result from the excavation and installation of the gas transmission line. Properly applied, these measures can reduce the significance of resources to an acceptable level through various mitigation measures. The mitigation plan for each resource is formulated based on the characteristics and significance of the cultural deposit and each plan contains a combination of specific elements. The specific elements used in this mitigation plan are explained below.

3.2.1 Avoidance

While there are many approaches to mitigation of negative effects on cultural resources, most cultural resource specialists agree on one premise: the preferred method of preservation is avoidance. This can be accomplished by keeping construction equipment, personnel, and support activities at a distance of at least 100 feet from known cultural

resources. When cultural resources are identified early in planning stages of a project, adequate avoidance measures can be built directly into operational plans and implemented as the project progresses.

In the event that construction or other improvements need to be closer than 100 feet from a cultural resource, temporary barriers can be established to prevent inadvertent disturbance of sensitive deposits. This is often accomplished with flagging, tape, fencing, rope, or some other type of restraining device. Once marked, however, instructions need to be conveyed to construction supervisors not to allow workers or equipment into or onto the demarcated areas.

The Knopfel Dairy at 4831 Bilby Road serves as an example. Dating to the 1920s, this Craftsman Bungalow style structure is approximately 800 feet from the proposed construction easement. The mitigation plan for this property involves only a single element: avoid the property during construction. Avoidance will ensure that the integrity of the cultural resource remains intact even though construction of the line will occur nearby.

3.2.2 Test Easement

Cultural resources are defined based on several variables, two of which are the horizontal and vertical distribution of artifacts on or within the site. Once a cultural resource has been defined (or redefined) within the proposed construction easement, a walk over inspection can provide much information about its horizontal characteristics, its distribution across the ground surface. Such a visual inspection, however, cannot provide data about the vertical dimensions of a site such as the presence of features (pits, hearths, wells, privies, basements, etc.) beneath the ground surface. Particularly in agricultural areas, the relationship between surface (horizontal) and subsurface (vertical) site elements is often obscured by years of agriculture. So, when a site is defined within the easement, that easement can be clearly delineated on the ground surface, and test units can be excavated into the soil matrix to assess the vertical integrity of a site. In many cases, testing reveals that there is no subsurface integrity at a particular site because: 1) there never were subsurface features, 2) the artifact scatter has been displaced from, and dragged beyond, subsurface features, or 3) agricultural activity has penetrated to a depth that has destroyed subsurface features. Where this is the case, the significance of the resource can be assessed to determine whether the information potential of the resource has been reduced to acceptable levels and whether a determination of “No Further Work” can be made. However, when testing identifies subsurface features, excavations generally proceed only after a site reassessment in light of that information.

3.2.3 Construction Monitoring

As discussed above, one of the local geologic activities that has been occurring since the late Holocene has been the accumulation of deposits in local waterways. With rains and erosion, soils from the upslope areas have washed into the valleys covering first the bedrock valley floors and later the early prehistoric occupations on the ancient floodplains and terraces. The presence of these buried sites has long been understood in archaeology and the Cosumnes River valley and its tributaries are not exceptions to this phenomenon.

Oftentimes these buried prehistoric resources have no surface manifestation whatsoever. One method used to identify such resources is trenching in high potential areas to inspect for buried deposits. This, however, is a labor and cost intensive process.

Another approach to identification of buried deposits is Archaeological Monitoring during construction. This is a fairly straightforward process. During the excavation phase of construction of the gas transmission line, an archaeologist on-site can monitor the trenching to watch for evidence of deposits in the trench walls and/or in the backfill.

The decision of where to monitor is generally based on two variables: local site density based on known surface scatters of resources and areas of favorable terrain. From the search of existing records and literature and from data recovered from physical field investigations, maps of the locations of reported sites can be prepared. Using these, archaeologists can identify areas in which the surface site density is high and where the probability of encountering buried sites is correspondingly high.

Also, by noting the locations of known sites, predictions can be made about the particular landforms on which resources may be likely to occur. If early prehistoric sites, for example, are routinely found on terrace formations along drainages, then areas of construction proposed to cross terrace formations may be likely to contain resources and, therefore, would be recommended for Archaeological Monitoring during excavations.

In recent decades another variable has emerged that influences the decision of where to monitor excavations prior to construction. With an increasing awareness of their resources, Native Americans have noted that sites important to them, including burials, can be located within construction easements. They argue that the identification of sites/places important to Native Americans requires someone familiar with their unique cultural heritage and this requires that their authorized representatives, or Native American Monitors, be on site, often in addition to the Archaeological Monitors. In the current project area, local Native American concerns are expressed by the Ione Band of the Miwok Tribe.

As discussed below, the current project contains one specific area that will require monitoring. Using the locations of known cultural resources and the presence of favorable landforms, CH2M HILL identified a "High Potential Area" (HPA) which is shown on Confidential Appendix 8.3DR). Later, Native American concerns were expressed in an area that stretches a little further east of the CH2M HILL HPA. The mitigation plan to address the sensitive area thus delineated involves Archaeological and/or Native American Monitoring of excavations prior to installation of the gas transmission line.

3.2.4 Specialized Mitigation Elements

In some cases, standard mitigation elements such as those above do not fit the unique characteristics of a particular resource. When this is the case, the mitigation plan needs to specify resource-specific activities designed to reduce the negative impact of the proposed construction.

The mitigation plan for the "High Probability Area" identified below is an example. In this case, no specific resources are defined, rather, based on a series of variables, it is reasonably thought that the probability of the occurrence of cultural resources in a particular area is high and that while surface manifestations of cultural resources are missing, other variables

argue for the presence of cultural deposits beneath the surface. To mitigate the effects of construction on these potential resources, a program of Archaeological/Native American Monitoring of excavations is developed.

3.2.5 No Further Work

The goal of a mitigation plan is to identify cultural resources, assess the actual impact that construction will have on those resources, and prepare mitigation elements to gather information, record, or otherwise ensure that data from the site is not lost as a result of construction activities. As the mitigation elements are executed at each resource, reassessments of the significance of the resource relative to data collected can be made until such time as it is determined that the information potential has been reduced to acceptable levels. When this mitigative stage is reached, then it can be determined that “No Further Work” is necessary at the resource.

The cultural resource represented by Elliott Ranch #1 is a good example. This windmill foundation was (is) part of the original Elliott Ranch Complex. It served as an integral element in providing water for ranch-related activities and was critical to the functioning of the complex. As detailed below, based on its distance from the proposed construction easement, the first element of the mitigation plan involves avoidance of the site by construction activities including excavation. By doing so, the significance of the resource is protected and the negative impact posed by construction has been reduced to an acceptable level; “no further work” is the second element of the mitigation plan.

3.3 Overview of the Mitigation Plan

The mitigation plan to follow contains three distinct sections. The first section discusses each of the three resources defined at the CPP project area as they are known in the existing literature. Using that information, as well location maps provided in the various existing documents, the relationship of each resource to the construction easement is considered. Based on all information, an assessment of the potential for construction to create a negative impact on the integrity of each resource is determined and individual elements of a mitigation plan, as detailed above, are presented.

The second section addresses cultural resources along the proposed gas transmission line. As at the CPP project area, existing information and site location maps from various sources are used to examine the relationship of each resource along the proposed gas line route. Again, based on all information, an assessment of the potential for the proposed construction to create a negative impact on the integrity of each resource is determined and individual elements of a mitigation plan are presented.

The third section details several elements of the mitigation plan. First, in several instances and for various reasons, there is a potential for construction to unearth archaeological/Native American materials or deposits that are not definable on the ground surface. Where the potential for this is high, Archaeological and/or Native American Monitoring of excavations during construction is an element of the mitigation plan. The duties and responsibilities of the Archaeological/Native American Monitor are discussed. Second, details of procedures to follow in the event of Inadvertent Discoveries are

presented. Third, procedures are provided for the discovery of human remains during excavation and construction of the gas transmission line.

Finally, to ensure that workers on the project are aware of the nature and sensitivity of cultural resources, the management plan contains a discussion of worker awareness and training.

3.3.1 Cosumnes Power Plant

Three sites have been previously identified in connection with a survey of the 220-acre area surrounding the CPP Plant Site (Hart, Jenks and Dore 2001). First, site CA-SAC-500H was defined on the basis of identification of historic remains (see Confidential Appendix 8.3C-1). It is irregularly shaped and measures approximately 550 feet across at its widest point. It is situated in an upland context among intermittent streams that drain westward into Hadselville Creek and eastward into an unknown drainage. It is in an area that at the time of the December investigations was fallow. Given its location, the first element of the mitigation plan for this cultural resource is to avoid it during construction. If this can be accomplished, construction will not cause a negative impact on the resource. Because of its proximity to the construction area and its situation within the Native American HPA, the second element of the mitigation plan involves Archaeological/Native American Monitoring during excavation and construction.

The second site, CA-SAC-504H, also is historic in character. Its location is shown on Figure 2 of Confidential Appendix 8.3C-1. It is in a rolling upland context near intermittent streams that feed Hadselville Creek. In December 2001, the land was fallow. Given its location away from the proposed plant construction site, the first element of the mitigation plan for this cultural resource is to avoid it during construction. If this can be accomplished, construction will not cause a negative impact on the resource. Given its location within the Archaeological/Native American HPA, the second element of the mitigation plan involves Archaeological/Native American Monitoring of the area during excavation prior to construction.

Third, site ARS-85-15-1 is a prehistoric site that is roughly circular and measures approximately 500 feet across at its widest point. As currently mapped, its location is shown in Figure 2 of Confidential Appendix 8.3C-1. It is also situated in a partially disturbed context near existing facilities of the former Rancho Seco Plant. It is in an upland area that was fallow at the time of the December 2001 visit to the area. Local drainage consists of intermittent streams that flow both east into an unknown drainage and west into Hadselville Creek.

It is not clear if the location of this resource was cultivated prior to installation of the Rancho Seco Plant (Map Sheet 6). If it was, then agricultural damage to the integrity of the cultural resource is likely and it is possible that the relatively large area of surface scatter represents a much smaller actual, original site area. Archaeological investigations of the resource conducted in 1985 lead to the determination that the prehistoric cultural resource did not possess the characteristics of significance. That, combined with the fact that it is located in an area that is beyond the construction easement of the proposed gas transmission line, prompts the first element of the mitigation plan to be avoidance of site ARS-85-15-1 during excavation and construction of the plant site (see Table 3). Given the site location within the

Archaeological/Native American HPA, the second element of the mitigation plan involves Archaeological/ Native American Monitoring during construction.

3.3.2 Proposed Gas Supply Corridor Construction Area

3.3.2.1 Elliot Ranch Complex

Elliott Ranch # 1 was defined based on the location of a windmill foundation with no associated artifacts (Map Sheet 1 of Confidential Appendix 8.3DR). Made of concrete, the base bears the inscription "1927" the ostensible date of its construction. At this point, CHRIS has not assigned a trinomial to this feature.

Elliott Ranch # 2 is the former ranch complex (Map Sheet 1 of Confidential Appendix 8.3DR). The original house and barracks were constructed in 1925 and the existing two houses, barracks, barns, outbuildings, corral and sheds are serving as the headquarters for the Elliott Cattle Ranch . Today it contains at least four structures. At this point, CHRIS has not assigned a trinomial to this feature.

Having suffered from years of use and wear, neither location is determined to be significant archaeologically and neither has been determined to meet CEQA guidelines (Maniery 1985). An historical architectural significance evaluation has not been completed (Maniery 1985). Given their distance from the proposed construction, the first element of the mitigation plan is to avoid these resources during excavation and construction of the gas transmission line. If this can be accomplished, the second element of the mitigation plan involves no further work.

3.3.2.2 Knopfel Dairy

The Knopfel Dairy complex is located at 4831 Bilby Road just north of the road and west of the Western Pacific RR grade (Map Sheet 2 of Confidential Appendix 8.3DR). Originally built in 1920, it consists of a residence and associated outbuildings. It is done in a Craftsman Bungalow style, toward the end of the period of popularity of that technique. The proposed gas transmission line is located approximately 800 feet to the west of the dairy. As such it is beyond the area of impact of construction. The first element of the mitigation plan for the Knopfel Dairy is to avoid the resource; the second element of the plan is no further work.

3.3.2.3 Prehistoric Site CA-SAC-68

Prehistoric site CA-SAC-68 is located in an area that at the time of the December 2001 field investigations was used agriculturally (Map Sheets 3 and 4 of Confidential Appendix 8.3DR). It is possible that modern use has damaged the site through repetitive cultivation and livestock practices. Situated along what may be an old channel of the Cosumnes River, the site also may have suffered from natural channel erosion over time.

As currently mapped, the site is approximately 700+ feet long (NE-SW) by 400 feet wide (NW-SE) at its widest point. Like other artifact scatters exposed to agricultural actions, the distribution of materials across the site surface may be skewed by equipment drag. If so, then the fairly broad scatter of materials depicted on the map may actually represent what once was a much smaller campsite. As recorded, the southwestern boundary of CA-SAC-68 is situated about 100 feet northeast of the proposed construction easement.

Because of the questionable accuracy of the mapping of the site, the long history of agricultural use and the uncertainty of its effects on the site, and its close proximity to the proposed easement, the actual effect on the resource as a result of proposed construction is unclear. The initial archaeological survey did not locate any cultural materials along the project route. Later, as a result of a December 1, 2001 ~~recent~~ field visit it was agreed to return to the field to walk portions of the proposed line near this site. The return visit was conducted on January 26, 2002. During this return visit, members from the California Energy Commission (CEC), Miwok Tribe, project personnel, and representatives from Tremaine and Associates walked the project route and confirmed the ground disturbance and negative indications of cultural materials on the surface.

Mitigation for CA-SAC-68 will be conducted in a phased approach using shovel testing and possibly excavation. Excavation will be determined by the presence/absence of the shovel testing. The first element of the mitigation plan involves shovel testing to determine presence/absence of subsurface cultural materials. Shovel testing will be conducted in portions of the easement that are within or near the southwestern boundary of the of the project route.

Shovel probes will be excavated until either two successive 10 cm levels of sterile soil is encountered beneath the plow zone or cultural deposits are encountered. Standard data gathering and recording techniques should be employed during these shovel probe excavations.

If cultural deposits are found, additional testing may be required. Such testing might employ hand excavation of 1 x 1 meter units. They would be excavated in arbitrary 10 cm levels until two successive sterile levels are encountered. Standard data gathering and recording techniques should be employed during these controlled excavations.

Because of the location of site CA-SAC-68 within the Archaeological HPA, the second element of the mitigation plan at this resource includes Archaeological Monitoring at the time of excavation in the vicinity of the site.

3.3.2.4 Prehistoric Site CA-SAC-93

Prehistoric site CA-SAC-93 is located on land used for agriculture. Initially, the site was plotted in three locations designated herein as the north, west and south locations (Map Sheet 4 of Confidential Appendix 8.3DR) east of the current channel of the Cosumnes River.

As a result of the December 1, 2001 field visit with members from the Miwok Tribe and project personnel it was agreed to return to the field to walk portions of the proposed line from Hicksville Cemetery to the Cosumnes River crossing, an area which includes all three possible locations of site CA-SAC-93. During the field visit cultural materials were observed in the agricultural field. It was decided to revisit the site at a later date and determine the spatial distribution and the overall condition of the site. Thus, the first mitigation plan element for CA-SAC-93 involved-redefining-the site to inspect and verify its location(s) and the accuracy of current maps, to assess the damage caused to the resource by agricultural and natural processes, and to assess the site extent and boundaries relative to proposed construction easement.

The site was located and updated by archaeologists from CH2M HILL on February 22, 2002. The spatial extent of the site appears to have been changed from the original site form probably due to agricultural activities in the area. At the present time the site covers approximately 13 acres with artifacts randomly scattered over the surface of the field. A DPR 523 site form was completed and provided to the CEC and CHRIS.

Because cultural materials were defined within the proposed 65-foot construction easement a second phase of mitigation for site CA-SAC-93 will be necessary. The second phase will involve presence/absence shovel testing to determine the vertical extent of the site.

Shovel testing would involve a shoveled test hole about every 50 feet along an area of about 4,000 feet within the proposed 65-foot construction easement. If subsurface cultural materials are discovered during the shovel testing, additional mitigation may be necessary that will probably include excavation. If necessary, the third phase of mitigation will include 1 x 1 meter hand excavated units at areas of artifact concentrations. The number and positioning of these units should be at the discretion of the archaeologist. Test units will be excavated in arbitrary 10 cm levels until two successive sterile soil are encountered beneath the plow zone. Standard data gathering and recording techniques should be employed during these controlled excavations.

3.3.2.5 Hicksville Townsite

A 1910 map illustrates the Hicksville townsite (Map Sheet 4 of Confidential Appendix 8.3DR). On current project maps there are five remaining structures at this location. Today most of this area is used agriculturally, the exceptions being residential lots, paved areas, utility line easements and the nearby cemetery. In its current location, the Hicksville townsite is beyond the proposed construction easement. If the easement is maintained throughout construction, the first element of the mitigation plan will involve avoiding the townsite. Because of its location within the combined Archaeological/ Native American HPA, the second element of the mitigation plan involves Archaeological/Native American Monitoring of excavations in the vicinity of the Hicksville Townsite.

3.3.2.6 Hicksville Cemetery

Established in 1949, today the Hicksville (a.k.a. Arno) Cemetery is administered by the Galt-Arno Cemetery District:

Galt-Arno Cemetery District
14180 Joy Drive
Galt, California 95632
Contact: Mel Jean (?), 1 909 745 2581

At the time of the December 1, 2001, field visit, Hicksville Cemetery was fenced with cyclone fencing. Portions of the fencing appeared to be relatively new suggesting that the existing boundaries may not reflect the original boundaries. In addition, very new fencing present at the southeast corner of the cemetery delineates the new boundaries established with the recent expansion of the cemetery (see below). Using the rough scale on the USGS reprints, the boundaries of the cemetery are indicated to be approximately 500 ft N-S by 250 ft E-W (Map Sheet 4).

Agricultural fields stretch to the west, north and east of the cemetery. County-owned Arno Road is situated to the south side of the plot. A fence on the south perimeter of the cemetery appears to mark the change in property ownership from County (road easement) to private (cemetery). In good condition at the time of this visit, Arno Road appears to be well maintained as an asphalt two-lane feature.

It is probable that the early Arno Road passed by the early Hicksville Cemetery. The proximity of the original easement width to the original cemetery, however, cannot be determined in the field and so the southern extent of the cemetery relative to the current easement is not clear. It is possible that modern road construction impinged on southern portions of the cemetery and that burials may extend near or to the edge of the current road. To facilitate drainage from the road in its current condition, ditches have been cut on either side (north and south) of the road, oriented parallel to it. Looking east from the parking lot just outside the southern cemetery fence, these ditch cuts appear to have been at least two to three feet deep. Covered in deep, thick grass when visited, it was not possible to see the ground surface to inspect for possible evidence of features in the soils.

Inside the fence marking the current boundary of the cemetery, toward its north end are upright markers of earlier graves scattered among mature trees that probably date to the origin of the plot. Near the southern (Arno Road) end there are some additional markers that are flat with the ground surface. Earlier graves are near the center of the cemetery with later burials expanding outward. The density and locations of burials within the cemetery are not accurately known.

At some point, Native Americans working on nearby ranches buried some of their ancestors in the cemetery as well. One of the participants in the December 1, 2001, field inspection, Randy Yonemura, made it known that he had ancestors buried there. The specific locations of these burials as well as their number are not known. Nor is it understood whether the Native American burials are mixed among other interments or if they are grouped separately. It is possible that they are beyond the cemetery as currently marked. To address this issue and hopefully to protect burials on the periphery of the existing cemetery, the boundaries of the cemetery have been extended approximately 25 feet to the west, north, and east. It was not extended to the south because of the easement of County owned Arno Road. According to Mr. Yonemura, during installation of the new fence, burials were encountered on the north and east sides of the cemetery reinforcing the conclusion that additional burials might still exist on the south side of the cemetery fence beneath a gravel parking lot area. There was concern that if the gas transmission line is planned to go through this area, burials may be encountered. Available construction options at the cemetery location discussed include:

1. Non-invasive subsurface archaeological investigations to determine burial locations, or
2. Invasive subsurface archaeological investigations to determine burial locations, or
3. Directional boring and installation of the line beneath the cemetery and the burials it contains, or
4. Relocating the line away from the cemetery and the burials it contains.

3.3.2.6.1 Mitigation Plan for the Hicksville Cemetery

Subsurface Investigations. The purpose of this element of the mitigation plan is to identify specific locations where the greatest potential for burials may exist using invasive archaeological techniques. In particular, the goal is to determine whether potential burials are located in the proposed construction easement for the gas transmission line.

After considering several options that included ground penetrating radar, directional drilling, probing, relocation of the pipeline, and shovel testing, it was decided the most reliable technique to determine presence/absence of possible burials was to use a backhoe. In order to further reduce the potential of encountering burials the route was recently relocated from the north side of Arno Road to the south side. A backhoe will be used to excavate along a predetermined centerline over a distance of approximately 400 feet on the south side of Arno Road. A flat blade will be attached to the edge of the bucket to ensure a smooth and controllable removal of soils. Levels will be approximately 10 cm.. Each bucket and exposed subsurface soils will be inspected by archaeologists and Native American monitors.

The depth of excavations would be determined in the field. It can be envisioned that prior disturbance of the upper soils may have occurred in connection with agricultural use prior to the establishment of the cemetery (1949); construction of the road, drainage ditches, shoulders or other road related features; installation or removal of fencing, or; other ground disturbing activities. If this is the case, then excavators will need to determine the nature and depth of the disturbance and the depth to which disturbed overburden would need to be removed before encountering undisturbed subsoils. On reaching undisturbed soils, excavators would watch for changes in soil color or texture or for other indications that soils within the units had been previously disturbed, as would be the case if graves were previously excavated at that location.

Such excavations would continue either the length of the proposed line or until a positive indication of burials was encountered. If no burials are encountered then the specific line location could be marked for future excavation/construction. If burials are encountered then work would cease and the steps detailed in the "Discoveries of Human Remains" section below would be implemented.

3.3.2.6.2 Summary of the Mitigation Plan for Hicksville Cemetery

To summarize, evidence strongly suggests both Anglo and Native American burials are present within or near the Hicksville Cemetery. Indirect evidence further suggests that there have been burials located beyond the cemetery boundaries and that there may still be interments between the southern cemetery boundary as defined today and the easement along Arno Road. Combined, these factors make excavation for, and installation of, the proposed gas transmission line problematic requiring mitigation. Recently, the line was relocated and a backhoe will be used to trench for the presence/absence of burials.

Should burials be encountered, implementation of the procedures detailed in the "Discoveries of Human Remains" section below will be implemented.

3.3.2.7 Arno School Site

The site of Arno School lies east of Hicksville Cemetery (Map Sheet 4 of Confidential Appendix 8.3DR). It is situated in the moderately dissected uplands above and to the south of the combined drainages of Cosumnes River and Badger Creek. On the level uplands and

on slopes where the grade is shallow, agriculture is the primary activity. Although situated just beyond the proposed construction area, it is possible that features associated with the school could be encountered during excavations for pipeline installation. Based on that possibility, the first element of the mitigation plan for Arno School includes avoidance of the property during construction. Because of the location of the Arno School in the combined Archaeological/Native American HPA, the second element of the mitigation plan involves Archaeological/Native American Monitoring of construction of nearby segment so the proposed gas transmission line.

3.3.2.8 Arno Townsite

The Arno Townsite is shown on Map Sheet 4 of Confidential Appendix 8.3DR. As currently mapped it is roughly circular measuring approximately 400 feet across. It is in a floodplain context. Located within ca. 200 feet of the proposed easement, it is in an area where construction may encounter hollow features (privies, wells, cisterns, cellars, etc.) associated with the original townsite. Given this possibility, the first element of the mitigation plan for the Arno townsite involves avoidance during construction. Because of the location of the Arno Townsite in the combined Archaeological/Native American HPA, the second element of the mitigation plan involves Archaeological Monitoring of the resource while excavations are underway.

3.3.2.9 Hadselville Creek Bridge, 24-CO-276

The Hadselville Creek Bridge provides access across the creek along the north-south portion of Clay Station Road approximately one half mile east of Clay (near milepost 23.93) (Map Sheet 6 of Confidential Appendix 8.3DR). About 600 feet to the south the topography rises to form the hills on the rim of the adjacent uplands. The bridge was built in 1960 and recent investigations determined that the bridge is not NRHP eligible (See Attachment CR-32, Data Response Set 1C).

The proposed line at this location follows an existing roadway that passes between the Hadselville Creek Bridge and the uplands to the south. At this location the line is situated 300+ feet south of the bridge. Situated as it is, the first element of the mitigation plan for the bridge involves avoidance of the resource during excavation and construction. If this can be accomplished then the second element of the mitigation plan involves no further work.

3.3.2.10 Western Pacific Railroad

As currently proposed, the gas transmission line will follow the existing Western Pacific Railroad grade from its beginning at milepost 0.00 at the Carson Ice-Gen Plant to milepost 6.24 where line leaves the railroad grade and turns east onto Core Road (Map Sheets 1, 2, and 3 of Confidential Appendix 8.3DR). Along this stretch of the RR grade, the line will parallel the RR ROW. Excavation and installation of the gas transmission line in this area will not have an effect on cultural features of the existing track or grade. Even so, it is possible that excavations could unearth artifacts related to the original construction of the cultural resource. Given that possibility, the first element of mitigation plan for this segment of the Western Pacific Railroad includes Archaeological Monitoring of construction-related excavations.

3.3.2.11 Southern Pacific Railroad

The easement for the proposed gas transmission line will cross the existing SPRR grade southeast of near milepost 13.28 (Map Sheet 4 of Confidential Appendix 8.3DR). The proposed construction technique is horizontal directional drilling as indicated on the project maps. As currently planned, this boring will begin at milepost 13.28 and continue to milepost 13.61. In its final configuration, the gas transmission line will cross the RR ROW beneath the existing tracks and grade and will have no effect on the cultural resource. To achieve this, however, will require a construction site with necessary features such as pads, pits, turnarounds, pump sites, piping, etc. Construction of these support facilities at either end of the directional boring operation may disturb existing cultural resources buried beneath the surface. Because of the location of the SPRR crossing in the combined Archaeological/Native American HPA, the first element of the mitigation plan involves Archaeological/Native American Monitoring during excavations and site preparation.

3.3.2.12 Central California Traction Railroad

The proposed gas transmission line will cross the Central California Traction Railroad (CCTR) grade at milepost 18.73 (Map Sheet 5 of Confidential Appendix 8.3DR). The crossing will be at a 90-degree angle to the existing cultural resource and excavation and installation will be done using a technique labeled "Valensin Road/Railroad Bore" on project maps. To achieve this, however, will require a construction site with necessary features such as pads, pits, turnarounds, pump sites, piping, etc. Construction of these support facilities at either end of the crossing operation may disturb existing cultural resources buried beneath the surface. Because of the location of the CCTR in the combined Archaeological/Native American HPA, first element of the mitigation plan at this location involves Archaeological/Native American Monitoring during excavations and site preparation.

3.3.2.13 Union Pacific Railroad

From milepost 21.58 to milepost 23.93 the proposed gas transmission line will follow the ROW of the Union Pacific Railroad (Map Sheet 6 of Confidential Appendix 8.3DR). Excavation and installation of the gas transmission line in this area will be done using a technique labeled "Direct Bury Railroad Construction" on project maps. Excavation for and installation of the proposed gas transmission line will not have an effect on cultural features of the existing track or grade. Even so, it is possible that excavations could unearth artifacts related to the original construction of the cultural resource. Because of the location of the Union Pacific Railroad in the combined Archaeological/Native American HPA, the first element of the mitigation plan includes Archaeological/Native American Monitoring of excavations prior to installation.

3.3.2.14 CA-SAC-526-H (P-34-650)

During recent investigations, CH2M HILL's archaeologists identified an additional cultural resource with two components (Sharpe 2001). The first component was historic and designated as site CA-SAC-526-H. The second component identified was prehistoric and designated site P-34-650 (Map Sheet 4 of Confidential Appendix 8.3DR). The prehistoric component of this site consists of a single ground stone chopper found in an existing dirt roadway. The historic component, found in the same area, is represented by several

artifacts suggesting agricultural and/or domestic activities. CH2M HILL's archaeologists speculated that the historic component may once have been associated with the Arno Townsite.

Site CA-SAC-526-H/P-34-650 is on the west side of the proposed construction easement and adjacent to the centerline of it. As mapped, the site is circular and measures approximately 200 feet across. At an elevation of 35 feet AMSL it is 5 feet above the lowest part of the adjacent floodplain and about 8-12 feet below the upland elevations to the southeast. The nearest waterway is the channel of Badger Creek. The land surrounding the site is characterized by shallow slopes and is used agriculturally. While this activity may have had an impact on the integrity of the site, it is at an elevation away from the natural destructive forces of channel action and erosion.

The particular site location is adjacent to the proposed construction easement. Very near this location, a NW-SE directional bore will emerge from the ground surface and from this point to the southeast, trenching will be the method of construction. As such, the site is positioned such that ground disturbing activities associated with installation of the line will have a negative impact on its integrity.

In this case, a recent archaeological field survey defined prehistoric materials on the surface of site P-34-650 and using that information, a site redefinition is not necessary. Given the presence of prehistoric materials, the first element of the mitigation plan includes testing of the resource within the proposed construction easement. This would involve locating the scatter of cultural materials within the proposed 65-foot construction easement across the site, or approximately 200 feet. Within this 65 x 200-foot area, a visual inspection should be undertaken and the scatter of artifacts across the surface noted, possibly using flagging.

Once the scatter is defined shovel testing will be conducted to determine presence/absence of subsurface deposits. Shovel testing will involve a shoveled test hole about every 50 feet paralleling the roadway both N/S and E/W for about 300 feet in each direction. If subsurface cultural materials are discovered during the shovel testing, additional mitigation may be necessary that will probably include excavation. If necessary, the third phase of mitigation will include 1 x 1 meter hand excavated test units at areas of artifact concentrations. The number and positioning of these units will be at the discretion of the archaeologist. Test units will be excavated in arbitrary 10 cm levels until two successive sterile layers are encountered. Standard data gathering and recording techniques should be employed during these controlled excavations.

3.3.2.15 High Probability Areas

Based on their review of existing literature and on field investigations, cultural resource specialists at CH2M HILL defined "Archaeological High Probability Areas" (CH2M HILL 2001:8.3-22-23) using two variables. First, a high probability area (HPA) can be identified by noting areas with a high concentration of known and previously reported sites, such as historic townsites, cemeteries, schools, ranches, etc. Second, areas of favorable terrain also can qualify as HPAs. Such landforms might include key locations such as the confluences of creeks and rivers, terrace formations, overlooks or other areas potentially attractive to former residents, either historically or prehistorically. Using these variables, CH2M Hill defined an HPA as shown in Confidential Appendix 8.3DR.

Additional information on HPAs was noted by the representatives of the Miwok Tribe at the December 1, 2001, field meeting. A copy of the notes from the meeting has been provided to the CEC staff.

Based on the variables of the presence of known sites/favorable landforms, CH2M HILL defined an HPA that stretches through a large portion of the pipeline (see of Confidential Appendix 8.3DR). Based on Native American and concerns, a sensitive area was defined. Extending the sensitive area defined on Native American areas slightly to the west and extending the CH2M HILL HPA slightly to the east yields an overlapping area of concern. The first element of the mitigation plan to address the HPA thus delineated involves Archaeological and/or Native American Monitoring of excavations prior to installation of the gas transmission line. The previously identified sites within this combined HPA include:

TABLE 2
Sites Within the Combined High Probability Area

Historic Resource	Prehistoric Resource
Southern Pacific RR	CA-SAC-68
Arno Townsite	CA-SAC-93
Hicksville Townsite	CA-SAC-526-H/P-34-650*
Hicksville Cemetery	
Arno School	
Central California Traction RR	
Union Pacific Railroad	

* Resource contains both a prehistoric and an historic component.

Table 3 provides a summary of the various mitigation plan recommendations for each of the resource areas.

3.4 Monitoring

3.4.1 Archaeological Monitoring

In designated areas, an Archaeological Monitor will be required to identify any cultural resources that might be exposed by excavation, construction, or other related activities. The requirements for an Archaeological Monitor are described in the AFC as:

- A BA degree archaeology, anthropology or related field
- Five years experience conducting archaeological field projects
- Experience in evaluating site significance, consultation with regulatory agencies, site plan evaluation and mitigation planning

TABLE 3
Resource Identification Grouped by Mitigation Plan Elements

Plan Element/ Resource Identification	Site Description	Mitigation Plan Element	Comment
AVOID, NO FURTHER WORK			
Elliot Ranch #1	windmill foundation	avoid, no further work	
Elliot Ranch # 2	ranch complex	avoid, no further work	
Knopfel Dairy	4831 Bilby	avoid, no further work	
Hadselville Creek Bridge	historic bridge	avoid, no further work	
TEST EASEMENT, MONITOR CONSTRUCTION			
CA-SAC-68	prehistoric "mound"	redefine, test easement, Arch* monitor construction	
CA-SAC-93	prehistoric village site	redefine, test easement, Arch/NA* monitor construction	
CA-SAC-526-H/P-34-650	historic/prehistoric	test easement, Arch/NA monitor construction	
AVOID, MONITOR CONSTRUCTION			
Arno Townsite	historic townsite	avoid, Arch/NA monitor construction	
Hicksville Townsite	historic townsite	avoid, Arch/NA monitor construction	
Arno School Site	historic school site	avoid, Arch/NA monitor construction	
CA-SAC-500H	historic	avoid, Arch/NA monitor construction	
CA-SAC-504H	historic	avoid, Arch/NA monitor construction	
ARS 85-15-1	prehistoric	avoid, Arch/NA monitor construction	
MONITOR CONSTRUCTION			
Western Pacific RR	historic railroad	Arch monitor construction	construction alongside
Southern Pacific RR	historic railroad	Arch/NA monitor construction	construction beneath
Cent. California Traction RR	historic railroad	Arch/NA monitor construction	construction beneath
Union Pacific RR	historic railroad	Arch/NA monitor construction	construction alongside
SPECIALIZED MITIGATION ELEMENTS			
Hicksville Cemetery	historic cemetery	1. non-invasive archaeology; 2. invasive subsurface testing; 3. boring beneath cemetery; 4. reroute line to south;	preferred option
High Probability Areas	historic/prehistoric	Arch/NA monitor construction	
Laydown Areas	historic	Arch/NA monitor construction	

*Arch = Archaeological; NA = Native American

3.4.2 Native American Monitoring

In addition to the Archaeological Monitor, a qualified Native American Monitor may also be required at designated areas to identify any resources or materials that are of particular cultural concern. The qualifications of the Native American Monitor are at the discretion of the Native American groups who express an interest in the project and who supply monitoring personnel.

3.4.3 Direct Excavation Monitoring

The Archaeological/Native American Monitor should be present at all times that excavations are being made and should watch the trenching proper and the backdirt piles for evidence of archaeological/Native American materials. For future use, the

Archaeological/Native American Monitor should keep notes on excavations in areas designated as sensitive, documenting the presence/absence of materials in each area. These notes should be organized and compiled daily.

If the Archaeological/Native American Monitor identifies cultural materials in excavations, the monitor should immediately notify on-site project officials. The project officials should immediately stop excavation/construction activities within 50 feet of the discovery, move equipment and personnel away from the discovery, secure the discovery by flagging, rope, tape, barricades, or other means, and notify project officials of the discovery. Excavation/construction may continue at locations beyond the barrier marking the discovery. Next, the Archaeological/Native American Monitor shall inspect the exposure to evaluate whether it is significant or not.

If the Archaeological/Native American Monitor determines that the exposure does not contain significant deposits, the monitor should notify on-site project officials to remove the protective flagging, tape, or other restraining device and resume excavation and/or construction. The Archaeological/Native American Monitor should include observations in field notes explaining the location, nature, and contents of the exposure complete with reasons why it was determined not to be significant. Photographic documentation is encouraged.

If the Archaeological/Native American Monitor determines that the exposure of archaeological/Native American material is significant, then the on-site project officials should be notified and should cease operations and take measures as above. They, in turn, should notify project officials who should notify appropriate CEC staff, SHPO, project archaeologist, etc. to initiate an investigation of the archaeological/Native American materials. At this time, the Archaeological/Native American Monitor should begin to complete standard recording forms including the DPR 523; photographic documentation is encouraged.

4.0 Find-Specific Mitigation Plan

The Archaeological/Native American Monitor, in consultation with CEC, SHPO, project archaeologist, etc. should prepare a Mitigation Plan for the exposed Archaeological/ Native American resource. This mitigation plan will need to be tailored to the resource, its location, condition, and characteristics. When an acceptable plan is complete, its elements should be executed as rapidly as possible to allow excavation/construction to continue.

5.0 Curation

If cultural/Native American materials are discovered and recovered as a result of excavation and construction, the Archaeological/Native American Monitor and/or the project archaeologist will ensure that archaeological materials transported and stored at an approved curation facility that meets standards specified in 36 CFR Part 79. If Native American materials are recovered during monitoring or mitigation, the Native American Monitor will ensure the interested Native American groups are notified of the presence of the materials and are afforded an opportunity to comment on their disposition. In the absence of Native American input, the materials will be curated at an acceptable archaeological curation facility.

6.0 Reporting and Training

Following monitoring of identified sensitive areas along the construction easement and following implementation of any mitigation plan developed in response to discoveries of Archaeological/Native American materials, the Archaeological/Native American Monitor shall prepare a written report of investigations. This report shall include field notes, observations on significant of non-significant resources encountered, photographs, or other data. It should justify and decisions made in the field regarding site significance and should clearly explain all mitigation plan elements used and demonstrate their efficiency in reducing the threshold of significance. Following review by the sponsor and CEC, this report should be filed at the curation facility with any recovered artifacts and at the Information Center.

6.1 Inadvertent Discoveries

Despite the record searching, field surveying, testing, monitoring, or other actions taken to ensure that all cultural resources are located prior to construction, there still remains the possibility that undiscovered, buried cultural resources might be encountered during construction in the absence of an Archaeological/Native American Monitor. These 'inadvertent discoveries' can appear unexpectedly in construction trenches or in back dirt piles and, once discovered, they require special treatment as described below.

6.1.1 Discoveries of Human Remains

Local Native American sources relate that in historic times, Native American residents of the area interred remains of their ancestors in the Hicksville Cemetery. In the discussion above, it is noted that the boundaries of the cemetery as marked today probably do not conform to the original boundaries of the plot. In fact, researchers were told that during modern construction of the existing perimeter fence, remains were encountered beyond the old cemetery boundary markers. Native American interviewees also noted that there are additional burials in the hills between Hicksville Cemetery and the CPP. Given the unsure boundaries of the combined Anglo/Native American Hicksville Cemetery and the possible presence of Native American burials in surrounding territory, the possibility of encountering human remains – whether Anglo or Native American – is high.

If human remains are unearthed, on-site project officials will immediately stop excavation/construction activities within 50 feet of the discovery, move equipment and personnel away from the discovery, secure the discovery by flagging, tape, or other means, and notify project officials of the discovery. Excavation/construction may continue at locations beyond the barrier marking the discovery. The California Health and Safety Code (Sec. 7050.5) is very specific about procedures to follow in the event human remains are encountered. In that event, project officials are required to contact the Sacramento County Coroner:

Sacramento County Coroner's Office
4800 Broadway, Suite 100
Sacramento, Ca 95820
Ph 1 916 874 9320
Fax 1 916 874 9257
<http://coroner/saccounty.net/>

Project officials must alert the Coroner of the discovery and provide directions to reach the site. The Coroner will examine the remains and make a determination whether or not they are Native American in origin. In the event that the remains are NOT Native American in origin, the project archaeologist and the consulting parties such as the CEC, SHPO, Sacramento County, etc., shall prepare a plan for excavation and disposition of the remains. This could involve reburial of the remains within the Hicksville Cemetery. All efforts should be taken to complete the excavation plan as quickly as possible so that construction can resume.

If the remains ARE Native American in origin, the Coroner will notify the Native American Heritage Commission (NAHC) of the discovery.

Native American Heritage Commission
915 Capitol Mall, Room 364
Sacramento, Ca 95814
Ph 1 916 653 4082
nahc@pacbell.net

The NAHC, per Public Resources Code (Sec. 5097.98), will determine and notify the Most Likely Descendant (MLD) of the remains of the incident. The NAHC will then request that the MLD inspect the discovery and provide recommendations for treatment or disposal of the remains. Project staff and/or the project archaeologist/monitor will assist the MLD in execution of treatment or disposal.

6.2 Worker Cultural Awareness Training

Construction crews and supervisors are seldom trained in the legal and cultural importance of cultural resources. Prior to initiation of construction activities, the Archaeological/Native American Monitor will conduct a short training session with construction supervisory personnel to make them aware of (at least):

- Brief prehistory, history, and ethnohistory of the region
- The legal and cultural importance of cultural/Native American resources
- The consequences of inadvertently disturbing the integrity of cultural/Native American resources
- How to identify cultural/Native American resources in the event that they are exposed
- Who to notify in the event of exposure of cultural/Native American resources during excavation/construction
- Procedures to follow on exposure of cultural/Native American resources

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