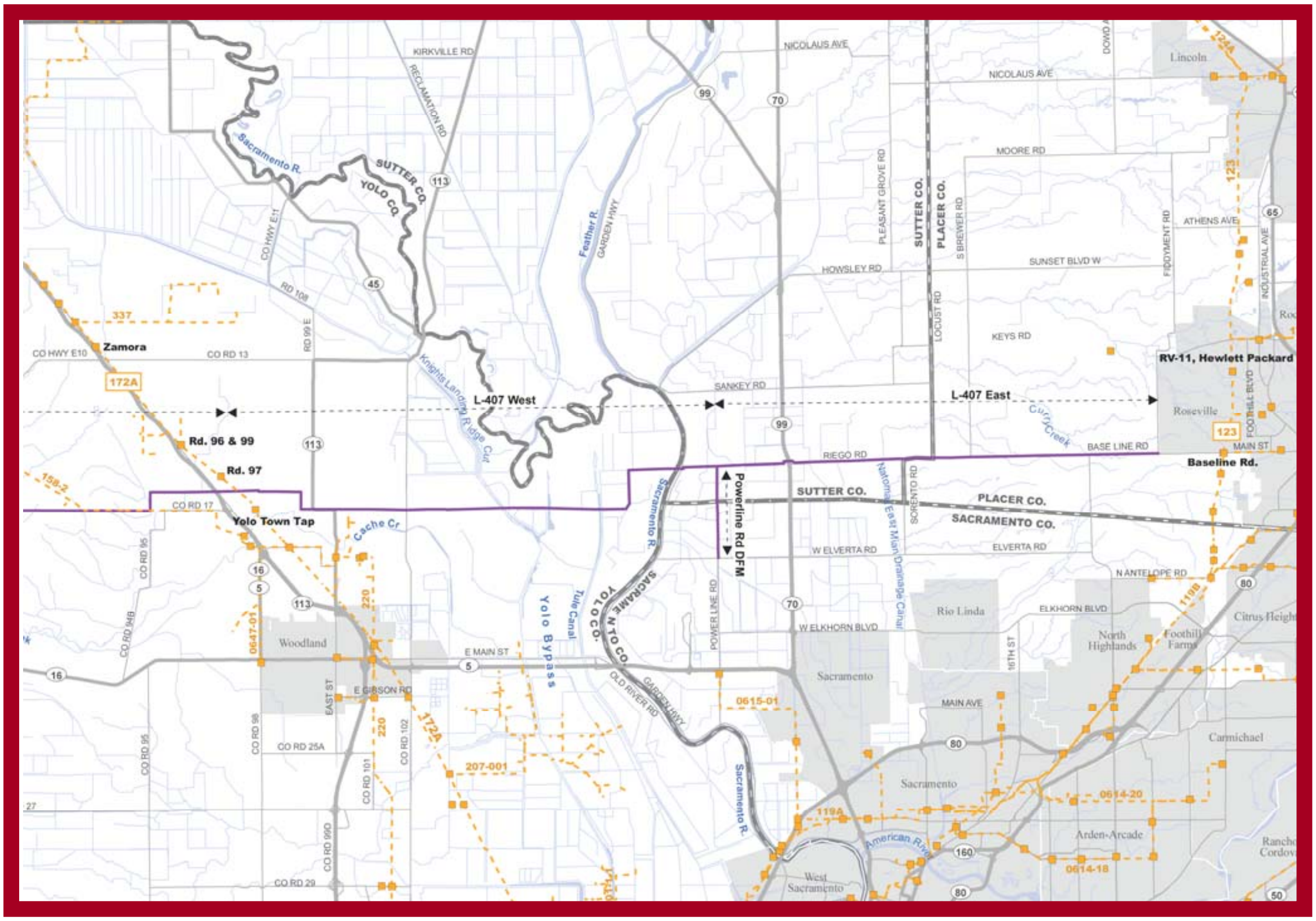

PG&E Line 406/407 Natural Gas Pipeline Project
Draft Environmental Impact Report

State Clearinghouse No.: 2007062091

California State Lands Commission ▪ April 29, 2009

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Draft Environmental Impact Report
for PG&E Line 406/407 Natural Gas Pipeline Project
Yolo County, Sacramento County, Sutter County, and Placer County, California
State Clearinghouse No. 2007062091
California State Lands Commission EIR No. 740

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April 29, 2009

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EXECUTIVE SUMMARY

PROJECT OBJECTIVES, PURPOSE, AND NEED

Pacific Gas and Electric Company (PG&E) is proposing to construct and operate multiple natural gas transmission pipelines that would ultimately cross California's Central Valley in the counties of Yolo, Sutter, Sacramento, and Placer. The proposed Project would specifically involve the construction and operation of three new transmission pipelines: Line 406, Line 407 (West and East), and the Powerline Road Distribution Feeder Main (DFM). The Project would also include the construction of six aboveground facilities. Fully constructed, the pipelines would span the lower Sacramento Valley.

PG&E identified the following objectives for the proposed Line 406/407 Natural Gas Pipeline Project (Project):

- Provide greater capacity and service reliability to the existing gas transmission and distribution pipeline system while minimizing costs to PG&E's customers;
- Extend natural gas service to planned residential and commercial developments in Placer, Sutter, and Sacramento counties;
- Install Project facilities in a safe, efficient, environmentally sensitive, and cost-effective manner; and
- Locate the pipeline to minimize the potential of environmental impacts resulting from damage by outside sources.

DESCRIPTION OF PROPOSED PROJECT

The Project would involve construction of approximately 40 miles of new pipeline, as well as aboveground features. At its western terminus, the Project would add a new major connection point to Lines 400 and 401, the Capay Metering Station, located approximately 15 miles south of the Buckeye Pressure Limiting Station in Yolo County. From this connection point, the Project would construct a large-diameter (30-inch) transmission pipeline across the lower Sacramento Valley, essentially bisecting the existing pipeline loop system. The Project would connect to existing Line 172 and Line 123 to further reinforce the reliability of the region's natural gas system by providing a second large-diameter connection point between Lines 400 and 401 and existing pipelines serving the area.

Six fenced, aboveground pressure limiting, pressure regulating, metering, and main line valve stations would be constructed along the Project alignment to ensure that proper pressures are maintained in the transmission system and to reduce the pressure of the gas before delivering it to the distribution pipeline system. These facilities would also require the installation of valve extensions, actuators, valve hand wheels, risers, meters, Supervisory Control and Data Acquisition (SCADA) pipeline system monitoring equipment, and other appurtenances within and adjacent to the stations.

PG&E proposes a 100-foot-wide temporary use area (TUA) for general pipeline trenching consisting of a 50-foot wide permanent easement and a 50-foot wide temporary construction easement (TCE) to accommodate the equipment needed to lay the 30-inch-diameter pipe in a 3.5- to 5-foot-wide trench, an equipment travel lane, and a spoil pile for the excavated soils A 60-foot wide TUA would be used for construction in constricted workspaces and would require that excavated soil be transported to an adjacent TUA. Each of the twelve proposed Horizontal Directional Drilling (HDD) locations would require an additional 18,750-square-foot temporary use area for equipment that would be set up at the proposed entry and exit points. PG&E proposes to obtain a 50-foot wide permanent easement over the proposed alignment. Restrictions in the easement would prohibit the planting of deep-rooted plants such as trees and vines within 15 feet of the pipeline centerline for protection of the pipeline, but other agricultural uses would be allowed. The primary staging areas for vehicles, equipment, materials, and other supplies required for the construction of the pipeline and regulator stations would be near the Project right-of-way (ROW) in existing industrial and commercial yards where accessible. Staging areas would generally be approximately 300 feet by 200 feet. Two areas would be used for pipe storage. One area is located in Arbuckle, and the other is located north of the City of Woodland. Both of these areas are currently disturbed land in commercial zones.

New pipeline construction would involve the following activities:

- Clearing and grading;
- Trenching and topsoil stockpiling;
- Horizontal Directional Drilling (HDD);
- Hammer boring;

- Auger boring/Jack-and-boring;
- Epoxy coating of pipe;
- Pipeline stringing and welding;
- Lowering in the pipeline and backfilling;
- Hydrostatic testing of the pipe sections; and
- Pigging.

The main travel routes that would be used for construction access and delivery of pipe along Line 406 would include County Road (CR) 85, CR-87, CR-88A, CR-17, CR-19, and some smaller roads on the east side of Interstate (I) 5. Travel routes to be used for construction access and delivery of pipe along Line 407 would include CR-16, CR-16A, CR-17, Baseline Road, Riego Road, and Powerline Road. Streets and roads perpendicular to the main routes that may also be used to access the Project area include Watt Avenue, West Elverta Road, Walerga Road, State Route (SR) 70/99, and SR-113. During construction, the transporting of the required amount of pipe and associated construction equipment could result in a temporary increase of up to 40 trucks a day (80 trips per day) on these respective roadways.

The pipeline would be operated and maintained in accordance with all applicable requirements included in the U.S., Department of Transportation (DOT) regulations in 49 CFR 192, "Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards." Further, the proposed Project would be subject to California Public Utilities Commission (CPUC) standards as embodied under General Order 112E. Operations and maintenance activities that would occur at regular intervals include the following: cathodic protection (protection against pipeline corrosion), cathodic protection monitoring, valve testing, pipeline patrols, and High Consequence Area (HCA) risk assessment.

ALTERNATIVES TO PROPOSED PROJECT

The California Environmental Quality Act (CEQA) Guidelines (section 15126.6(a)) require that a range of reasonable alternatives to the proposed Project be described, analyzed, and (1) would feasibly attain most of the basic objectives of the proposed Project, and (2) would avoid or substantially lessen any of the significant impacts of the proposed Project.

The CEQA Guidelines requires the selection of an environmentally superior alternative. The determination of an environmentally superior alternative is based on the consideration of how the alternative fulfills the Project objectives and how the alternative either reduces significant, unavoidable impacts or substantially reduces the impacts to the surrounding environment. The CEQA Guidelines section 15126.6(e)(2) state, in part, that "If the environmentally superior alternative is the "No Project" alternative, the EIR would also identify an environmentally superior alternative among the other alternatives."

Not all alternatives that were developed are completely analyzed in the EIR. Feasible alternatives that did not clearly offer the potential to reduce significant environmental impacts along with infeasible alternatives were removed from further analysis. Four alternatives were eliminated from detailed analysis. These alternatives include:

- Line 406 and 407 Northern Alternative was eliminated from further analysis since this proposed pipeline alignment alternative would be exposed to the greatest risk of fault rupture, and because a substantial segment of the alignment would be located along side-hills adjacent to CR-13;

- Line 407 Southern Alternative was eliminated from further analysis because this proposed pipeline alignment alternative would require more crossings of tributaries of Steelhead Creek, and would affect more vernal pool habitat;

- Line 406 Central Alternative was eliminated from further analysis because this proposed pipeline alignment alternative would parallel an ephemeral stream, passing through natural habitats to CR-14A; and

- Systems Alternatives was eliminated from further analysis because the proposed alignment alternative would require 15 separate projects with substantially greater amounts of pipeline resulting in greater construction impacts.

Alternatives that were analyzed include the No Project Alternative, and twelve different pipeline alignment options. Each option (or alternative) represented a particular segment of alignment that differed in location from the Project so as to attempt to reduce environmental impacts. The twelve options are briefly described below.

No Project Alternative. Under the No Project Alternative, a natural gas pipeline would not be constructed between existing Lines 400 and 401 in Yolo County and the existing Line 123 in Placer County. PG&E's studies indicate that the natural gas transmission and distribution system may not be able to serve customers reliably and planned development in Yolo, Sacramento, Sutter, and Placer counties by 2009 (see Section 2, Project Description). Additionally, continued growth in those counties would put further strain on existing natural gas infrastructure, and could result in emergency restriction or interruption of services.

Option A. From Lines 400 and 401, Option A would follow CR-16 to I-505, then head north through a grape vineyard to align with CR-15B on the west side of I-505. The route would continue east on CR-15B through the Dunnigan Hills and across Smith Creek until CR-15B becomes CR-93. From this juncture, this alternative would continue east from the intersection of CR-15B and CR-93, and proceed cross-country to Line 172A just south of the town of Dufour. It would then parallel Line 172A south to the tie-in point with Line 172A and Line 407, north of the town of Yolo. This option would increase the overall pipeline length by approximately 2,200 feet. Figure 3-2B shows Option A.

This option would result in a reduction in the magnitude of impacts to aesthetics and noise due to the movement of a portion of the pipeline construction further away from residences. This option would have similar impacts as the proposed Project in the resource areas of air quality, hydrology and water quality, recreation, population and utilities, and energy and mineral resources.

This option would result in a greater magnitude of impacts to agricultural resources, biological resources, cultural resources, soils, seismic and risk of upset hazards, land use, and traffic. These impacts would be increased in magnitude due to an increase in the length of the pipeline along the boundaries of agricultural fields, increased disturbance of soils, the potential for increased introduction of invasive species, and the potential for increased disturbance of sensitive plants. The difference in impacts to cultural resources is assumed to be greater since Option A would increase the area of disturbance and occur outside of the corridor surveyed for cultural resources. This option would increase the seismic impacts by crossing the southern end of the Dunnigan Hills Fault in the vicinity of an apparent surface fault rupture. Also, by placing the pipeline in close proximity to Durst Organic Farmers, a new "high consequence area" or "HCA" would be created along the pipeline as defined by DOT 192.903, based upon the number of employees and the number of days they would congregate near the pipeline. Option A would affect traffic during pipeline construction along roadways used by Durst for employees, visitors, and workers transporting their produce.

Option A would not reduce the significant and unavoidable impacts associated with the proposed Project (construction air quality, hazards from the risk of pipeline upset, and land use compatibility).

Option B. From Lines 400 and 401, approximately 1.5 miles north of the proposed Project, Option B would extend east along farm roads, crossing CR-86 and aligning with CR-16. The route would continue along the south side of CR-16 for approximately 3 miles to CR-86, and then turn south along farm roads to a point intercepting the proposed I-505 crossing. This option would increase the overall pipeline length by approximately 2,640 feet. Figure 3-2B shows Option B.

This option would not result in a reduction of any impacts associated with the proposed Project. This option would have similar impacts as the proposed Project in the resource areas of air quality, hydrology and water quality, noise, recreation, population and utilities, and energy and mineral resources.

This option would result in a greater magnitude of impacts to agricultural resources, aesthetics, biological resources, cultural resources, soils, risk of upset hazards, land use, and traffic. These impacts would be increased in magnitude due to an increase in the length of the pipeline along the boundaries of agricultural fields and the placement closer to roadways where construction activities would be more visible. Option B would also increase the potential for introduction of invasive species, increase the potential for disturbance to sensitive plants, increase the number of trees impacted (potential Swainson’s hawk nesting habitat), increase disturbance to soils, and place the pipeline outside of the area surveyed for cultural resources. Also, by placing the pipeline in close proximity to Durst Organic Farmers, a new “high consequence area” or “HCA” would be created along the pipeline as defined by DOT 192.903, based upon the number of employees and the number of days they would congregate near the pipeline. Option B would affect traffic during pipeline construction along roadways used by Durst for employees, visitors, and workers transporting their produce.

Option B would not reduce the significant and unavoidable impacts associated with the proposed Project (construction air quality, hazards from the risk of pipeline upset, and land use compatibility).

Option C. Option C would follow the proposed alignment of Line 406 from the Capay Metering Station to the Hungry Hollow Canal, which it would parallel northeast until crossing to line up with an unnamed farm road to the east. This alternative would cross CR-85 and extend east along the farm road and the northern edge of Microp Limited Property, APN # 048-140-140-191. At the end of the property, the route would turn south along another unnamed farm road until it intersects the proposed Line 406 route, which it then would follow to the Yolo Junction Station. This option would increase the overall pipeline length by roughly 1,150 feet. Figure 3-2C depicts Option C.

This option would not result in a reduction of any impacts associated with the proposed Project. This option would have similar impacts as the proposed Project in the resource areas of aesthetics, air quality, cultural resources, geologic and risk of upset hazards, hydrology and water quality, land use and planning, noise, recreation, population and utilities, energy and mineral resources, and transportation. While Option C would result in similar impacts to agricultural resources as the proposed Project, it would result in less segmenting of agricultural fields.

This option would result in a greater magnitude of impacts to biological resources and soils. These impacts would be increased in magnitude due to an increase in the number of trees impacted, the increased disturbance of soils, and the increased potential for introduction of invasive species.

Option C would not reduce the significant and unavoidable impacts associated with the proposed Project (construction air quality, hazards from the risk of pipeline upset, and land use compatibility).

Option D. Option D would involve a minor variation to the proposed Line 406 in the vicinity of the Hungry Hollow area in north-central Yolo County, but it would maintain Line 406 within CR-17 east of CR-87, and then extend south after crossing an unnamed irrigation lateral where it would realign with the proposed Line 406 route, just west of the I-505 HDD crossing. East of I-505, this alternative would follow the same alignment as the proposed Project. This option would increase the overall pipeline length by roughly 860 feet. Figure 3-2D shows Option D.

This option would not result in a reduction of any impacts associated with the proposed Project. This option would have similar impacts as the proposed Project in the resource areas of aesthetics, air quality, cultural resources, geologic hazards, hydrology and water quality, land use and planning, noise, recreation, population and utilities, energy and mineral resources, and transportation. While Option D would result in similar impacts to agricultural resources as the proposed Project, it would result in less segmenting of agricultural fields.

This option would result in a greater magnitude of impacts to noise, aesthetics, hazards, biological resources, soils, and cultural resources. These impacts would be increased in magnitude due to placing the construction of the pipeline closer to residences and thereby increasing the construction noise, visibility of construction activities, and the risk of upset hazards to a greater number of people. Option D would also increase the number of trees impacted, and place the pipeline outside of the area previously surveyed for cultural resources.

Option D would not reduce the significant and unavoidable impacts associated with the proposed Project (construction air quality, hazards from the risk of pipeline upset, and land use compatibility).

Option E. Option E would involve a minor realignment of the proposed Line 406 route. This would position the route to follow CR-19, east of CR-87. At CR-19A, it would extend back to the north via an existing dirt road and underneath a large electrical transmission corridor. This route alternative would then cross an irrigation lateral and continue north where it would converge back with the proposed Line 406 route, just west of I-505. This alternative would then follow the same route as the proposed Project east of I-505. This option would increase the overall pipeline length by roughly 3,480 feet. Figure 3-2D shows Option E.

This option would not result in a reduction of any impacts associated with the proposed Project. This option would have similar impacts as the proposed Project in the resource areas of air quality, cultural resources, geologic hazards, hydrology and water quality, land use and planning, noise, recreation, population and utilities, energy and mineral resources, and transportation. While Option E would result in similar impacts to agricultural resources as the proposed Project, it would result in less segmenting of agricultural fields.

This option would result in a greater magnitude of impacts to aesthetics, noise, biological resources, soils, and cultural resources. These impacts would be increased in magnitude due to placing the construction of the pipeline closer to residences and thereby increasing the construction noise, visibility of construction activities, and the risks of upset hazards to a greater number of people. Option E would also increase the number of trees impacted, increase the disturbance of soils, and place the pipeline outside of the area previously surveyed for cultural resources.

Option E would not reduce the significant and unavoidable impacts associated with the proposed Project (construction air quality, hazards from the risk of pipeline upset, and land use compatibility).

Option F. Option F would follow the proposed alignment for Line 406 from Lines 400 and 401 to the eastern end of the Dunnigan Hills, where it would turn north off CR-17 approximately 5,000 feet west of CR-95A. This alternative option would not alter the length of the segment, but would turn north to align with the I-5 crossing further east than the proposed alignment. Figure 3-2E shows Option F.

This option would result in a reduction in the number of trees impacted. This option would also result in a reduced number of residences to evaluate for eligibility for listing on the NRHP or the CRHR. This option would have similar impacts as the proposed Project in the resource areas of aesthetics, agricultural resources, air quality, hydrology and water quality, geologic and risk of upset hazards, recreation, land use, noise, population and utilities, traffic, and energy and mineral resources.

This option would increase the magnitude of impacts to biological resources by bordering an ephemeral drainage with adjacent wetlands that the Project avoids.

Option F would not reduce the significant and unavoidable impacts associated with the proposed Project (construction air quality, hazards from the risk of pipeline upset, and land use compatibility).

Option G. Option G would be located at the western end of Line 407 West, just east of the Yolo Junction Station and existing Line 172A. This alternative leaves the proposed Yolo Junction Station and aligns with an unnamed farm road, which it follows along a field edge until the intersection of CR-16A and CR-98. This alternative option would not alter the length of the segment. Figure 3-2F shows Option G.

This option would not result in a reduction of any impacts associated with the proposed Project. This option would increase the magnitude of impacts to biological resources due to an increase in the number of trees impacted. This option would have similar impacts as the proposed Project in the resource areas of aesthetics, agricultural resources, air quality, hydrology and water quality, geologic and risk of upset hazards, recreation, land use, noise, population and utilities, traffic, cultural resources, and energy and mineral resources.

Option G would not reduce the significant and unavoidable impacts associated with the proposed Project (construction air quality, hazards from the risk of pipeline upset, and land use compatibility).

Option H. Near the western levee of the Yolo Bypass, Option H would head southeast through agricultural fields within the Yolo Bypass to a point on the Sacramento River directly across from West Elverta Road. It would then cross the Sacramento River and parallel West Elverta Road to Powerline Road. The route would head north paralleling Powerline Road to Riego Road and would then parallel Riego Road through the Natomas Basin Conservancy to Steelhead Creek. The route would parallel the northern border of the Placer Vineyards Specific Plan area along Baseline Road (Riego Road becomes Baseline Road in Placer County) until the tie-in with Line 123 at the intersection of Baseline Road and Fiddyment Road. This alternative option would reduce the overall pipeline length by roughly 2,900 feet. Figure 3-2G shows Option H.

This option would result in a reduction in the magnitude of impacts to aesthetics and noise due to the movement of a portion of the pipeline further away from residences. Because of the reduced length, this option would reduce impacts to soils and reduce the potential for introduction of invasive species.

This option would have similar impacts as the proposed Project in the resource areas of agricultural resources, air quality, hydrology and water quality, geologic and risk of upset hazards, recreation, land use, population and utilities, traffic, and energy and mineral resources.

This option would increase the magnitude of impacts to biological resources due to an increase in the number of trees, wetlands, and riparian woodland communities impacted. The difference in impacts to cultural resources is unknown since Option H would occur outside of the corridor surveyed for cultural resources.

Option H would not reduce the significant and unavoidable impacts associated with the proposed Project (construction air quality, hazards from the risk of pipeline upset, and land use compatibility).

Option I. This option would follow the proposed alignment for Line 407-E along Base Line Road to South Brewer Road, where the pipeline would extend north along the west side of South Brewer Road, crossing one seasonal wetland, to a point approximately 1,500 feet north of the intersection of Base Line Road and South Brewer Road. This alternative would then extend east for approximately 1.0 mile through agricultural land, crossing Steelhead Creek and two seasonal wetlands before reaching Country Acres Lane. From this point, this alternative would turn south and travel through pasture/fallow agricultural fields along the east side of Country Acres Lane, crossing seasonal wetlands. At the intersection with Base Line Road, the pipeline would join and follow the remainder of the proposed alignment for Line 407-E along Base Line Road. This option would increase the overall pipeline length by roughly 2,900 feet. Figure 3.2-H depicts Option I.

This option would result in a reduction in the magnitude of impacts to aesthetics and noise due to the movement of a portion of the pipeline to a location with fewer residences. This option would reduce the risk of upset hazards to a planned high school site.

This option would have similar impacts as the proposed Project in the resource areas of agricultural resources, air quality, hydrology and water quality, geologic hazards, recreation, land use, population and utilities, traffic, and energy and mineral resources.

This option would increase the magnitude of impacts to biological resources such as seasonal wetlands and swales, a vernal pool, and an additional creek, though it would reduce impacts to trees. This option would also increase the magnitude of disturbance to soils, which may increase the potential for introduction of invasive species.

Option I would not reduce the significant and unavoidable impacts associated with the proposed Project (construction air quality, hazards from the risk of pipeline upset, and land use compatibility).

Option J. This option would follow the proposed alignment for Line 407-E along Base Line Road to South Brewer Road, where the pipeline would extend north along the west side of South Brewer Road, crossing one seasonal wetland, a vernal pool, and Steelhead Creek, to a point approximately 2,600 feet north of the intersection of Base Line Road and South Brewer Road. This alternative would then extend approximately 0.5 mile east through agricultural land and seasonal wetlands before turning south for approximately 0.1 mile. This alternative would then turn east again and extend approximately 0.5 mile along the edge of a rice field to Country Acres

Lane. From this point, this alternative would turn south and travel through pasture/fallow agricultural fields along the east side of Country Acres Lane, crossing a seasonal swale and seasonal wetlands. At the intersection with Base Line Road, the pipeline would join and follow the remainder of the proposed alignment for Line 407-E along Base Line Road. This option would increase the overall pipeline length by roughly 5,250 feet. Figure 3.2-I shows Option J.

This option would result in a reduction in the magnitude of impacts to aesthetics and noise due to the movement of a portion of the pipeline to a location with fewer residences. This option also would reduce the risk of upset hazards to a planned high school site.

This option would have similar impacts as the proposed Project in the resource areas of agricultural resources, air quality, hydrology and water quality, geologic hazards, recreation, land use, population and utilities, traffic, and energy and mineral resources.

This option would increase the magnitude of impacts to biological resources such as seasonal wetlands and swales, and a vernal pool, though reduce impacts to trees (potential Swainson's hawk nesting habitat). This option would also increase the magnitude of disturbance to soils, which may increase the potential for introduction of invasive species.

Option J would not reduce the significant and unavoidable impacts associated with the proposed Project (construction air quality, hazards from the risk of pipeline upset, and land use compatibility).

Option K. Option K would follow the proposed alignment for Line 407-E along Base Line Road to a location approximately 3,300 feet east of Country Acres Lane. This alternative would then extend northeast, at an angle, to a point approximately 150 feet north of Base Line Road. The pipeline would then turn and extend directly east for approximately 0.2 mile, and then would turn southeast and extend, at an angle, back to Base Line Road. The pipeline would then join and follow the remainder of the proposed alignment for Line 407-E along Base Line Road. This alternative would cross a vernal pool and seasonal wetlands, and would require the redesign or relocation of the proposed HDD at this location in order to construct this alternative alignment. This option would increase the overall pipeline length by roughly 70 feet. Figure 3.2-J shows Option K.

This option would result in a reduction in the magnitude of impacts to aesthetics and noise due to the movement of a portion of the pipeline to a location with fewer residences. This option would help reduce the risk of upset to a planned elementary school.

This option would have similar impacts as the proposed Project in the resource areas of agricultural resources, air quality, hydrology and water quality, geologic hazards, recreation, land use, population and utilities, traffic, and energy and mineral resources.

This option would increase the magnitude of impacts to biological resources such as seasonal wetlands and swales, and a vernal pool. Option K would not reduce the significant and unavoidable impacts associated with the proposed Project (construction air quality, hazards from the risk of pipeline upset, and land use compatibility).

Option L. Option L would follow the proposed alignment for Line 407-E along Base Line Road, but would extend the proposed HDD approximately 1,345 feet to the east. This alternative would increase the depth of cover through the buffer zone to approximately 35 feet and reduce the risk potential to a planned elementary school south of Base Line Road. Approximately 1,000 feet of trenching for Line 407 E would be replaced by HDD construction. Figure 3.2-K shows Option L. This option would include the following PG&E Applicant Proposed Measure:

APM ALT-L

PG&E would partner with the Center Unified School District to jointly develop a risk analysis in accordance with section 14010(h) of Title 5 of the California Code of Regulations regarding the location of a school site within 1,500 feet of a pipeline. The risk analysis would include a quantitative risk assessment to evaluate potential pipeline impacts to the school. If the assessment determines that there is a risk of serious injury or fatality presented by the pipeline, corrective measures would be recommended to reduce the probability and/or consequence such that the risk is reduced to an acceptable level per the above-mentioned regulation.

This option would help reduce the risk of upset to a planned elementary school. This option would not result in an increase in the magnitude of any impacts associated with the proposed Project. This option would have similar impacts as the proposed Project in the resource areas of aesthetics, agricultural resources, air quality, hydrology and water quality, geologic and risk of upset hazards, recreation, land use, noise, population and utilities, traffic, cultural resources, and energy and mineral resources.

Option L would not reduce the significant and unavoidable impacts associated with the proposed Project (construction air quality, hazards from the risk of pipeline upset, and land use compatibility).

ENVIRONMENTAL IMPACTS AND MITIGATION

Table ES-1 presents a summary of impacts and mitigation measures for the proposed Project. This table is presented by issue area. Within each issue area, each impact that requires mitigation is described and classified, and recommended mitigation is listed, and the level of impact with mitigation is stated.

COMPARISON OF PROPOSED PROJECT AND ALTERNATIVES

The CEQA Guidelines (section 15126.6 (d)) requires that an EIR include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed Project. A matrix displaying the major characteristics and significant environmental effects of each alternative may be used to summarize the comparison. Table ES-2 provides a comparison of the proposed Project with each of the Alternatives evaluated in this document, including the No Project Alternative.

Table ES-1: Summary of Environmental Impacts for the Proposed Project

Impact Class	Description
I	Significant adverse impact that remains significant after mitigation.
II	Significant adverse impact that can be eliminated or reduced below an issue's significance criteria.
III	Adverse impact that does not meet or exceed an issue's significance criteria.
IV	Beneficial impact.

Impact No.	Impact	Impact Class	Recommended Mitigation Measures
Section 4.1 Aesthetic/Visual Resources			
AES-1	The Project would substantially degrade the existing visual character or quality of the site and its surroundings.	II	**AES-1** Replanting of screening vegetation.
AES-2	The proposed Project would create a new source of substantial light or glare that would adversely affect day or nighttime views in the area.	II	**AES-2** Light shielding and positioning away from residences.
Section 4.2 Agricultural Resources (Less than Significant (Class III) - No Impact Statements or Mitigation Measures)			
Section 4.3 Air Quality			
AQ-1	The Project would result in construction or operational emissions that exceed quantitative significance thresholds (including quantitative thresholds for ozone precursors) established by air pollution control districts in which the Project would be constructed.	I	**AQ-1a** Fugitive PM_{10} Control. **AQ-1b** NO_x Mitigation Menu.
AQ-2	The Project would result in emissions that substantially contribute to an exceedance of a State or Federal ambient air quality standard.	I	**AQ-1a** Fugitive PM_{10} Control. **AQ-1b** NO_x Mitigation Menu.

Impact No.	Impact	Impact Class	Recommended Mitigation Measures
AQ-3	The Project would produce greenhouse gas emissions and contribute to climate change.	II	**AQ-3** GHG Emission Offset Program.
Section 4.4 Biological Resources			
BIO-1	The proposed Project would fill or alter a wetland or vernal pool, resulting in a long-term change in its hydrology or soils, or the composition of vegetation of a unique, rare, or special concern wetland community.	II	**BIO-1a** Wetland avoidance and restoration. **BIO-1b** Trench backfill and topographic restoration. **BIO-1c** Riparian avoidance and restoration.
BIO-2	The Project would result in the long-term (more than 5 years) reduction or alteration of unique, rare, or special concern vegetation types, riparian vegetation, or natural communities.	II	**BIO-2a** Tree avoidance and replacement. **BIO-2b** Avoidance of valley oak woodland.
BIO-3	The Project would introduce new, or lead to the expanded range of existing, invasive noxious weed species or soil pests, so that they interfere with crop production or successful revegetation of natural communities.	II	**BIO-3** Prepare and implement an invasive species control program.
BIO-4	The Project would cause a temporary loss or alteration of habitat important for one or more listed species that could result in avoidance by a listed species, or that could cause increased mortality or lowered reproductive success of the species.	II	**BIO-4a** Protect special-status wildlife. **BIO-4b** Mitigation for potential impacts to Natomas Basin Conservancy mitigation lands. **BIO-4c** Mitigation for potential impacts to Sacramento River Ranch Conservation Bank mitigation lands. **BIIO-4d** Protect special-status bird species.
Section 4.5 Cultural Resources			
PALEO-1	Project construction or operation would result in damage or loss of vertebrate or invertebrate fossils that are considered important by paleontologists and land management agency staff.	II	**PALEO-1** Proper curation of fossil collection.

Impact No.	Impact	Impact Class	Recommended Mitigation Measures
PALEO-2	The Project is considered to be a resource having scientific or educational value based on the significance criteria given in Section 4.6.3.	II	**PALEO-2** Delivery of fossil collection to appropriate location.
Section 4.6 Geology and Soils			
GEO-1	The Project would result in a risk of damage to structures from ground motion due to a seismic event or resulting phenomenon such as liquefaction or settlement, or from rupture of a known earthquake fault as delineated on the most recent Alquist Priolo Earthquake fault Zoning Map.	II	**GEO-1** Site specific seismic field investigation.
Section 4.7 Hazards and Hazardous Materials			
HAZ-1	The Project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan; but could expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.	II	**HAZ-1** Minimize risk of fire.
HAZ-2	The Project would expose people to an unacceptable risk of existing or potential hazards, including upset and accident conditions involving the risk for fires, explosions, or the release of natural gas into the environment.	I	**HAZ-2a** Corrosion mitigation. **HAZ-2b** Installation of automatic shutdown valves.
Section 4.8 Hydrology and Water Quality			
HWQ-1	The Project could result in violation of Federal or State Agency quantitative or qualitative water quality criteria, standards, or objectives (including objectives promulgated by the CVRWQCB and criteria set forth in the Proposed California Toxics Rule).	II	**HWQ-1** Response to unanticipated release of drilling fluids.

Impact No.	Impact	Impact Class	Recommended Mitigation Measures
HWQ-2	The Project could interrupt or degrade groundwater used for private or municipal purposes.	II	**HWQ-2** Verify well locations.
HWQ-3	The Project would place permanent structures within the 100-year floodplain that would be damaged by flooding.	II	**HWQ-3** Flood-proof pump houses within 100-year floodplain.
Section 4.9 Land Use and Planning			
LU-1	The proposed Project would not conflict with development plans for the Sutter Pointe Specific Plan Area, Placer Vineyards Specific Plan, the Sierra Vista Specific Plan, or the Curry Creek Specific Plan, but would cross lands included in the Natomas Basin Conservancy and River Ranch Conservation Bank. The Project could also conflict with operation of Western Area Power Administration (WAPA) power lines.	II	**LU-1a** Mitigation for impacts to the Natomas Basin Conservancy mitigation lands. **LU-1b** Mitigation for impacts to the Sacramento River Ranch Conservation Bank mitigation lands. **LU-1c** WAPA license agreement.
LU-2	The proposed Project would expose people to an unacceptable risk of existing or potential hazards, including upset and accident conditions involving the risk for fires, explosions, or the release of natural gas into the environment.	I	**LU-2a** Mitigation for safety risk to nearby land uses. **LU-2b** Mitigation for safety risk to nearby land uses.
Section 4.10 Noise			
NOI-1	Noise levels from Project construction would exceed criteria defined in a construction noise ordinance or general plan of the local jurisdiction in which the activity occurs.	II	**NOI-1a** Limited construction hours. **NOI-1b** Best management practices. **NOI-1c** Noise reduction plan.

Impact No.	Impact	Impact Class	Recommended Mitigation Measures
NOI-2	Groundborne vibrations or groundborne noise from Project activities would have substantial direct or indirect effects on persons or structures.	II	**NOI-2a** Distance from residences. **NOI-2b** Heavy-loaded trucks. **NOI-2c** Earth-moving equipment/distance from vibration-sensitive sites. **NOI-2d** Nighttime construction.
Section 4.11 Recreation (Less than Significant (Class III) - No Impact Statements or Mitigation Measures)			
Section 4.12 Population and Housing/Public Services/Utilities and Service Systems (Less than Significant (Class III) - No Impact Statements or Mitigation Measures)			
Section 4.13 Transportation and Traffic (Less than Significant (Class III) - No Impact Statements or Mitigation Measures)			
Section 4.14 Energy and Mineral Resources (Less than Significant (Class III) - No Impact Statements or Mitigation Measures)			

Table ES-2: Summary of Environmental Impacts for Proposed Project and Alternatives

Impact Class	**Description**
I	Significant adverse impact that remains significant after mitigation.
II	Significant adverse impact that can be eliminated or reduced below an issue's significance criteria.
III	Adverse impact that does not meet or exceed an issue's significance criteria.
IV	Beneficial impact.

Magnitude of Alternative Option Impact as compared to the Proposed Project is shown by the following:

0 = No Impact
/ = Similar Impact
- = Lesser Magnitude of Impact
+ = Greater Magnitude of Impact

Impact No.	**Impact Description**	**Pro-posed Project**	**No Project**	**OPTIONS**											
				A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**
Section 4.1 Aesthetics and Visual Resources															
AES-1	The Project substantially degrade the existing visual character or quality of the site and its surroundings.	II	No Impact 0	II -	II /	II /	II +	II +	II -	II /	II -	II -	II -	II /	II /

Impact No.	Impact Description	Pro-posed Project	No Project	OPTIONS											
				A	B	C	D	E	F	G	H	I	J	K	L
AES-2	The Project would create a new source of substantial light or glare that would adversely affect day or nighttime views in the area.	II	No Impact 0	II -	II /	II /	II +	II +	II -	II /	II -	II -	II -	II /	II /
Section 4.2 Agricultural Resources (No Impact)															
Section 4.3 Air Quality															
AQ-1	The Project would result in construction or operational emissions that exceed quantitative significance thresholds (including quantitative thresholds for ozone precursors) established by air pollution control districts in which the Project would be constructed.	II	No Impact 0	II /	II /	II /	II /	II /	II /	II /	II /	II /	II /	II /	II /
AQ-2	The Project would result in emissions that substantially contribute to an exceedance of a State or Federal ambient air quality standard.	I	No Impact 0	I /	I /	I /	I /	I /	I /	I /	I /	I /	I /	I /	I /

Impact No.	Impact Description	Pro-posed Project	No Project	OPTIONS											
				A	B	C	D	E	F	G	H	I	J	K	L
AQ-3	The Project would produce greenhouse gas emissions and contribute to climate change.	II	No Impact 0	II +	II +	II +	II +	II +	II /	II /	II -	II +	II +	II +	II +
Section 4.4 Biological Resources															
BIO-1	The Project would fill or alter a wetland or vernal pool, resulting in a long-term change in its hydrology or soils, or the composition of vegetation of a unique, rare, or special concern wetland community.	II	No Impact 0	II +	II +	II /	II /	II /	II /	II /	II +	II +	II +	II +	II -
BIO-2	The Project would result in the long-term (more than 5 years) reduction or alteration of unique, rare, or special concern vegetation types, riparian vegetation, or natural communities.	II	No Impact 0	II /	II /	II /	II /	II /	II /	II /	II /	II /	II /	II /	II /

Impact No.	Impact Description	Pro-posed Project	No Project	OPTIONS A	B	C	D	E	F	G	H	I	J	K	L
BIO-3	The Project would introduce new, or lead to the expanded range of existing, invasive noxious weed species or soil pests, so that they interfere with crop production or successful revegetation of natural communities.	II	No Impact 0	II +	II +	II +	II +	II +	II -	II +	II -	II +	II +	II -	II -
BIO-4	The Project would cause a temporary loss or alteration of habitat important for one or more listed species that could result in avoidance by a listed species, or that could cause increased mortality or lowered reproductive success of the species.	II	No Impact 0	II -	II +	II +	II +	II +	II /	II +	II +	II +	II +	II -	II -
BIO-5	The Project would result in direct or indirect impact on special-status plant species that could reduce the abundance or substantially reduce the species numbers of	No Impact	No Impact 0	II +	II +	III /	II +	II +	III /	III /	II +	II +	II +	III /	III /

Impact No.	Impact Description	Pro-posed Project	No Project	OPTIONS											
				A	B	C	D	E	F	G	H	I	J	K	L
	special-status plant species.														
Section 4.5 Cultural Resources															
PALEO-1	Project construction or operation would result in damage or loss of vertebrate or invertebrate fossils that are considered important by paleontologists and land management agency staff.	II	No Impact 0	II /	II /	II /	II /	II /	II /	II /	II /	II /	II /	II /	II /
PALEO-2	The Project is considered to be a resource having scientific or educational value based on the significance criteria given in Section 4.6.3.	II	No Impact 0	II /	II /	II /	II /	II /	II /	II /	II /	II /	II /	II /	II /
CR-1	The Project would result in damage to, disruption of or otherwise adversely affect an important archeological or a listed important historic resource.	No Impact	No Impact 0	II +	II +	III /	II +	II +	III -	III /	II +	III -	III -	III /	III /

Impact No.	Impact Description	Pro-posed Project	No Project	OPTIONS											
				A	B	C	D	E	F	G	H	I	J	K	L
Section 4.6 Geology, Soils, and Mineral Resources															
GEO-1	The Project would result in a risk of damage to structures from ground motion due to a seismic event or resulting phenomenon such as liquefaction or settlement, or from rupture of a known earthquake fault as delineated on the most recent Alquist Priolo Earthquake fault Zoning Map.	II	No Impact 0	II +	II +	II +	II +	II +	II /	II /	II -	II +	II /	II /	II /
Section 4.7 Hazards and Hazardous Materials															
HAZ-1	The Project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan; but could expose people or structures to a significant	II	No Impact 0	II /	II /	II /	II /	II /	II /	II /	II /	II /	II /	II /	II /

Impact No.	Impact Description	Pro-posed Project	No Project	OPTIONS											
				A	B	C	D	E	F	G	H	I	J	K	L
	risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.														
HAZ-2	The Project would expose people to an unacceptable risk of existing or potential hazards, including upset and accident conditions involving the risk for fires, explosions, or the release of natural gas into the environment.	I	No Impact 0	I +	I +	I /	I +	I +	I +	I /	I /	I -	I -	I -	I -

Impact No.	Impact Description	Pro-posed Project	No Project	OPTIONS											
				A	B	C	D	E	F	G	H	I	J	K	L
Section 4.8 Hydrology and Water Quality															
HWQ-1	The Project could result in violation of Federal or State Agency quantitative or qualitative water quality criteria, standards, or objectives (including objectives promulgated by the CVRWQCB and criteria set forth in the Proposed California Toxics Rule).	II	No Impact 0	II +	II /	II +	II -	II -	II /	II /	II +	II +	II +	II /	II /
HWQ-2	The Project could interrupt or degrade groundwater used for private or municipal purposes.	II	No Impact 0	II -	II +	II /	II +	II +	II -	II +	II -	II -	II -	II /	II /
HWQ-3	The Project would place permanent structures within the 100-year floodplain that would be damaged by flooding.	II	No Impact 0	II /	II /	II /	II /	II /	II /	II /	II /	II /	II /	II /	II /

Impact No.	Impact Description	Pro-posed Project	No Project	OPTIONS											
				A	B	C	D	E	F	G	H	I	J	K	L
Section 4.9 Land Use and Planning															
LU-1	The Project would not conflict with development plans for the Sutter Pointe Specific Plan Area, Placer Vineyards Specific Plan, the Sierra Vista Specific Plan, or the Curry Creek Specific Plan, but would cross lands included in the Natomas Basin Conservancy and River Ranch Conservation Bank. The Project could also conflict with operation of Western Area Power Administration (WAPA) power lines.	II	No Impact 0	II /	II /	II /	II /	II /	II /	II +	II +	II -	II -	II -	II -
LU-2	The Project would expose people to an unacceptable risk of existing or potential hazards, including upset and accident conditions involving the risk for	I	No Impact 0	I +	I +	I /	I +	I +	I +	I /	I /	I -	I -	I -	I -

Impact No.	Impact Description	Pro-posed Project	No Project	OPTIONS											
				A	B	C	D	E	F	G	H	I	J	K	L
	fires, explosions, or the release of natural gas into the environment.														
Section 4.10 Noise															
NOI-1	Noise levels from Project construction would exceed criteria defined in a construction noise ordinance or general plan of the local jurisdiction in which the activity occurs.	II	No Impact 0	II -	II /	II /	II +	II +	II -	II /	II /	II -	II -	II /	II /
NOI-2	Groundborne vibrations or groundborne noise from Project activities would have substantial direct or indirect effects on persons or structures.	II	No Impact 0	II -	II /	II /	II +	II +	II -	II /	II /	II -	II -	II /	II /
Section 4.11 Recreation (Less than Significant (Class III) – No Impact Statements or Mitigation Measures)															
Section 4.12 Socioeconomics (Less than Significant (Class III) – No Impact Statements or Mitigation Measures)															
Section 4.13 Transportation and Traffic															

Impact No.	Impact Description	Pro-posed Project	No Project	OPTIONS											
				A	B	C	D	E	F	G	H	I	J	K	L
TRANS-1	Project related traffic or other activities could restrict one or more travel lanes of a primary or secondary arterial during peak-hour traffic, thereby reducing the roadway's capacity and creating congestion.	III	No Impact 0	II +	II +	III /	III +	III +	III /	III /	III /	III /	III /	III /	III +
Section 4.14 Energy and Mineral Resources (Less than Significant (Class III) - No Impact Statements or Mitigation Measures)															

ENVIRONMENTALLY SUPERIOR ALTERNATIVE

The CEQA Guidelines (section 15126.6 (d)) require that an EIR include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed Project. The Guidelines (Section 15126.6 (e)(2)) further state, in part, that "*If the environmentally superior alternative is the "No Project" alternative*, the EIR shall also identify an environmentally superior alternative among the other alternatives." (*Emphasis* added).

A narrative summary of the impacts associated with Alternative Options A through L, as compared to the proposed Project impacts, was provided above. Table ES-2 summarizes the environmental impacts for the proposed Project, the No Project Alternative, and the twelve alternative options analyzed in the Draft EIR. None of the alternative options A through L that were analyzed would reduce the significant and unavoidable (Class I) impacts associated with the proposed Project. Those impacts are associated with construction air quality, hazards from the risk of pipeline upset, and land use compatibility.

While none of the alternative options A through L reduce any of the Class I impacts to less than significant, nor any of the Class II impacts to less than significant without mitigation, some of the options do reduce the magnitude of the impacts associated with the proposed Project. Table ES-2 also depicts whether the impacts associated with the project are the same, reduced in magnitude, or increased in magnitude by each alternative option.

Under the No Project Alternative, a natural gas pipeline would not be constructed between existing Lines 400 and 401 in Yolo County and the existing Line 123 in Placer County. PG&E's studies indicate that the natural gas transmission and distribution system may not be able to reliably serve current customers and planned development in Yolo, Sacramento, Sutter, and Placer counties by 2009. Additionally, continued growth in those counties would put further strain on existing natural gas infrastructure, and could result in emergency restriction or interruption of services. The No Project alternative would not result in any of the impacts associated with the proposed Project. Therefore, the No Project alternative is considered the environmentally superior alternative.

Among the other alternatives, the determination of an environmentally superior alternative is difficult because of the many factors that must be balanced, and none of the alternative options reduce the Class I impacts. Some of the impacts may be reduced in magnitude while, at the same time, others are increased in magnitude. In general, there would be minor differences in the magnitude of impacts between the proposed Project and the alternatives, but all would result in the same impact significance levels within each environmental resource area.

Some of the alternative options would reduce the number of agricultural fields that would be segmented by the Project pipeline. However, this would result in the movement of the pipeline closer to roadways, residences, and in some cases businesses, thereby increasing the number of people that would be at risk if a leak or rupture of the pipeline were to occur with a subsequent explosion and/or fire.

The following discussion includes alternative options that would help to reduce the magnitude of some of the impacts associated with the proposed Project, even though some of the other impacts would be greater in magnitude than the proposed alignment in the same segment area.

Alternative Option I would reduce the risk of upset hazards to a planned high school along Baseline Road by moving the pipeline to a location outside of the 1,500-foot safety buffer required by state school regulations. This option would reduce impacts to trees, and would reduce construction noise by moving the pipeline location further from residences along Baseline Road. However, this option would increase the magnitude of impacts to biological resources by impacting a seasonal wetland, swale, vernal pool and a creek not associated with the proposed alignment. All of these impacts would be mitigated in a manner similar to the proposed Project.

Alternative Option L would reduce the risk of upset hazards to a planned elementary school south of Baseline Road. This option would not result in the increase or decrease in the magnitude of any impacts associated with the proposed alignment.

The environmentally superior alternative would be incorporating Alternative Options I and L into the proposed Project alignment. The decrease in the magnitude of impacts to safety risks to planned schools would outweigh the additional impacts to biological resources. The increased magnitude of wetland and vernal pool impacts would be mitigated by the measures outlined in Sections 4.4.4 and 4.4.5.

KNOWN AREAS OF CONTROVERSY OR UNRESOLVED ISSUES

The comments received during the Notice of Preparation (NOP) public scoping period raised issues related to impacts to aesthetic/visual, agricultural, air quality, biological resources, geology and soils, hazards and safety, hydrology and water quality, land use, socioeconomics, and traffic and transportation resources. Appendix B provides a copy of the NOP, copies of comment letters received during the NOP and scoping process, and copies of the transcripts taken at the scoping meetings, and indicates the section of the EIR in which the issue is addressed.

1.0 INTRODUCTION

1.1 PROJECT OBJECTIVES, PURPOSE, AND NEED

The California Environmental Quality Act (CEQA) Guidelines (section 15126.6.a) require that a range of reasonable alternatives to the proposed Project must be described, analyzed, and feasibly attain most of the basic objectives of the Project. Therefore, in order to explain the need for the proposed Project, and to guide in development and evaluation of alternatives, the Project Applicant, Pacific Gas and Electric Company (PG&E), was asked to define its Project objectives. PG&E identified the following objectives for the proposed Line 406/407 Natural Gas Pipeline Project (Project):

- Provide greater capacity and service reliability to the existing gas transmission and distribution pipeline system while minimizing costs to PG&E's customers;
- Extend natural gas service to planned residential and commercial developments in Placer, Sutter, and Sacramento counties;
- Install Project facilities in a safe, efficient, environmentally sensitive, and cost-effective manner; and
- Locate the pipeline to minimize the potential of environmental impacts resulting from damage by outside sources. Outside forces include impact by mechanical equipment, such as bulldozers and backhoes; earth movements due to soil settlement, washouts, or geological hazards; weather effects, such as winds, storms, and thermal strains; and willful damage.

These objectives are discussed below.

1.1.1 Greater Capacity and Service Reliability

PG&E's Sacramento Valley Local Gas Transmission System currently serves approximately 675,000 customers located in some of the highest growth counties in California, including Sacramento, Sutter, Placer, and El Dorado counties. PG&E's current load growth forecast for the system anticipates an average annual increase of 19,890 new gas customers over the next 10 years and a total increase in demand of 135 million cubic feet per day for residential customers and 22 million cubic feet per day for small commercial customers.

PG&E's existing transmission system within the Sacramento Valley region no longer provides sufficient capacity to deliver reliable natural gas service to existing customers or to extend service to planned development in the region. PG&E has indicated that without the addition of this Project, customer service reliability will be at risk and unplanned core customer outages could occur as early as 2009. PG&E's local gas transmission system serving Yolo, Sacramento, El Dorado, Placer, Sutter, Yuba, and Nevada counties has operated at maximum capacity over the last several years and has required an escalating amount of annual investments in pipeline capacity to maintain customer service reliability and serve new customers. This region is projected to continue experiencing a significant amount of ongoing residential and commercial development over the next 25 years, and will require that PG&E respond through the provision of increased local gas transmission pipeline capacity.

1.1.2 Service to Planned Residential and Commercial Developments

The Project would serve several major residential and commercial development projects that are planned in the vicinity of the Project. The Project is needed, in part, to service the following growth areas (PG&E 2007).

- The Metro Air Park - an 1,800-acre commercial development just east of the Sacramento airport. The parcel is bound by West Elverta Road to the north, Lone Tree Road to the east, Interstate 5 to the south, and Powerline Road to the west and would consist of commercial uses that support airport related activity (hotels, car rental companies);

- The Sutter Pointe Project - designates 7,500 acres of the 10,500-acre Industrial/Commercial Reserve area in southern Sutter County for residential, industrial, commercial, and educational development;

- The Placer Vineyards Project - development of a planned 5,230-acre, mixed-use, master-planned community with up to 14,132 residential units, 101 acres of office development, 166 acres of retail commercial centers, and approximately 920 acres of new parks and open space in the southwest corner of Placer County; and

- The Sierra Vista Specific Plan - proposed to consist of approximately 2,100 acres of residential and commercial uses, schools, parks, and open space located west of Fiddyment Road, north of Baseline Road, and south of the City of Roseville's existing boundary.

1.1.3 Efficient and Cost-Effective Planning

PG&E's current 10-year investment plan for meeting the customer load growth projected for the Sacramento Valley Local Transmission System includes a new transmission pipeline that extends from Lines 400 and 401 and travels in a north-south direction paralleling County Road (CR) 85 near Esparto to Line 172A (Line 406), a new transmission pipeline that extends from Line 172A in the town of Yolo east to Line 123 in Roseville (Line 407), and a new distribution feeder main (DFM) that extends from Line 407 south to the Sacramento Metro Air Park. These additions to the local gas transmission system are intended to minimize the cost to PG&E's customers during the planned, incremental increase in capacity.

1.1.4 Safety and Environmental Sensitivity

PG&E corporate goals require that all projects be planned and constructed in an environmentally sensitive manner. Through the selection of the proposed route for the Project and associated construction methods, PG&E has endeavored to minimize potential impacts to environmental resources. To ensure long-term safety of the Project, PG&E would implement a maintenance schedule that requires patrols, leak surveys, cathodic protection surveys, and valve maintenance.

1.1.5 Minimize Damage by Outside Sources

One of PG&E's Project objectives is to select an alignment that minimizes the risk of damage by outside forces (as defined in Section 1.1.1 Project Objectives, Purpose, and Need). Outside forces include impact by mechanical equipment, such as bulldozers and backhoes; earth movements due to soil settlement, washouts, or geological hazards; weather effects, such as winds, storms, and thermal strains; and willful damage. The U.S. Department of Transportation (DOT) requires pipeline operators to report significant pipeline incidents. Damage by outside forces is the most common cause for significant pipeline incidents, at 42.9 percent. The second largest cause is corrosion, at 21.4 percent (PG&E 2007).

The Project right-of-way (ROW) would be coordinated with future road improvement plans to locate the pipeline in future public utility easements and/or landscape strips whenever possible. When traversing agricultural lands, the Project would be located in a straight line of sight such that it is easily identifiable by operators of farm equipment. The Project as proposed by PG&E would have added depth (5 feet of cover rather than the minimum 3 feet of cover required by DOT standards) in agricultural areas to aid in the prevention of damage by outside forces.

1.2 PURPOSE AND SCOPE OF EIR

Section 15124(d) of the CEQA Guidelines requires that an Environmental Impact Report (EIR) contain a statement within the project description briefly describing the intended uses of the EIR. The CEQA Guidelines indicate that the EIR should identify the ways in which the Lead Agency and any responsible agencies would use this document in their approval or permitting processes. The following discussion summarizes the roles of the agencies and the intended uses of the EIR.

The California State Lands Commission (CSLC) is the State agency with jurisdiction and management control over California's sovereign and submerged lands. As such, the CSLC is the Lead Agency in California for preparing the EIR, complying with CEQA (Public Resources Code [PRC] section 21000 *et seq*.), following the guidelines for the implementation of CEQA (California Code of Regulations [CCR] Title 14, section 15000 *et seq*.), and coordinating the review of the EIR by State and local responsible and trustee agencies. These responsible and trustee agencies include the California Department of Fish and Game (CDFG), the Regional Water Quality Control Boards (RWQCBs), the California Department of Transportation (Caltrans), and the local Air Quality Management Districts and Air Pollution Control Districts (AQMDs and APCDs). The EIR will be used by the CSLC to exercise its jurisdictional responsibilities in making its decision to grant a lease for the pipeline river crossing at the Sacramento River.

The proposed Project would also require approvals and/or review by a number of Federal, State, and local agencies as noted in Section 1.4 - Permits, Approvals and Regulatory Requirements.

1.2.1 Organization of EIR

- Section 2.0 - Project Description describes the proposed Project, its location, layout and facilities, and presents an overview of its operation and construction.

- Section 3.0 - Alternatives and Cumulative Projects describes the alternatives to the proposed Project carried forward for analysis, the alternatives that were considered but eliminated from detailed evaluation. This Section also identifies the cumulative projects that will be analyzed.

- Section 4.0 - Environmental Analysis describes existing environmental conditions, Project-specific impacts and mitigation measures, and the impact analysis of the alternatives. This Section also evaluates the impacts of the cumulative projects.

- Section 5.0 - Environmental Justice analyzes the distributional patterns of high-minority and low-income populations on a regional basis and characterizes the distribution of such populations adjacent to the proposed and alternative pipeline corridors and focuses on whether the proposed Project has the potential to adversely and disproportionately affect minority populations and low-income communities, thus creating an inconsistency with the intent of the CSLC environmental justice policy.

- Section 6.0 - Other Required CEQA Sections addresses other required CEQA elements, and describes significant unavoidable environmental effects, irreversible environmental effects, and growth-inducing impacts.

- Section 7.0 - Mitigation Monitoring Compliance Program presents the Mitigation Monitoring Program (MMP).

- Section 8.0 - Report Preparation Sources presents information on the qualifications of those who prepared the report.

- Section 9.0 - References lists reference materials used to prepare the report.

- Section 10.0 - List of Acronyms and Abbreviations includes a list of acronyms and abbreviations used in the report.

- Appendix A to this Draft EIR contains the mailing list.

- Appendix B to this Draft EIR contains the Notice of Preparation (NOP), copies of comments received on the NOP, transcripts of public meetings regarding the NOP, and the location in the Draft EIR where comments are addressed.

- Other technical appendices are also included in this Draft EIR.

1.2.2 Study Area Boundary

The Study Area for this Project includes the proposed pipeline route and permanent easement areas, from the tie-in location with Line 401, north of Capay in Yolo County to the existing PG&E Line 123 in the City of Roseville. The Study Area also extends south along Powerline Road to the Sacramento Metro Air Park. The Study Area would also include temporary work areas necessary for construction of the

Project as well as those adjacent areas that may be affected by pipeline upsets as identified in Section 4.7, Hazards and Hazardous Materials. Section 2, Project Description, describes and illustrates the limits of the Study Area in more detail.

1.2.3 Definition of Baseline and Future Conditions

The CEQA Guidelines (section 15125(a)) require a description of the existing environmental setting in order to examine and analyze the effects of the proposed Project on the environment. This EIR analyzes the environmental impacts associated with installation and operation of the Project extending from Yolo County, just west of Yolo CR-85 and north of Capay and Cache Creek, to existing Line 123 in the City of Roseville. This EIR examines the impact on the existing environment of constructing and operating the Project for the design life of the pipelines (50 years).

1.3 PUBLIC REVIEW AND COMMENT

1.3.1 Scoping

The CSLC, as Lead Agency in accordance with the provisions of CEQA, determined that the proposed Project may result in potentially significant adverse environmental impacts, and therefore required preparation of this Draft EIR pursuant to and in accordance with CEQA (Public Resources Code, section 21000 et seq.), the CEQA Guidelines (California Code of Regulations, Title 14, Chapter 3, section 15000 et seq.), and the CSLC's guidelines implementing CEQA.

On June 19, 2007, pursuant to the CEQA Guidelines (sections 21080.4 and 15082(a)), the CSLC provided a Notice of Preparation (NOP) for the proposed Project to responsible and trustee agencies and to other interested parties. The NOP solicited both written and verbal comments on the EIR’s scope during a 30-day comment period and provided information on a forthcoming public scoping meeting. The CSLC held four public and agency scoping meetings, two in Woodland, California on July 9, 2007, and two in Roseville, California on July 10, 2007, to solicit verbal comments on the scope of the EIR. Verbal comments were made at the scoping meetings and the associated transcripts are included in Appendix B. Written comments were received in response to the NOP from the following (listed in the order received):

- U.S. Department of Agriculture, Natural Resource Conservation Service, Phil Hogan;

- Yolo-Solano Air Quality Management District, Mathew R. Jones;
- Yolo County Farm Bureau, Joe F. Martinez;
- William L. Dibble, Property Owner;
- Wildlands, Inc., Brian Monaghan;
- Wildlands, Inc., Jeff Mathews;
- Michael R. Valentine, Property Owner;
- U. S. Fish and Wildlife Service, Kenneth Sanchez;
- RSC Engineering, Richard S. Chavez;
- Wirth Real Estate/Valuation Services, Robert B. Wirth, Jr.;
- Placer County Office of Education, Matt Shawver;
- Placer County Flood Control and Water Conservation District, Andrew Darrow;
- Placer County Community Development Resources Agency, Andrew Gaber;
- Howard Lopez, Property Owner;
- Yolo County Board of Supervisors, Duane Chamberlain;
- Robert B. and Vesta E. Wirth Revocable Trust, Doug Wirth;
- Department of Energy, Western Area Power Administration, Heidi R. Miller;
- Department of Conservation, Dennis J. O'Bryant;
- Department of Water Resources, Floodway Protection Section;
- City of Roseville, Mark Morse;
- George M. Carpenter, Attorney at Law;
- Atkinson, Andelson, Loya, Ruud & Romo / Attorneys for Center Unified School District, Elizabeth B. Hearey; and
- Hefner, Stark & Marois, Martin B. Steiner.

A copy of the NOP, scoping meeting transcripts, and comment letters received, as well as an index of where such written comments are addressed in the document, are included in Appendix B.

1.3.2 Public Comment on the Draft EIR

This Draft EIR is being circulated to Federal, State, and local agencies and to interested individuals who may wish to review and comment on the report. Written comments may be submitted to the CSLC during the 45-day public review period. Verbal and written comments on this Draft EIR will be accepted at a noticed public meeting (either noticed in this document or separately). All comments received will be addressed in a Response to Comments addendum document, which, together with this Draft EIR, will constitute the Final EIR for the proposed Project.

This Draft EIR identifies the environmental impacts of the proposed Project on the existing environment, indicates how those impacts would be mitigated or avoided, and identifies and evaluates alternatives to the proposed Project. This document is intended to provide the CSLC the information required to exercise its jurisdictional responsibilities with respect to the proposed Project, which would be considered at a separate noticed public meeting of the CSLC.

The CEQA requires that a Lead Agency shall neither approve nor implement a project as proposed unless the significant environmental impacts have been reduced to an acceptable level. An acceptable level is defined as eliminating, avoiding or substantially lessening significant environmental effects to below a level of significance. If the Lead Agency approves the project, even though significant impacts identified in the Final EIR cannot be fully mitigated, the Lead Agency must state in writing the reasons for its action. Findings and a Statement of Overriding Considerations (SOC) must be included in the record of project approval and mentioned in the Notice of Determination (NOD).

1.4 PERMITS, APPROVALS, AND REGULATORY REQUIREMENTS

In addition to action by the CSLC, the proposed Project will require permits or approvals from the following reviewing authorities and regulatory agencies:

- U.S. Army Corps of Engineers (USACE);
- U.S. Fish and Wildlife Service (USFWS);
- National Oceanic and Atmospheric Administration (NOAA) Fisheries;

- Central Valley Regional Water Quality Control Board (CVRWQCB);
- California Department of Fish and Game (CDFG);
- California Department of Transportation (Caltrans);
- State Reclamation Board;
- Feather River Air Quality Management District (FRAQMD);
- Sacramento Metropolitan Air Quality Management District (SMAQMD);
- Placer County Air Pollution Control District (PCAPCD);
- Yolo-Solano Air Quality Management District (YSAQMD);
- Yolo County Flood Control and Water Conservation District;
- Placer County Flood Control and Conservation District;
- City of Roseville;
- Sacramento, Yolo, Placer, and Sutter Counties; and
- Reclamation Districts 730, 1000, 1600, and 2035.

2.0 PROJECT DESCRIPTION

2.1 INTRODUCTION

Pacific Gas and Electric Company (PG&E) is proposing to construct and operate multiple natural gas transmission pipelines that would ultimately cross California's Central Valley in the counties of Yolo, Sutter, Sacramento, and Placer. The "proposed Project" or "Project" would involve the construction and operation of three new transmission pipelines: Line 406, Line 407 (West and East), and the Powerline Road Distribution Feeder Main (DFM). The Project would also include the construction of six aboveground facilities. Fully constructed, the pipelines would span the lower Sacramento Valley.

Project construction would involve a combination of conventional trenching, horizontal directional drilling (HDD), and conventional boring techniques such as hammer boring and auger boring/jack-and-boring. Conventional trenching involves installation of the pipe within an open trench followed by backfilling. The HDD construction technique uses a hydraulically-powered horizontal drilling rig to tunnel under vertically and/or horizontally-large sensitive surface features such as water courses, levees, and wetlands. Hammer boring is a non-steerable pipeline construction technique that drives an open-ended pipe for short distances under surface features such as roads or smaller water features. For this construction method, pits are required on either side of the surface feature to be avoided. Auger boring/Jack-and-boring consist of installing a pipe simultaneously with the excavation process. Section 2.5, Construction Procedures, provides detailed descriptions of these and other pipeline construction techniques that would be used in conjunction with the proposed Project's installation.

The Project traverses four counties within the lower Sacramento Valley from Yolo County, just west of Yolo County Road (CR) 85, and extends approximately 40 miles east to the City of Roseville, Placer County. Figure 2-1 provides a regional orientation of the Project and broadly identifies the geographic area traversed by the Project. In general, the Project crosses a combination of flat to undulating and rolling hill topography with corresponding elevations ranging from approximately 15 to 255 feet above mean sea level (msl) (PG&E 2007a). The locations of each of the three pipelines and the DFM are described individually below. Figure 2-2 provides an overview of the Project.

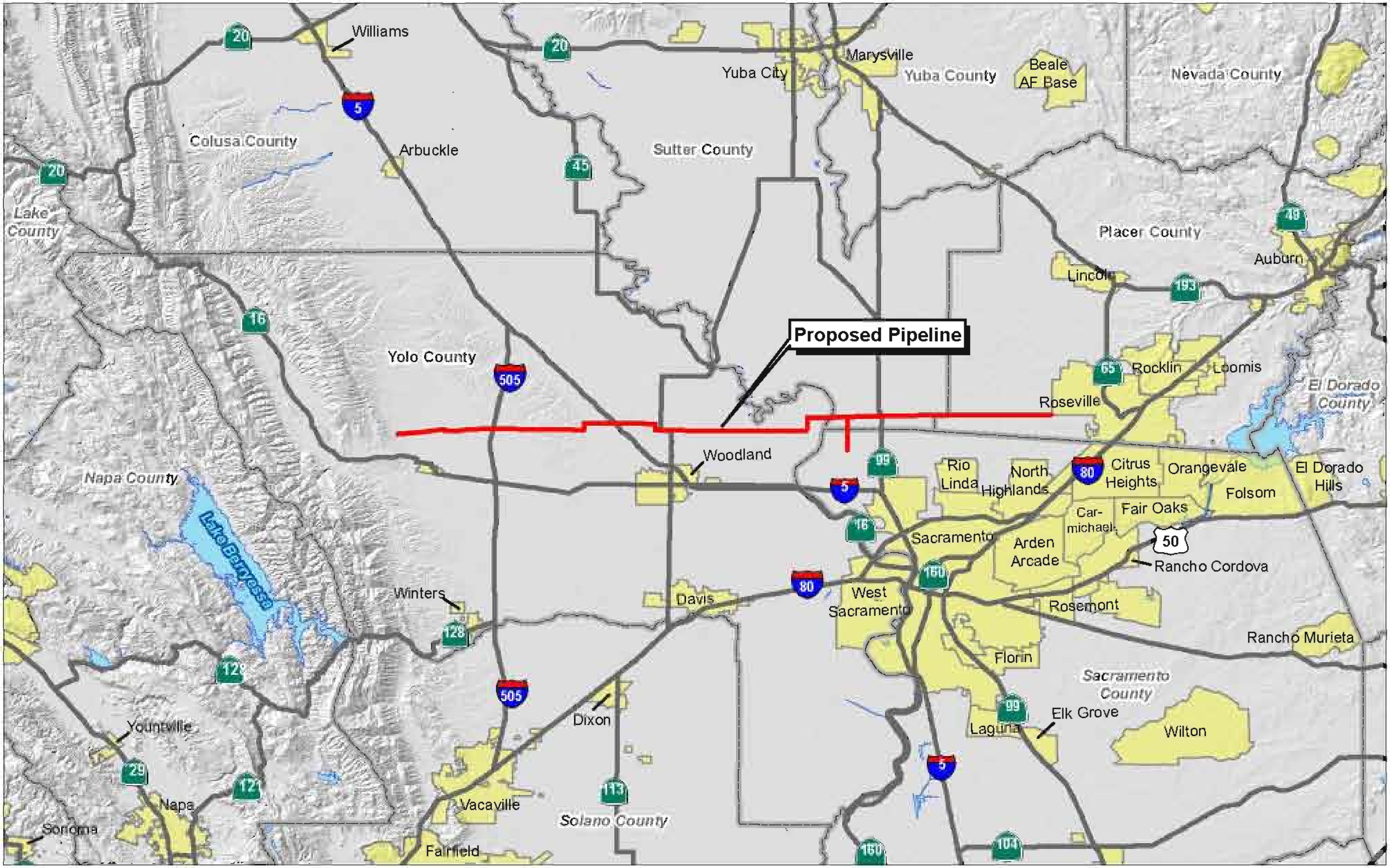
Line 406 would begin at PG&E's existing Lines 400 and 401 in Yolo County at the foot of the Coast Range and extends east to Line 172A, near the town of Yolo (Figure 2-3). From Lines 400 and 401, Line 406 traverses east across agricultural fields to CR-87, where it extends south for a short distance to a point just north of the intersection with CR-19. The route then proceeds east under CR-87 and across more agricultural fields to Interstate (I) 505. After crossing under I-505, the route parallels CR-17 through the Dunnigan Hills and at I-5, the pipe crosses via HDD and continues east to a tie-in point with Line 172A and Line 407 West, just north of the town of Yolo.

Line 407 is divided into two major segments, **Line 407 West** (407-W) and **Line 407 East** (407-E), and extends from Line 172A near the town of Yolo to existing Line 123 near the City of Roseville (Figures 2-4 and 2-5). The Powerline Road Distribution Feeder Main (DFM) serves as the boundary between Line 407 West and Line 407 East.

Line 407-W would extend east from the tie-in point with Lines 406 and 172A and through agricultural fields to CR-98 (Figure 2-4). At CR-98, the pipeline would cross the roadway and parallel the roadway south to CR-16A where it would then extend east to CR-99A. The alignment would parallel CR-99A south to CR-17, where it would transition back to the east and would continue to the Knights Landing Ridge Cut and across the Yolo Bypass and the Tule Canal. From here, it would jog northeast and north to CR-16 and continue to the Sacramento River crossing. After the Sacramento River crossing, it would parallel Riego Road until Powerline Road.

Line 407-E would extend east from the junction of 407-W at Powerline Road along Riego Road, which eventually transitions to Baseline Road, through Sutter and Placer counties (Figure 2-5). The route would cross State Route (SR) 70/99, and a number of irrigation canals, including the North Drainage Canal and the Natomas East Main Drainage Canal (Steelhead Creek). At its eastern extent, 407-E would parallel the northern border of the Placer Vineyards Specific Plan area on the north side of Baseline Road before connecting with Line 123 at the intersection of Baseline Road and Fiddyment Road.

The Powerline Road Distribution Feeder Main (DFM) would extend from the connection point with 407-W and 407-E south along Powerline Road to the Sacramento Metro Air Park development in Sacramento County (Figure 2-6). This route would parallel Powerline Road between Riego Road in Sutter County and West Elverta Road in Sacramento County.



Source: Adapted from PG&E 2007.

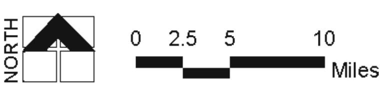


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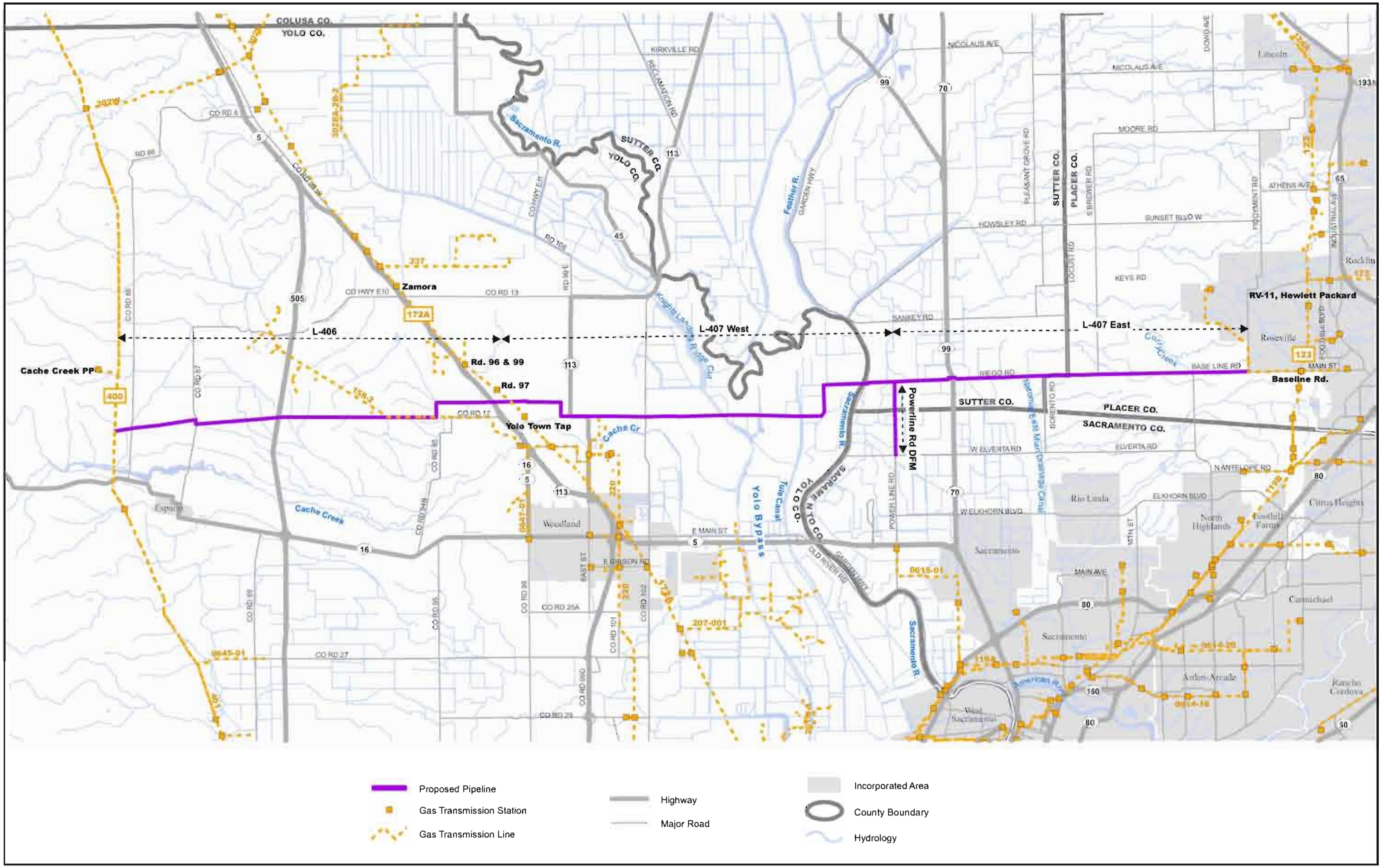
Figure 2-1
Regional Location



Source: PG&E, March 2009.

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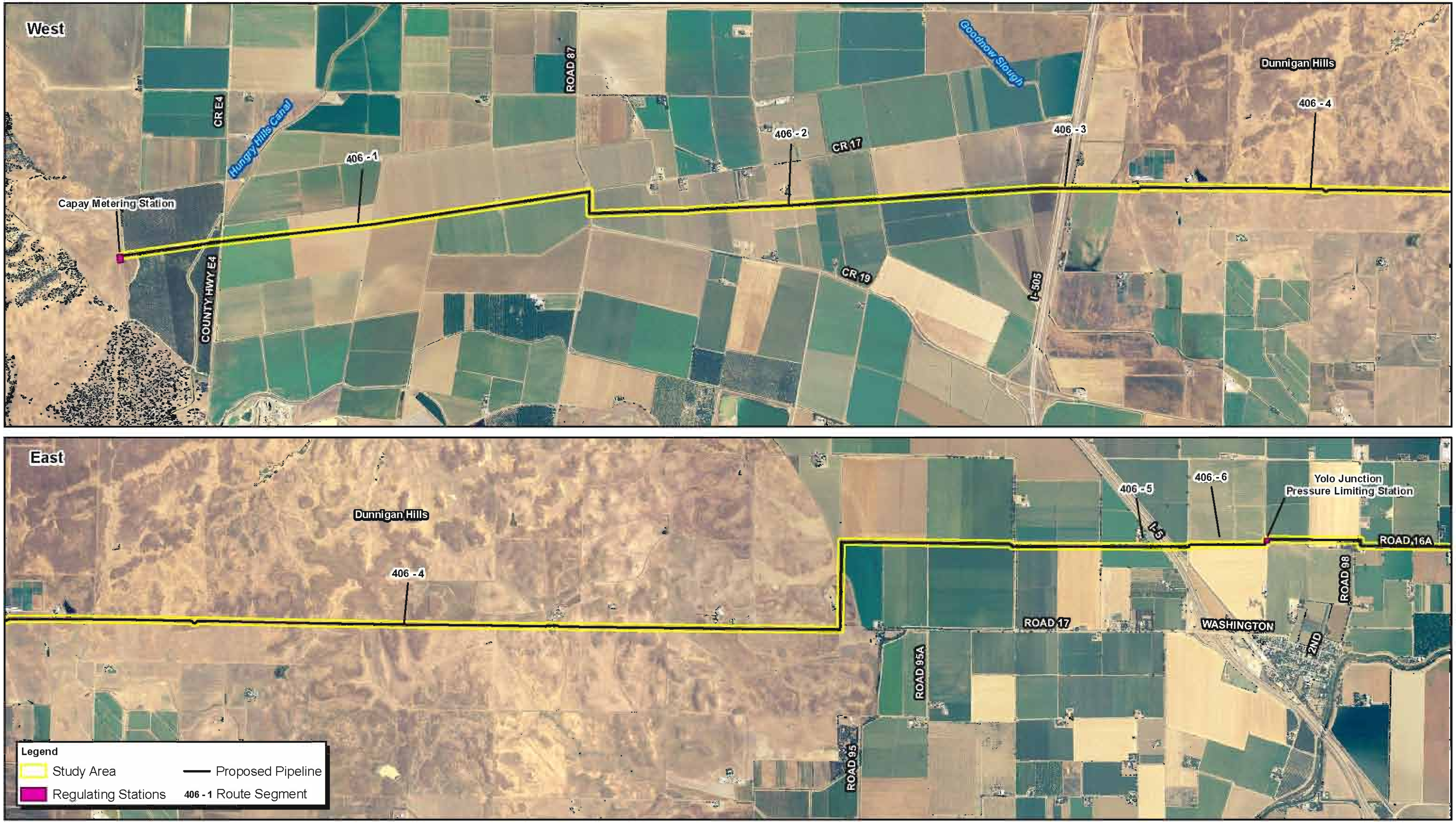
Figure 2-2
Project Overview



Source: Adapted from PG&E 2007, and USDA NAIP Yolo County 2005.

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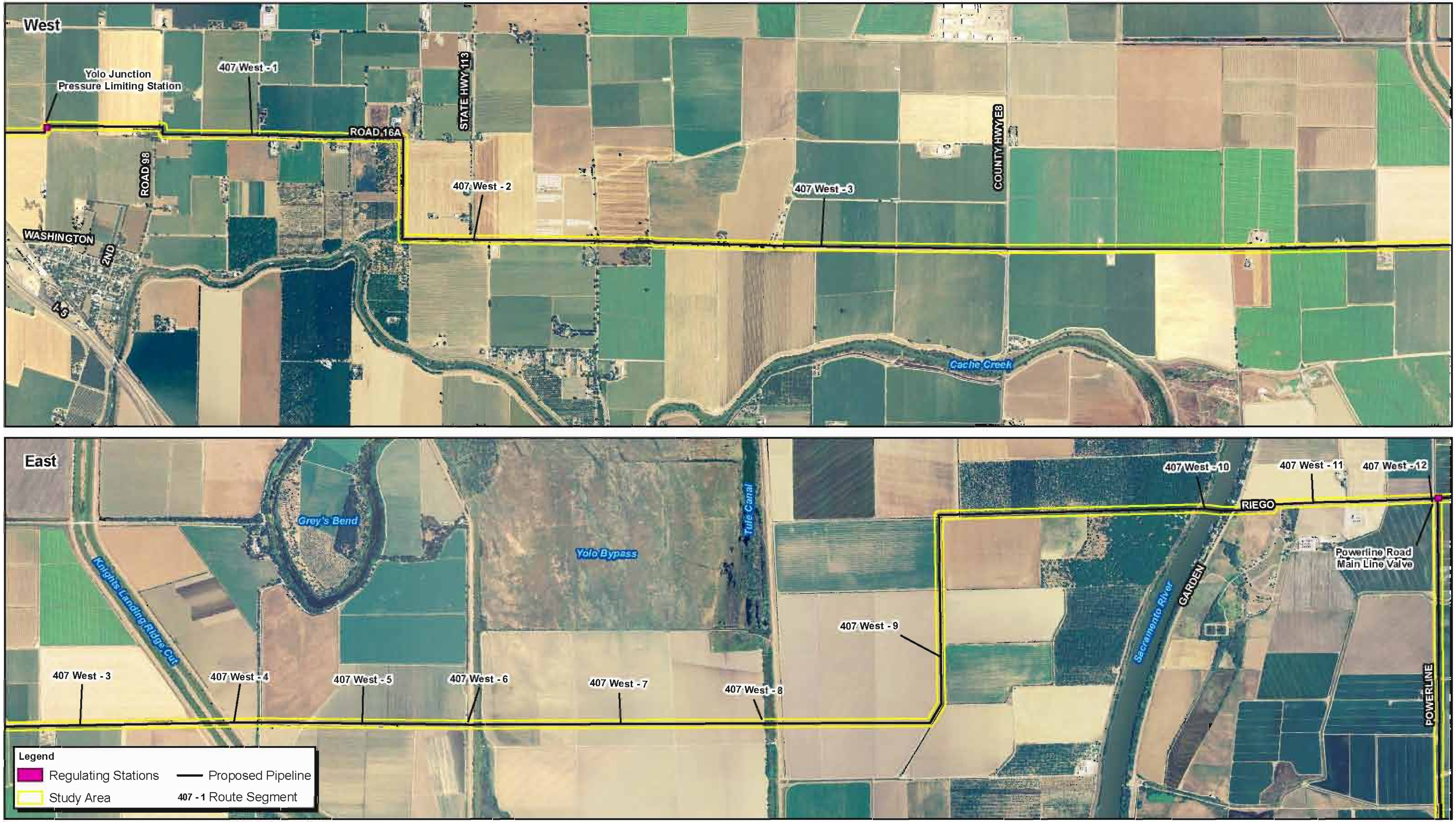
NORTH

0 0.25 0.5 1 Miles

Figure 2-3
Line 406 Alignment and Study Area



Source: Adapted from PG&E 2007, and USDA NAIP Yolo County 2005.

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NORTH

0 0.25 0.5 1 Miles

Figure 2-4
Line 407 West Alignment and Study Area

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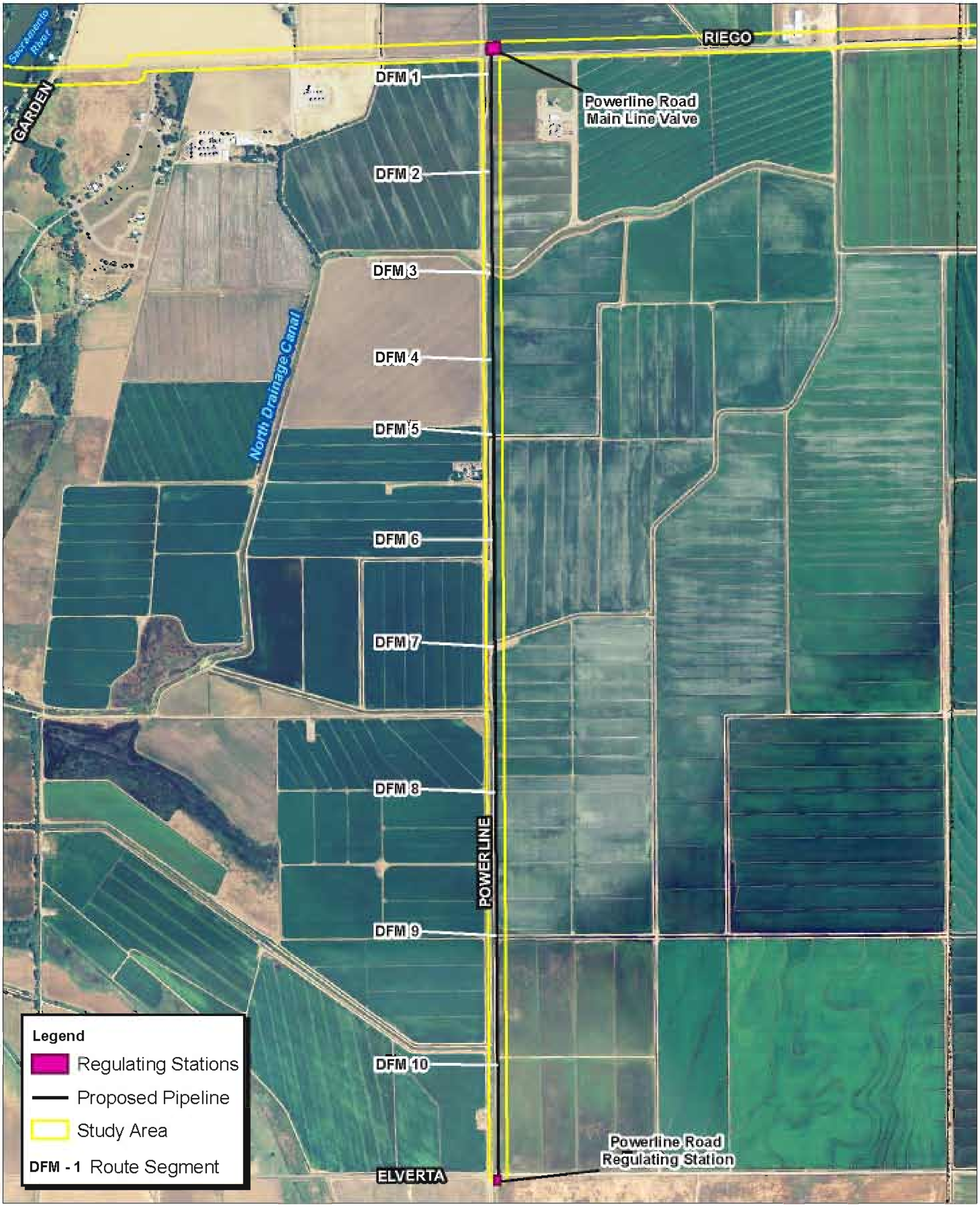
Source: Adapted from PG&E 2007, and USDA NAIP Yolo County 2005, Placer County 2005 .

Figure 2-5
Line 407 East Alignment and Study Area



Source: Adapted from PG&E 2007, USDA NAIP Yolo County 2005, Placer County 2005.

Figure 2-6
DFM Alignment and Study Area

2.2 PROJECT BACKGROUND

2.2.1 Project History

Existing natural gas pipelines in the Project region include Line 400 and Line 401 at the western end of proposed Line 406; Line 158-2 which intersects and then parallels Line 406; Line 172A at the junction of proposed Line 406 with Line 407 West; Line 0647-01 and Line 220 south of the proposed Line 406 and Line 407 West; Line 302W, Line 302EA-2B-2, and Line 337 north of proposed Line 406; and Line 123 at the tie-in with proposed Line 407 East. Currently, there are no PG&E facilities along the proposed Project route.

2.2.2 California State Lands Commission Lease Boundary and Regulatory Boundary Areas

The California State Lands Commission (CSLC) is the State agency with jurisdiction and management control over California's sovereign and submerged lands. The EIR will be used by the CSLC to exercise its jurisdictional responsibilities in making its decision to grant a lease for the pipeline river crossing at the Sacramento River. The Sacramento River crossing would be completed using HDD construction methods for approximately 1,400 feet beneath the River.

2.3 PROPOSED FACILITIES

The Project would add a new major connection point to Lines 400 and 401, the Capay Metering Station, approximately 15 miles south of the Buckeye Pressure Limiting Station. From this connection point, the Project would construct a large-diameter (30-inch) transmission pipeline across the lower Sacramento Valley, essentially bisecting the existing loop. The Project would connect to existing Line 172 and Line 123 to further reinforce the reliability of the region's natural gas system by providing a second large-diameter connection point between Lines 400 and 401 and existing pipelines serving the area.

2.3.1 Pipeline Facilities

The proposed Project would be designed, constructed, operated, and maintained in accordance with all applicable requirements included in the U.S. Department of Transportation (DOT) regulations in 49 Code of Federal Regulations (CFR) 192, "Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards." The proposed Project would also be subject to California Public Utilities Commission (CPUC) standards as embodied under General Order 112E.

With the exception of the 10-inch DFM, all portions of Lines 406, 407-W, and 407-E would be 30 inches in diameter. The proposed pipeline traverses several different class locations, requiring different wall thickness of steel pipe (Grade X-60) designed for a Maximum Allowable Operating Pressure (MAOP) of 975 pounds per square inch gauge (psig). The 10-inch DFM would be designed for a MAOP of 500 psig to 975 psig. Industry standards for pipeline sections installed via Horizontal Directional Drill (HDD) technology require a pipe diameter to wall thickness ratio (D/t) of 50 or below. Refer to Table 2-2 for pipe wall thickness specifications required in each class location.

Gas would flow east from the Line 400/401 to the Baseline Road Pressure Regulating Station. The 30-inch diameter pipeline would be located within a 50-foot private, permanent right-of-way (ROW), to provide PG&E with the necessary control over future construction activities in and around the line to ensure safe and uninterrupted operation of the pipeline. Because the cover requirements referenced in the DOT code are minimums, the Gas Pipeline Technical Committee (GPTC) Guide Material Appendix G-192-13 has been applied to the Project and is described in Table 2-1. The DOT Code of Federal Regulations 49 Part 192.327 establishes minimum cover requirements at 30 inches for transmission pipelines in Class 1 and 36 inches in Classes 2, 3, and 4. PG&E has increased the cover beyond minimum requirements to 5 feet because its past experience has demonstrated that it is sufficient to eliminate most threats from agricultural operations. Excavations in excess of 5 feet present additional construction challenges (and cost) due to the need for trench benching or shoring for worker entry. Maintaining the cover on the pipe at approximately 5 feet will reduce the impact on farming operations. The depths being proposed in Table 2-1 go beyond requirements in order to accommodate for land uses. Use restrictions required in the permanent easement would prohibit the planting of deep-rooted plants, such as trees or vines within 15 feet of the pipeline centerline for protection of the pipeline, but other agricultural uses would be allowed.

Table 2-1: Depths to Cover

Location	Regulation Requirements Depth (ft)*	Proposed Depth (ft)	Justification	Agricultural Restrictions
Agriculture	3	5	Added cover to prevent damage from outside forces (DOF)** from farming operations.	Limited to crops with shallow root system, prohibits tree crops, orchards, and vineyards
Drainages	3	5	Prevention of DOF due to maintenance.	
Irrigation Canals	3	5	Prevention of DOF due to canal maintenance.	
Road Crossings	3	5	Prevention of DOF due to road maintenance.	
Highway Crossings	7.5	7.5	Prevention of DOF and to meet Cal Trans requirements for uncased crossings.	
Water Crossings	35	35 to 60	Prevention of unintentional drill mud release and to meet CSLC minimum depth requirements.	None

* Regulations used include 49 CFR 192, American Petroleum Institute section 1102, General Order 112E, and Caltrans requirements.

** Damage from outside forces (DOF) include impact by mechanical equipment, such as bulldozers and backhoes; earth movements due to soil settlement, washouts, or geological hazards; weather effects, such as winds, storms, and thermal strains; and willful damage.

Source: 49 CFR 192; PG&E 2008.

Pipeline Wall Classifications

The standards in the Federal regulations are more stringent for pipelines placed near high human population densities. Federal DOT regulations define area classifications, based on population density of the pipeline vicinity and on an area that extends for 660 feet (220 yards) on either side of the centerline of any continuous one-mile length of the pipeline. The four area classifications are defined as:

- **Class 1**: A location with ten or fewer buildings intended for human occupancy;
- **Class 2**: A location with more than ten but less that 46 buildings intended for human occupancy;

- **Class 3**: A location with 46 or more buildings intended for human occupancy or where the pipeline lies within 300 feet (100 yards) of any building or small well-defined outside area occupied by 20 or more people during normal use; and
- **Class 4**: A location where buildings with four or more stories aboveground are prevalent.

Class locations representing more populated areas require higher safety factors in pipeline design, testing, and operation. In addition to population density, other factors are used to determine the design factor used within a class location. A higher safety factor must be used in the design formula for steel pipelines that: (a) cross the ROW of an unimproved public road, without a casing; or (b) cross without a casing, or makes a parallel encroachment on the ROW of a hard-surfaced road, a highway, a public street, or a railroad. The design specifications for each of the pipeline area classes included as part of the Project are provided in Table 2-2.

Table 2-2: Pipeline General Area Class Specifications

Pipeline Attribute	Class 1	Class 2	Class 3	DFM	HDD
Outside Diameter	30-inch	30-inch	30-inch	10-inch	30-inch
Grade	65,000	65,000/60,000[3]	60,000	60,000	65,000
Wall Thickness	0.375	0.406/0.438[3]	0.500	0.250	0.625
Seam Type[1]	DSAW	DSAW	DSAW	DSAW	DSAW
Maximum Allowable Operating Pressure	975 psig	975 psig	975 psig	500-975 psig	975 psig
Percent SMYS at MAOP	60.0%	55.4%/55.7%	48.8%	40.0%	36.0%
Maximum Operating Pressure (psig)	975	975	975	975	975
Normal Operating Pressure (psig)	625 to 975	625 to 975	625 to 975	500 to 975	625 to 975

Pipeline Attribute	Class 1	Class 2	Class 3	DFM	HDD
Minimum Operating Pressure (psig)	625	625	625	500	625
ANSI Rating[2]	ANSI 600	ANSI 600	ANSI 600	ANSI 600	ANSI 600

[1] DSAW - Double Submerged Arc Welding.
[2] ANSI - American National Standards Institute.
[3] Second values are for Alternate Class 2 Specifications
Source: PG&E 2008.

Figure 2-7 illustrates the pipeline area classifications along the proposed route. As shown, the pipeline would be Class 1 through much of Yolo County given the predominately agricultural zoning. The exception to this occurs along the I-5 and I-505 corridors and north of the communities of Yolo and Woodland, which are designated as Class 2. Portions of the alignments east of the Sacramento River are designated Class 3 in response to planned growth associated with the Placer Vineyards, Sutter Pointe Specific Plan, Sacramento Metro Air Park, and Sierra Vista projects.

Valve Spacing

Valve locations are shown in Figure 2-7. Valve spacing was determined by applying DOT 49 CFR section 192.179 (October 1, 2006) which states:

Each transmission line, other then offshore segments, must have sectionalizing block valves spaced as follows, unless in a particular case the Administrator finds that alternative spacing would provide and equivalent level of safety:

- Each point on the pipeline in a Class 4 location must be within 2.5 miles of a valve;
- Each point on the pipeline in a Class 3 location must be within 4 miles of a valve;
- Each point on the pipeline in a Class 2 location must be within 7.5 miles of a valve; and
- Each point on the pipeline in a Class 1 location must be within 10 miles of a valve.

Route Segments

The following sections summarize the route and proposed construction techniques that would be used to install the pipeline by route segment. Each segment of the Line 406, 407, and Powerline Road DFM routes is uniquely coded to better enable consistent cross-referencing throughout the EIR. Figures 2-3, 2-4, 2-5, and 2-6 provide an illustration of the coded route segments, which are described in further detail below and include the following:

- Line 406 (Segments 406-1, 406-2, etc.);
- Line 407 West (Segments 407-W1, 407-W2, etc.);
- Line 407 East (Segments 407-E1, 407-E2, etc.); and
- DFM (Segments DFM-1, DFM-2, etc.).

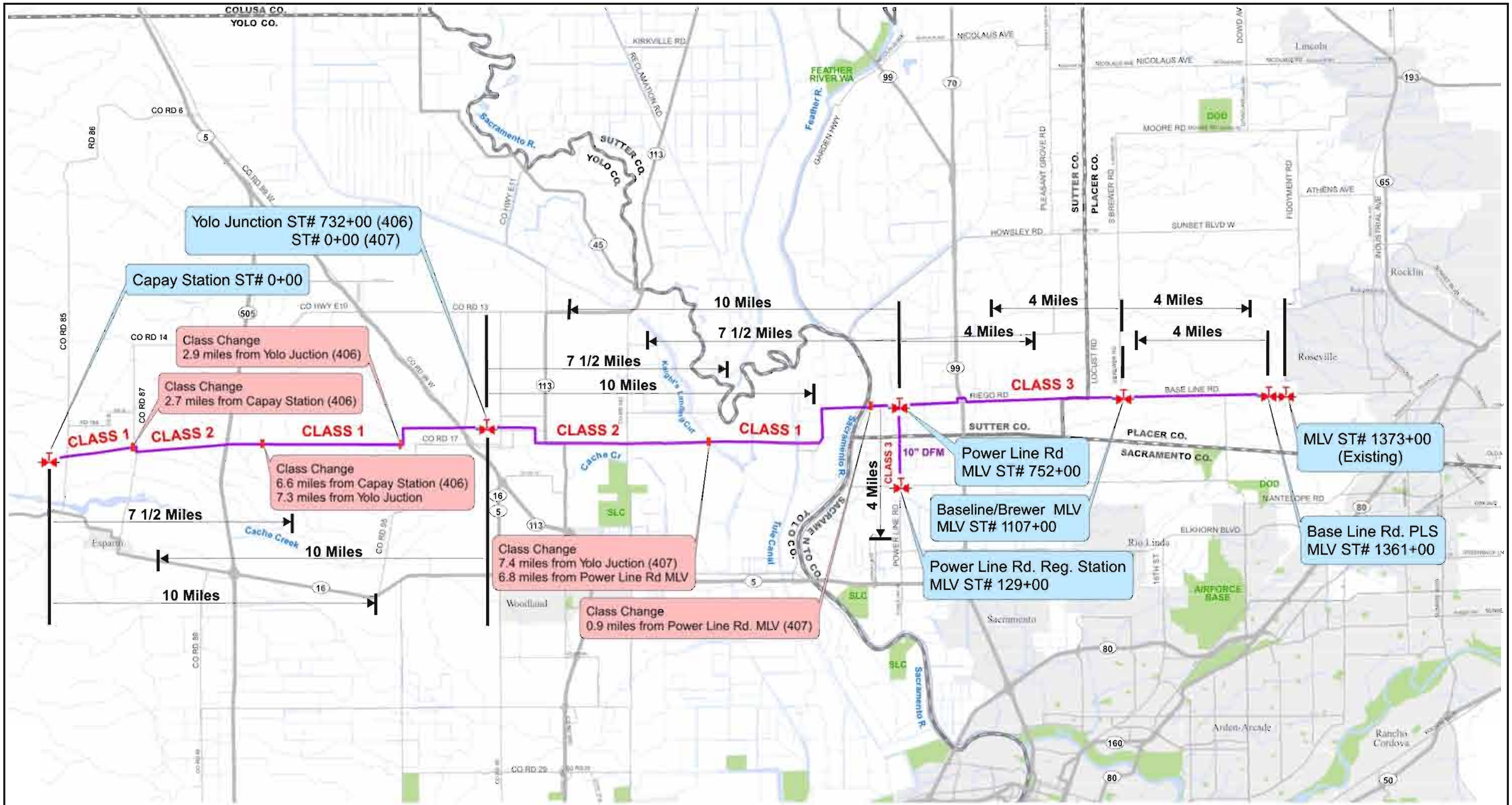
Project-related construction techniques are described in Section 2.5, Construction Procedures.

Line 406

Line 406 (Figure 2-3) would consist of approximately 14 miles of 30-inch-diameter gas transmission pipeline operating at a MAOP of 975 psig, and transporting up to 475,000,000 cubic feet of natural gas per day between existing Lines 400 and 401 and existing Line 172A in Yolo County (PG&E 2007a). The proposed in-service date is February 2010. The Line 406 route is subdivided into six segments that are described in more detail below.

Segment 406-1

Segment 406-1 would begin at Lines 400 and 401, approximately 2.5 miles northwest of the community of Esparto and 0.5 miles east of CR-85. The segment extends approximately 2.75 miles between the Line 400 and 401 tie-in and CR-87. From the proposed Capay Metering Station, at the Line 400 and 401 tie-in, the pipeline heads east-northeast roughly parallel with the agricultural parcel boundaries, crossing under Hungry Hollow Canal and CR-85 (also called County Highway E-4) and ends just northwest of the intersection of CR-87 and CR-19.



Legend

- Class Change
- Main Line Valve
- Major Road
- Highway

Note

Each point on pipeline in a Class 1 Location must be within 10 Miles from a valve.
Each point on pipeline in a Class 2 Location must be within 7 1/2 Miles from a valve.
Each point on pipeline in a Class 3 Location must be within 4 Miles from a valve.

Source: PG&E, March 2009.

NORTH

4.5 2.25 0 4.5 Miles

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Figure 2-7
Pipeline Area Classifications

One of the conventional boring construction techniques would be used at the Hungry Hollow Canal, depending on whether construction takes place when the canal is transporting irrigation water.

Approximately 1 mile east of CR-85, the segment would run parallel to the south bank of an agricultural irrigation (ditch/canal) to the junction of CR-87 and CR-17. At CR-87, the pipeline turns south and extends approximately 925 feet on the west side of CR-87. Except for the Hungry Hollow Canal Crossing, Segment 406-1 would be a Class 1 pipeline. All county road crossings would be bored using one of the conventional boring techniques described in this Section, per county requirements.

Segment 406-2

From the end of Segment 406-1, the pipeline would continue to extend east and would cross under CR-87. East of CR-87, the pipeline would cross approximately 2.6 miles of agricultural land, including crossing under an irrigation canal. This segment would be a Class 2 pipeline.

Segment 406-2 would end just west of I-505 across from the I-505/CR-17 intersection.

Segment 406-3

Segment 406-3 would consist of approximately 1,050 feet of pipeline that travels under I-505, CR-90A and Goodnow Slough to the south side of the intersection of CR-90A and CR-17. This segment would be installed using HDD and would be a Class 2 pipeline.

Segment 406-4

After crossing under I-505, the pipeline route would parallel the south side of CR-17 for approximately 5.3 miles before turning north at the east end of the Dunnigan Hills. The pipeline would be Class 2 from I-505 to approximately 1 mile east of I-505. At that point, the pipeline would become a Class 1 pipeline until the turn approximately 5.3 miles east of I-505.

Just before turning north, the pipeline would change from a Class 1 pipeline to a Class 2 pipeline. Segment 406-4 would cross north under CR-17 and then transition north for approximately 2,500 feet before resuming in an easterly direction. East of the transition, Segment 406-4 would parallel the south side of unnamed farm roads. At CR-96, the segment would extend under CR-96 and an irrigation canal using one of the conventional boring techniques for approximately 150 feet and continue east. Segment 406-4 ends approximately 3,000 feet east of CR-96.

Segment 406-5

Segment 406-5 would be a Class 2 pipeline installed by HDD. The segment would extend east for approximately 1,050 feet, crossing under I-5 and CR-99W, ending approximately 200 feet west of CR-97. The HDD would end just before crossing CR-97.

Segment 406-6

East of I-5, Line 406 would continue east as a Class 2 pipeline for approximately 0.75 miles, traveling parallel to the south side of an unnamed farm road to a tie-in point with the existing Line 172A and proposed Line 407 West at the proposed Yolo Junction Pressure Limiting Station.

Line 407 West

Line 407 West, as described in Section 2.1 and as shown in Figure 2-4, would consist of approximately 13.5 miles of 30-inch diameter pipeline operating at 975 psig and transporting up to 180,000,000 cubic feet of natural gas per day between Line 172A and the tie-in with Line 407 East near the intersection of Powerline Road and Riego Road in Sutter County. All segments of the pipeline discussed below would be installed using one of the conventional boring techniques. Line 407 West is subdivided into twelve segments that are described in more detail below.

Segment 407-W1

Beginning at the tie-in point with proposed Line 406 and existing Line 172A near I-5, Segment 407-W1 would extend east through agricultural fields to CR-98. The segment would cross under CR-98. The pipeline would then extend south along the east side of CR-98 until the CR-16A intersection. At the intersection, the pipeline would resume east along the north side of CR-16A for over 1 mile to CR-99A. Just northeast of the intersection of CR-16A and CR-99A, the segment would turn south to cross from north CR-16A to the south.

South of CR-16A, the pipeline would extend south paralleling the east side of CR-99A to CR-17. At CR-17, Segment 407-W1 resumes extending east along the north side of CR17 until just west of the junction of State Route (SR) 113 and CR-17. All of Segment 407-W1 would consist of Class 2 pipeline.

Segment 407-W2

Segment 407-W2 would consist of an approximately 300 foot crossing (using one of the conventional boring techniques) east under SR 113 just north of the junction of SR 113 and CR-17. All of Segment 407-W2 would be a Class 2 pipeline.

Segment 407-W3

East of the junction of SR 113 and CR-17, Segment 407-W3 begins and extends approximately 4.3 miles east along the north side of CR-17, crossing under CR-100, CR-101, and CR-102. At the intersection of CR-17 and CR-103, the pipeline would cross south under CR-17 and resume in an easterly direction along the south side of CR-17. The segment would end west of the Knights Landing Ridge Cut. Segment 407-W3 would be a Class 2 pipeline.

Segment 407-W4

This segment would extend east under the first Knights Landing Ridge Cut using HDD techniques for approximately 2,400 feet. Segment 407-W4 would end approximately 1,200 feet east of the Knights Landing Ridge Cut bank, on the north side of an unnamed farm road. Segment 407-W4 would be a Class 1 pipeline.

Segment 407-W5

Starting approximately 1,200 feet east of the Knights Landing Ridge Cut, Segment 407-W5 would extend east and parallels the north side of an unnamed farm road. The segment would extend east approximately 1 mile before ending west of the western levee of the Yolo Bypass. Segment 407-W5 would be a Class 1 pipeline.

Segment 407-W6

Segment 407-W6 would extend east approximately 1,200 feet, crossing under the western levee of the Yolo Bypass. This segment would be installed via HDD methods. Segment 407-W6 would be a Class 1 pipeline.

Segment 407-W7

Segment 407-W7 would extend east from the western levee of the Yolo Bypass under agricultural fields for approximately 1.2 miles. This segment would end west of the eastern levee of the Yolo Bypass and Tule Canal. Segment 407-W7 would be a Class 1 pipeline.

Segment 407-W8

Segment 407-W8 would consist of an approximately 1,600-foot pipeline that crosses east under the eastern levee of the Yolo Bypass, the Tule Canal and CR-107. This segment would be installed via HDD methods. Segment 407-W8 would be a Class 1 pipeline.

Segment 407-W9

Segment 407-W9 would begin and extend east for approximately 3,300 feet before reaching an irrigation canal where it would then proceed to the north. The pipeline would then continue north to CR-16 and cross under CR-16 via trenching construction methods for approximately 150 feet. Segment 407-W9 would be a Class 1 pipeline.

North of CR-16, Segment 407-W9 would turn back to the east along the north side of CR-16 and cross an existing irrigation canal. This route segment traverses through Sacramento River Ranch Conservation Bank lands and walnut orchards to the west bank of the Sacramento River.

Segment 407-W10

Segment 407-W10 would cross under the Sacramento River, extending approximately 1,400 feet from the west side of the river to the east side via HDD construction methods. East of the Sacramento River, Segment 407-W10 would turn north, crossing under Riego Road for approximately 150 feet and ending on the north side of the road. Segment 407-W10 would be a Class 1 pipeline on the west side of the Sacramento River and a Class 3 pipeline on the east side of the Sacramento River.

Segment 407-W11

Segment 407-W11 would include the installation of a Class 3 pipeline along the north side of Riego Road in Sutter County past the Huffman East, Huffman West, Vestal, and Atkinson Natomas Basin Habitat Conservation tracts. This segment would cross a drainage ditch west of Powerline Road.

Segment 407-W12

Segment 407-W12 would be a Class 3 pipeline installed using one of the conventional boring techniques. The segment would travel for approximately 150 feet along the north side of Riego Road, crossing under Powerline Road, and connecting the previous segment with the Powerline Road DFM and Line 407 East at the proposed Powerline Road Main Line Valve.

Line 407 East

Line 407 East, as described in Section 2.1 and as shown in Figure 2-5, would consist of approximately 12 miles of 30-inch diameter pipeline operating at 975 psig and transporting up to 180,000,000 cubic feet of natural gas per day. Line 407 East would extend east from the junction of 407 West at Powerline Road along Riego Road and Baseline Road, through Sutter and Placer counties before connecting with Line 123 at the intersection of Baseline Road and Fiddyment Road. All segments of the pipeline discussed below would be installed using one of the conventional boring techniques, and would be rated Class 3. Line 407 East is subdivided into nine segments that are described in more detail below.

Segment 407-E1

From the junction of 407 West and the Powerline Road DFM, Segment 407-E1 would extend east along the north side of Riego Road for approximately 1.8 miles before approaching SR 99/70. The segment would include three irrigation canal crossings, each approximately 150 feet wide. Near the western farm road along SR 99/70, Segment 407-E1 extends to the north for approximately 300 feet to line up with the SR 99/70 crossing.

Segment 407-E2

Line 407-E2 would be installed via HDD construction methods under the SR 99/70. Segment 407-E2 spans approximately 1,050 feet from east to west.

Segment 407-E3

East of SR 99/70, Segment 407-E3 would turn south briefly to realign with the north side of Riego Road and then extend east for approximately 2.3 miles. This segment would involve three irrigation canal crossings of approximately 150 feet wide each, and approximately 100 feet of pipeline under Pacific Avenue. Segment 407-E2 would end west of East Levee Road.

Segment 407-E4

Segment 407-E4 would cross approximately 1,200 feet under East Levee Road, the Natomas East Main Drainage Canal (Steelhead Creek), and the Western Pacific

Railroad via HDD installation. This segment would end approximately 350 feet east of Pleasant Grove Road.

Segment 407-E5

Segment 407-E5 would extend east along the north side of Riego Road (which turns into Baseline Road in Placer County) and would cross under Locust Road, Brewer Road and Country Acres Lane. The segment would end approximately 0.4 miles east of Country Acres Lane on the north side of Baseline Road. In addition to bores required by county encroachment permits, one of the conventional boring techniques would be used for the following portions of Segment 407-E5:

- 320 feet in front of a private residence; and
- 475 feet in front of a second private residence.

Segment 407-E6

Segment 407-E6 would consist of an approximately 2,350-foot crossing under vernal pool/vernal swale habitat on the north side of Baseline Road. This segment would be installed via HDD.

Segment 407-E7

Segment 407-E7 would continue east from the end of Segment 407-E6, extending approximately 1.2 miles parallel to the north side of Baseline Road.

Segment 407-E8

Segment 407-E8 would include approximately 1,875 feet of HDD-installed pipe along the north side of Baseline Road. The section would start approximately 900 feet west of the intersection of Baseline Road and Watt Avenue, and would contain the proposed Baseline Road Pressure Regulating Station. This segment would be installed under Curry Creek and a series of vernal pools via HDD.

Segment 407-E9

Segment 407-E9 would extend east along the north side of Baseline Road from the end of 407-E8 to the existing Line 123 at northwest corner of the intersection of Baseline Road and Fiddyment Road.

Powerline Road Distribution Feeder Main (DFM)

The Powerline Road DFM (Figure 2-6) would consist of approximately 2.5 miles of 10-inch-diameter steel pipeline designed to operate at 975 psig and transporting up to 17,000,000 cubic feet of natural gas per day to new land development projects in north Sacramento County. This route would run along the east side of Powerline Road between Riego Road in Sutter County and West Elverta Road in Sacramento County. All segments of the pipeline discussed below would be installed via conventional trenching or one of the conventional boring techniques, and would be a Class 3 pipeline. The Powerline Road DFM route is subdivided into ten segments that are described in more detail below.

Segment DFM-1

From the proposed Powerline Road Main Line Valve, Segment DFM-1 would cross under Riego Road.

Segment DFM-2

Segment DFM-2 would continue south from the previous segment to the north side of an irrigation canal located approximately 2,300 feet south of Riego Road.

Segment DFM-3

This segment would start approximately 2,300 feet south of Riego Road and would extend approximately 300 feet under an existing irrigation canal and would surface on the south side of the canal. HDD techniques would be used to install Segment DFM-3.

Segment DFM-4

Segment DFM-4 would span approximately 1,700 feet between two irrigation canals.

Segment DFM-5

This segment would be installed using one of the conventional boring techniques to allow for the crossing of another irrigation canal approximately 0.8 mile south of the intersection of Riego Road and Powerline Road. The DFM-5 segment would travel approximately 150 feet from the north to the south side of the irrigation canal.

Segment DFM-6

From the southern point of Segment DFM-5, Segment DFM-6 would continue south for approximately 0.4 mile before approaching another irrigation canal.

Segment DFM-7

Segment DFM-7 would be installed using one of the conventional boring techniques to allow for an approximately 150-foot crossing under an irrigation canal.

Segment DFM-8

This segment would consist of approximately 0.6 mile of pipeline between Segment DFM-7 and DFM-9.

Segment DFM-9

This segment of the DFM would cross under an irrigation canal for approximately 200 feet using one of the conventional boring techniques.

Segment DFM-10

The final segment of the DFM pipeline would start at the south end of Segment DFM-9 and travel approximately 0.5 mile south to West Elverta Road. At West Elverta Road, the DFM pipeline would cross to the south side of West Elverta Road. At the southeast corner of West Elverta Road and Powerline Road, the DFM pipeline would tie into the proposed Powerline Road Pressure Regulating Station.

2.3.2 Aboveground Facilities

The Project would include the construction of additional appurtenances necessary for operation of the four line segments (Line 406, Line 407 West, Line 407 East, and the DFM). Six fenced, aboveground pressure limiting, pressure regulating, metering, and main line valve stations would be constructed along the Project alignment to ensure that proper pressures are maintained in the transmission system and to reduce the pressure of the gas before delivering it to the distribution pipeline system (refer to Figure 2-7 for the locations of these stations). These facilities would also require the installation of valve extensions, actuators, valve hand wheels, risers, meters, Supervisory Control and Data Acquisition (SCADA) equipment, and other appurtenances within and adjacent to the stations. Detailed designs of the proposed facilities are not complete at this time; however, the stations would consist of gas regulation and monitoring equipment, which would provide primary and backup routing of gas flow (called runs) through the stations. Lighting at the aboveground facilities would be minimal and would be used in emergencies only, so as not to create a new source of light in the surrounding area.

These stations would consist of the following.

- The Capay Metering Station (CMS) would be constructed at the connection of Lines 400 and 401 and Line 406, and would consist of just under 1 acre and have sides measuring approximately 134 feet, 142 feet, 209 feet, and 285 feet in length. The CMS would be no greater than 10 feet in height. Access would be provided from an existing dirt road that connects with CR-85 to the east. The Capay Station would be fitted with an aboveground spool and blind flange to accept a portable pig launcher. An automatic shutdown valve would be installed at this station. The valve could be operated by Gas Control Operators in the event of an emergency in order to control the flow of gas into Lines 406 and 407. The location of the CMS is provided in Figure 2-3;

- The Yolo Junction Pressure Limiting Station (YJS) would be constructed at the connection of Line 406 and Line 172A near I-5, and would cover an area of approximately 100 feet by 127 feet (12,700 square feet or 0.29 acres). The YJS would be no greater than 5 feet in height. An automatic shutdown valve would be installed at this station. The valve could be operated by Gas Control Operators in the event of an emergency in order to control the flow of gas into Lines 406 and 407. As shown in Figure 2-3, access would be provided by an unnamed farm road from CR-97 on the west;

- The Powerline Road Main Line Valve (PRV) would be constructed at the connection of Line 407 and the 10-inch DFM and would be installed within a yard measuring approximately 100 feet by 100 feet (10,000 square feet or 0.23 acres) at the intersection of Riego Road and Powerline Road. The PRV would also house the Riego Road Regulating Station (RRS), which would regulate gas pressure from Line 407 into the DFM, and would be no greater than 10 feet in height. The facility would include a main line valve, blowdown facilities, pressure regulating equipment, pressure transmitters, gas flow meter, SCACD/telecom equipments, and cathodic protection equipment. As shown in Figures 2-4, 2-5, and 2-6, access would be provided from an existing dirt road that connects with Riego Road to the south;

- The Powerline Road Pressure Regulating Station (PRS) would be constructed at the southern terminus of the DFM at the southeastern corner of Powerline Road and West Elverta Road. The PRS would regulate gas from the DFM into the local 60-psig distribution system. It would be constructed in an area measuring approximately 40 feet by 102 feet (4,080 square feet or 0.09 acres), would be no greater than 10 feet in height, and would include pressure regulating equipment, gas filtration equipment, and SCADA/telecom equipment. As shown in Figure 2-6, access would be provided directly from West Elverta Road;

- The Baseline/Brewer Road Main Line Valve Station (MLV) would be constructed approximately 250 feet west of Brewer Road along Baseline Road. The main line valve is a manually operated 24 inch ball valve with a high head extension. The MLV would require a permanent easement area of approximately 50 feet by 50 feet (2,500 square feet or 0.06 acres). The MLV would be fenced and include two 10 inch blow-off valves located on each side of the MLV; and

- The Baseline Road Pressure Regulating Station (BRS) would be constructed at the connection of Line 407 and Line 123 on the north side Baseline Road between Watt Avenue and Fiddyment Road. The BRS structure would be no greater than 10 feet in height and would require a permanent easement area of approximately 84 feet by 145 feet (12,180 square feet or 0.28 acres). It would regulate gas from Line 407 into Line 123 and would include a main line valve, blowdown facilities, pressure regulating equipment, pressure transmitters, gas flow meter, SCACD/telecom equipments, and cathodic protection equipment. The BRS would be fitted with an aboveground spool and blind flange to accept a portable pig receiver. Access would be provided directly from Baseline Road (Figure 2-5).

Figure 2-8 shows examples of aboveground facilities.

2.4 LAND REQUIREMENTS

2.4.1 Pipeline Rights-of-Way and Additional Construction Work Areas

PG&E proposes a 100-foot-wide temporary use area (TUA) for general pipeline trenching consisting of a 50-foot wide permanent easement and a 50-foot wide temporary construction easement (TCE) to accommodate the equipment needed to lay the 30-inch-diameter pipe in a 3.5- to 5-foot-wide trench, an equipment travel lane, and a spoil pile for the excavated soils (Figure 2-9)

Photo 1: Typical fenced aboveground pipeline valve lot with aboveground portions of valves

Photo 2: Typical aboveground portion of pipeline valve

Source: CSLC 2007.

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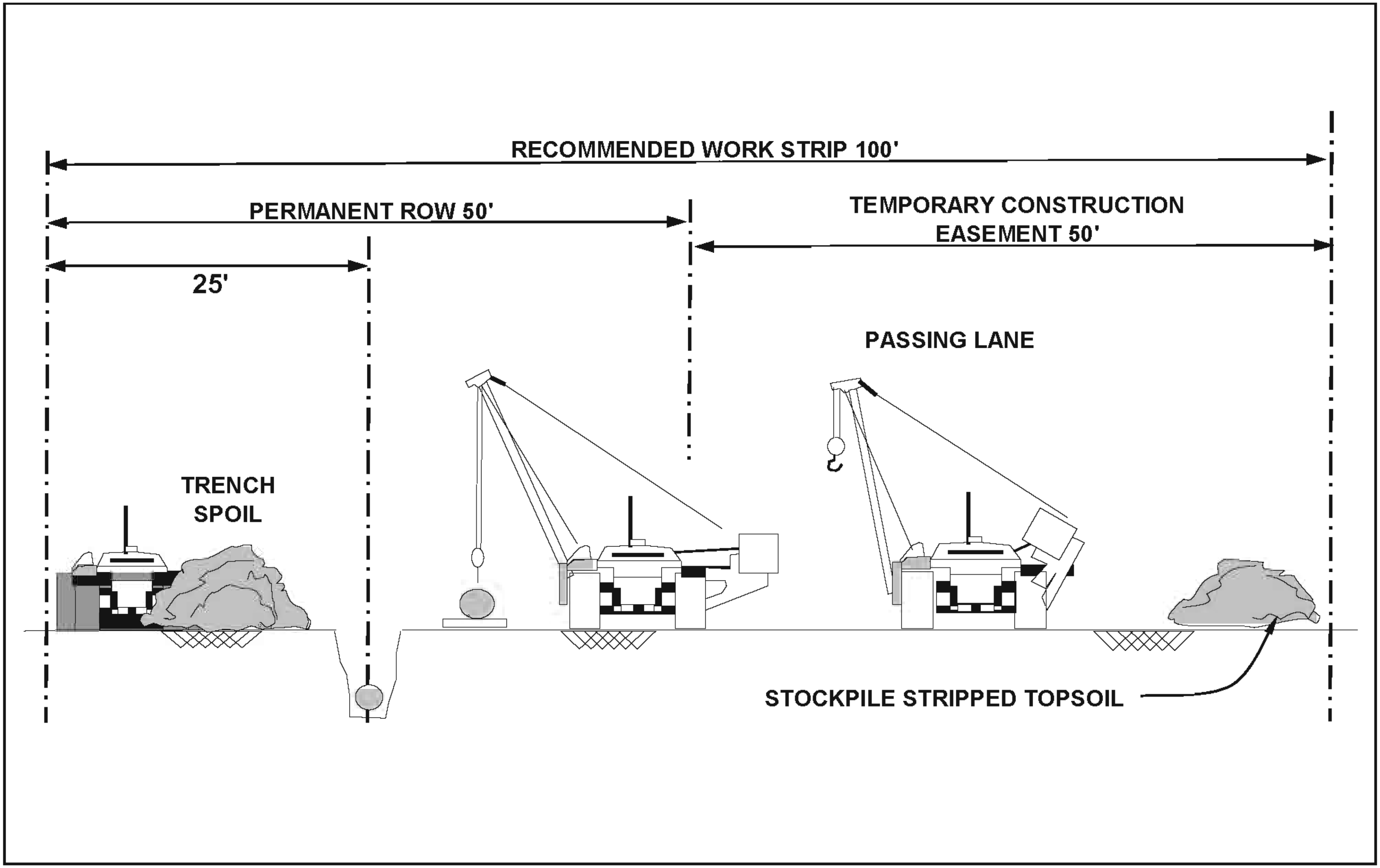
Figure 2-8
Examples of Aboveground Facilities



Source: CSLC 2007.

NOT TO SCALE

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Figure 2-9
100-Foot Construction ROW Configuration

A 60-foot wide TUA would be used for construction in constricted workspaces and would require that excavated soil be transported to an adjacent TUA (see Figure 2-10).

Each of the twelve proposed HDDs would require an additional 18,750-square-foot temporary use area for equipment that would be set up at the proposed entry and exit points (Figures 2-11 and 2-12). The proposed TUA is sufficient for the HDD pull sections, the length of which would be proportional to the HDD length. It is not expected that any of the boring techniques would require areas of additional space beyond the proposed TUA.

PG&E proposes to obtain a 50-foot-wide permanent easement over the new pipeline. It is PG&E's standard policy to obtain 50-foot-wide permanent easements surrounding large-diameter underground pipelines for purposes of pipeline maintenance and to minimize potential damage and disruption to infrastructure if ground-disturbance activity is proposed near the pipeline. The exception to the 50-foot permanent easement occurs along the proposed Powerline Road DMF, where PG&E would acquire a 35-foot permanent easement and an adjacent 25-foot TCE for a total 60-foot-wide TUA (Figure 2-10). The easements would be purchased from the existing landowners, who would also be compensated for PG&E's use of temporary use areas during construction. Restrictions in the easement would prohibit the planting of deep-rooted plants such as trees and vines within 15 feet of the pipeline centerline for protection of the pipeline, but other uses would be allowed.

The primary staging areas for vehicles, equipment, materials, and other supplies required for the construction of the pipeline and regulator stations would be near the Project ROW in existing industrial and commercial yards where accessible. In some cases, materials and/or equipment may be stored on the ROW for short periods. Staging areas would generally be approximately 300 feet by 200 feet.

Additional ROW space may be required in areas such as directionally drilled crossings, bore locations, and as needed for lay-down of Project materials. During HDD operations, up to 75 feet of additional space is typically needed on the drill entry side, adjacent to the ROW, for a length of 250 feet for the rig setup, mud tanks, and power units.

Pipe Storage Yards

Pending successful negotiations, two locations have been identified for potential pipe storage yards and are identified in Figures 2-13 and 2-14. One is a commercial yard (Northern Truck and Crane) located in Arbuckle near the intersection of SR 99 and Eddy Road and the other is north of the City of Woodland near the intersection of Best Ranch Road and CR-100B. The yards were selected based upon their proximity to the Project, major highways, and railroad spurs. Pipe would be delivered by rail to these pipe storage yards in 80-foot joints. The Woodland yard would require grading and fencing prior to use. Soil contamination tests would be performed prior to utilizing the yards to establish a baseline.

The Arbuckle yard would be utilized for the Line 406 segment of the Project and would be used from Spring 2009 to June 2010 (Figure 2-13). The Woodland yard would be utilized for the Line 407 East and West segments of the Project and would be used from January 2010 to June 2013. Total area that would be temporarily impacted by the Woodland yard is 6.36 acres (Figure 2-14).

2.4.2 Aboveground Facilities

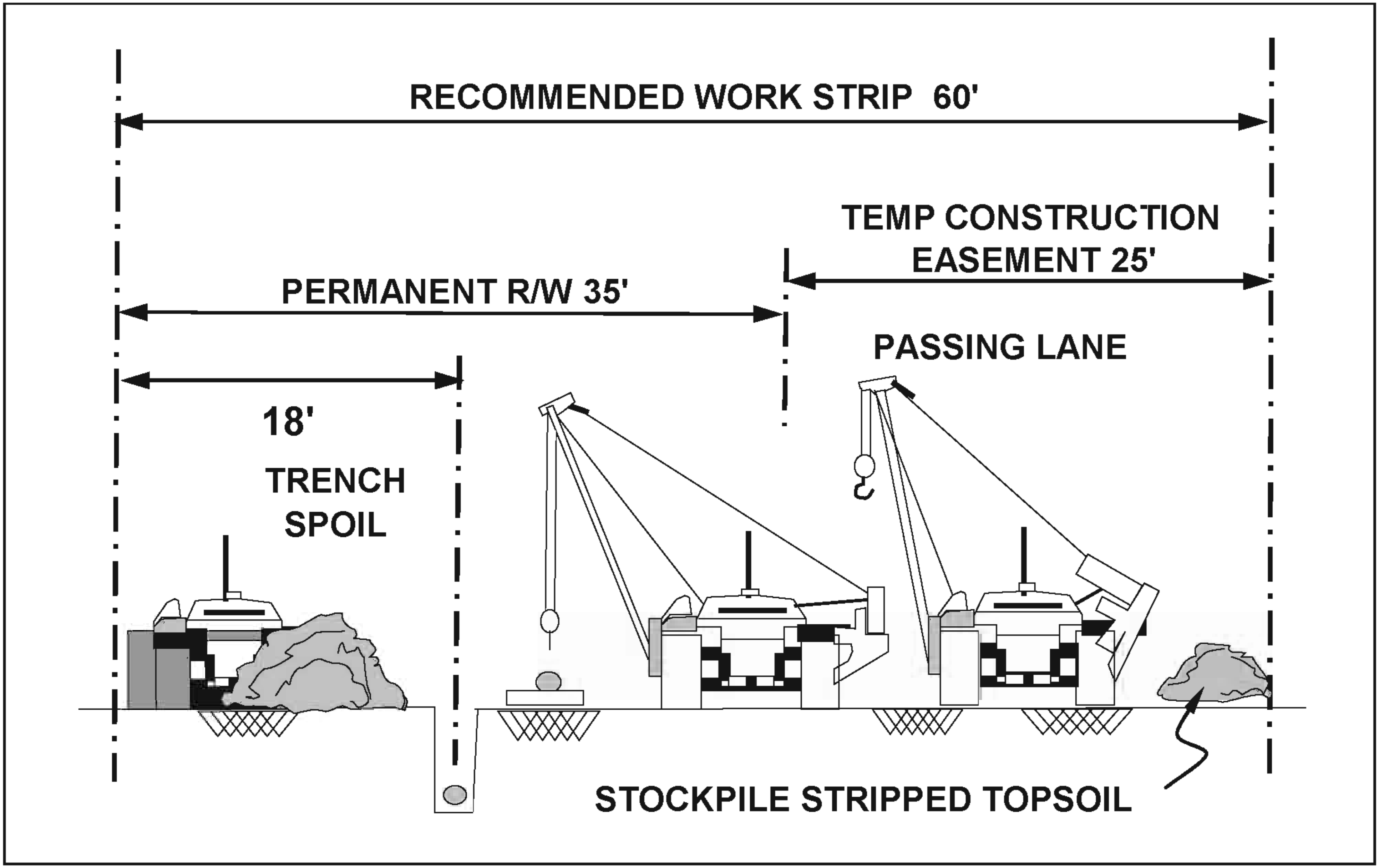
PG&E would be required to obtain additional land rights adjacent to the permanent ROW to accommodate installation of the new PRS, BRS, CMS, YJS, PVS and the passage of internal inspection devices, in compliance with 49 CFR, section 192.150, which requires accommodation of such devices.

Routine maintenance along the majority of the line would consist of quarterly to annual patrolling (e.g., foot or aerial patrol), cathodic protection, and surveys. PG&E would maintain a 50-foot-wide permanent easement along the length of the Project, with the exception of the Powerline Road DFM, which would have a 35-foot-wide permanent easement. Vegetation maintenance would be as needed to maintain a 30-foot-wide corridor centered on the pipe that is free of deep-rooted plants. Because the majority of the route is grassland, row crops, or rice fields, very few areas are expected to require vegetation maintenance by PG&E.

2.5 CONSTRUCTION PROCEDURES

2.5.1 New Pipeline Construction Procedures

Pipeline trenching construction in urban and rural environments generally proceeds as a moving assembly line. Open trenching techniques would be used to construct approximately 91 percent of the proposed pipeline. HDD methods would be used to construct approximately 7 percent of the proposed pipeline to cross large waterways and sensitive resource areas.



Source: CSLC 2007.

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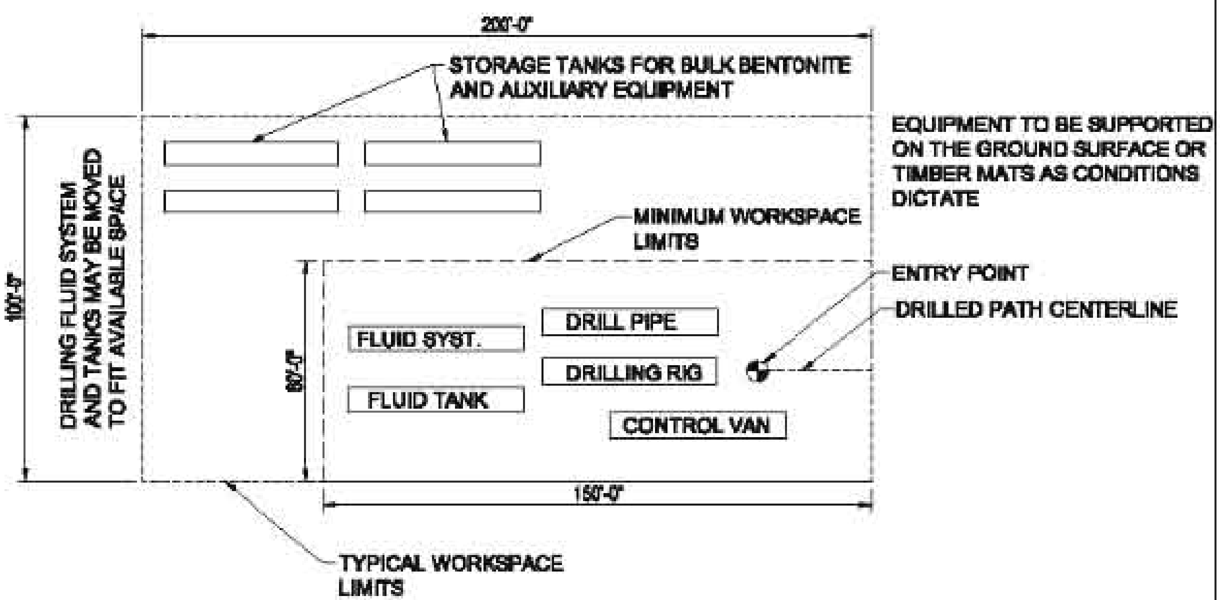
Figure 2-10
60-Foot Construction ROW Configuration

TYPICAL SITE PLAN

HORIZONTAL DIRECTIONAL DRILLING RIG

FRONT VIEW



Note: Typical footprint configuration. Final equipment layout pending detailed engineering.

Source: CSLC 2007.

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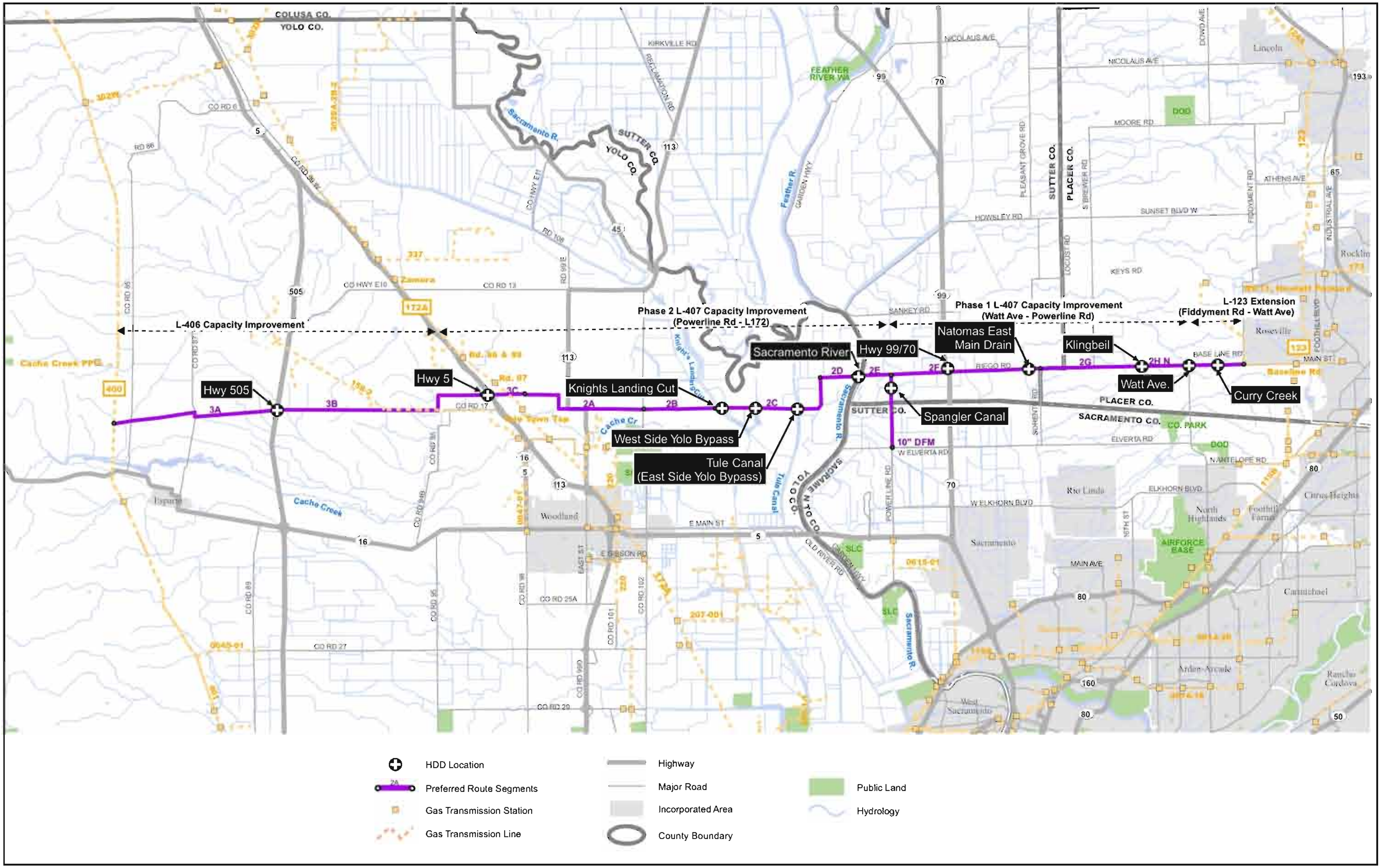
Figure 2-11
Typical HDD Layout



Source: PG&E, March 2009.

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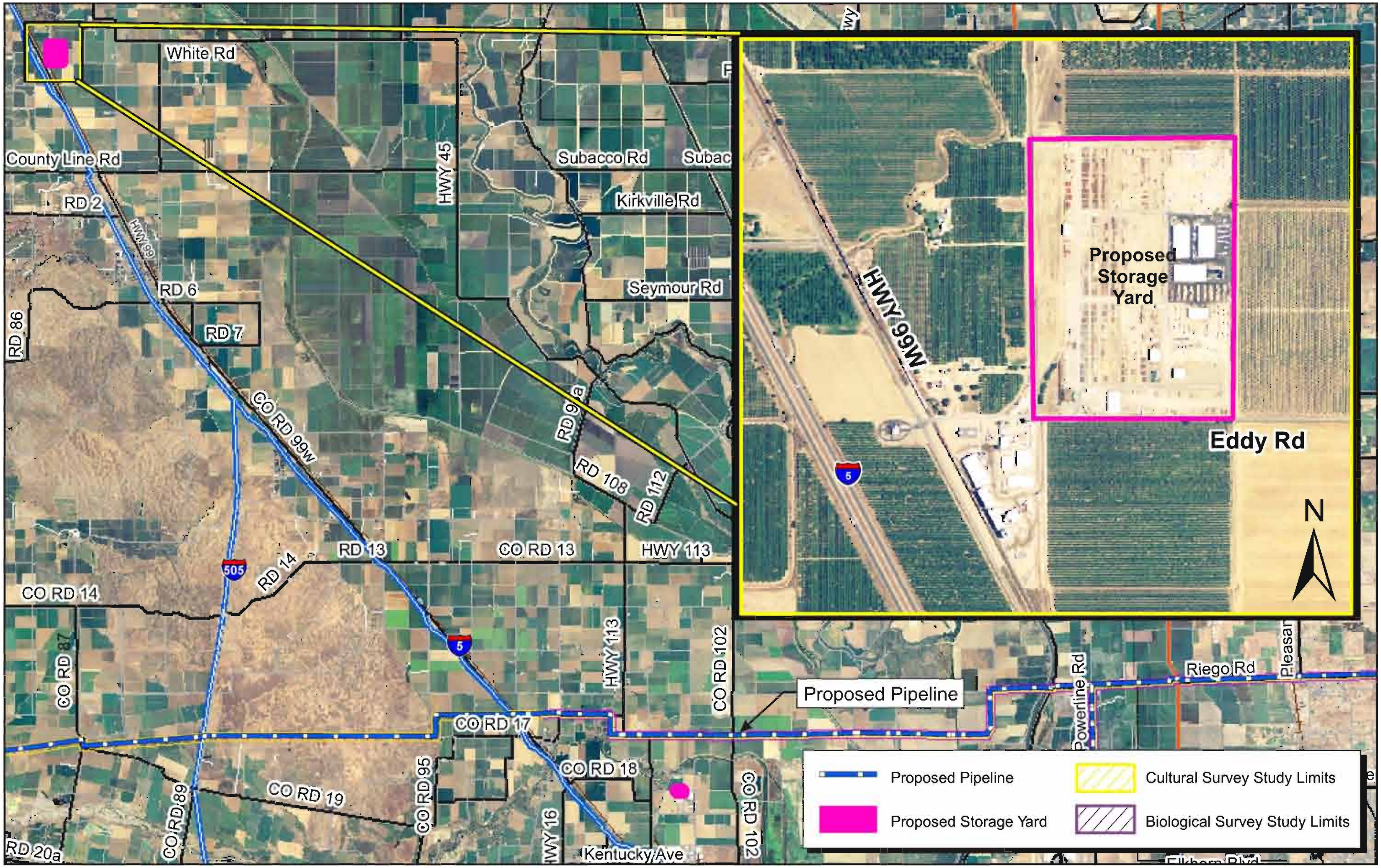
4.5 2.25 0 4.5 Miles

NORTH

Figure 2-12
HDD Sites



Source: PG&E, March 2009.

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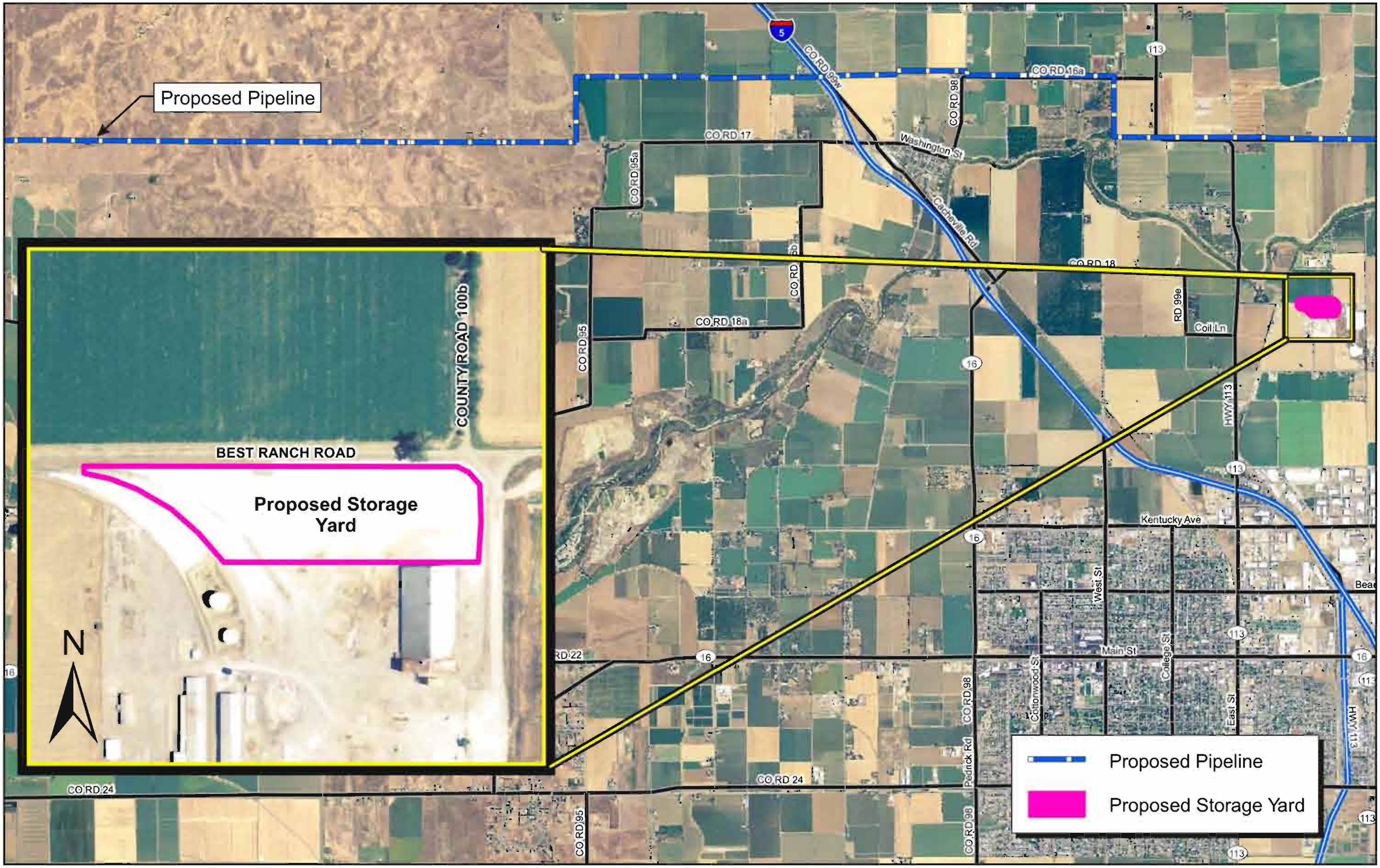
2.5 1.25 0 2.5 Miles

Figure 2-13
Pipe Storage No. 1



Source: PG&E, March 2009.

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1.0 0.5 0 1.0 Miles

Figure 2-14
Pipe Storage No. 2

One of the conventional boring techniques would be used to construct approximately 2 percent of the proposed pipeline to cross roads and small waterways (Table 2-3 below).

Table 2-3: Construction Technique Summary

Construction Type	Approximate Depth (feet below ground surface)[1]
Trench	8
Trench in Roadways	8
Horizontal Directional Drill	35 to 60
Conventional Bore Techniques*	8 to 12

Notes:
[1] Approximate depth is to bottom of construction type feature, not to be confused with depth to cover in Table 2-1.
*These include hammer bore, and auger bore/jack-and-bore
Source: PG&E 2007b.

Before the start of construction, PG&E would complete easement and permit acquisitions and finalize land surveys to locate the centerline of the proposed pipeline and temporary use areas. Also, PG&E would hold a preconstruction meeting between permitting entities and the construction crew. Prior to construction, the entire proposed pipeline ROW would be videotaped to document existing conditions and access roads. To prevent accidental damage during pipeline construction, the 100-foot-wide construction ROW, HDD pull sections, staging areas, construction yard, and other temporary use areas would be surveyed and staked, along with existing utility lines and other sensitive resources identified by Federal and State agencies.

In conjunction with the pipeline installation process, a variety of construction equipment would be utilized depending on the method of installation. Table 2-4 below shows a list of the possible equipment that may be used.

Table 2-4: Construction Equipment

Quantity	Description	Quantity	Description
2	X-Ray Rigs	4	2 Ton Trucks
3	Water Trucks	4	Dump Trucks
2	Low-Bed Transport	2	Graders
6	Side Booms	1	Wheel Trencher

Quantity	Description	Quantity	Description
3	Excavators	3	Front End Loaders
3	Bull Dozers	2	Cranes
2	Drilling Machine	8	Pipe Trucks
14	Welding Trucks	1	Padding Machine
10	Pickup Trucks	1	Mechanic Truck
2	Horizontal Directional Drill Rigs [1]	—	—

Notes:
[1] The HDD process utilizes a large hydraulic-powered HDD rig. The drilling rig is transported by semi-trailer truck. New pipeline segments would also be transported to the Project site on tractor-trailer flatbed trucks. The pipeline segments would be offloaded using a small crane, backhoe, or excavator. Additional HDD support equipment and vehicles include a drilling mud tank, a power unit for the hydraulic pumps, mud pumps, backhoe or excavator, forklift, bulldozer with wide boom, and various utility and crew vehicles.
Source: PG&E 2007b.

Giant Garter Snake Construction Scheduling

Construction in Rice Fields

Pipeline construction is planned through approximately 7 miles of rice fields, which are considered giant garter snake (*Thamnophis gigas*) or (GGS) habitat. Construction in rice fields can pose significant scheduling challenges. The construction window in federally threatened GGS habitat is May 1 through October 1 (refer to Section 4.4, Biological Resources), while rice fields are frequently flooded by May 1 or shortly thereafter and may not be harvested until the end of September. To construct the pipeline in the rice fields during the active farming period, the ROW would need to be isolated from the adjacent fields and not flooded. This would be achieved by constructing temporary earthen berms (rice checks) to segregate the active rice fields from the ROW. While installation of the rice checks would ideally be performed during normal field-preparation activities around late March or early April, this timing is prior to the authorized construction season for GGS. Depending on the weather, harvest timing, and property owner cooperation, construction of the rice checks may be split into two parts to address this scheduling challenge. PG&E would work with the property owners to determine if the berms installed during regular field preparations could accommodate pipeline construction. If this could not be accomplished, PG&E would construct them during the allowable time period between May 1 and October 1, or would consult with the USFWS to acquire permission to construct the berms outside the GGS work window.

Prior Fall ROW Isolation

The ROW may be isolated after harvest the fall prior to construction, but not prior to October 1 in order to comply with the Giant Garter Snake construction window, to resolve the scheduling challenge. The edge of the pipeline ROW through rice fields would be adjacent to field edges or canals. The rice checks may be constructed by pushing up soil from adjacent areas, as is traditionally done, or by using the topsoil removed from the trench to form them. Where irrigation flows must be maintained across the ROW, rigid culverts may be installed across the full width of the ROW as part of the pre-construction work. Sand bags would be used to seal around the ends of the culvert, thereby isolating the flowing water from the work area while the crossing is trenched.

By having the ROW isolated the prior fall, pipeline construction can begin on May 1 (or as soon as the field is sufficiently dry) without interfering with the rice field preparation, planting, and flooding schedule.

Spring ROW Isolation

Should ROW isolation the fall prior to construction not be feasible, PG&E would work with the farmers to install the rice checks during their normal field preparation in the spring. Otherwise, PG&E may request that farmers delay field flooding until the rice checks are installed, or PG&E may request special authorization from the U.S. Fish and Wildlife Service (USFWS) for installation prior to May 1.

Temporary rice checks and rigid culverts installed to segregate the ROW from flooded rice fields would be removed after the fields have been drained in late August or September following construction.

Clearing and Grading

Where necessary, the construction work area would be cleared and graded to provide a relatively level surface for trench-excavating equipment and a sufficiently wide workspace for the passage of heavy construction equipment. Removal of trees in the Project area would be avoided where feasible, but some tree removal may be necessary. As discussed in Section 4.4, Biological Resources, mitigation for tree removal would be provided.

All survey monuments, including United States Geological Survey (USGS) monuments, would be identified and protected during construction activities. If monuments are accidentally damaged or disturbed, PG&E would report the incident to the appropriate agency and would be responsible for the restoration of the monument at its original surveyed location.

Where necessary, erosion controls would be installed immediately following initial disturbance of the soils and maintained throughout construction to contain excavated material within the approved temporary use areas. Erosion controls would consist of methods described in PG&E's Water Quality Construction Best Management Practices Manual (PG&E 2006), as follows:

- Preserve existing vegetation whenever possible;
- If necessary, contact the Project Environmental Representative for clarification regarding areas to be preserved;
- Whenever possible, minimize disturbed areas by locating temporary roadways to avoid stands of trees and shrubs, and follow existing contours to reduce cutting and filling;
- Locate construction materials, equipment storage, and parking areas outside the drip line of any tree to be retained;
- Consider the impact of grade changes to existing vegetation and the root zone;
- Use one or more of the below temporary soil stabilization practices, when applicable - hydraulic mulch, hydro seeding, soil binders, straw mulch, geotextiles, and/or plastic covers and erosion control blankets/mats;
- Implement before the onset of precipitation;
- Implement BMPs such as fiber rolls or gravel bag berms to break up the slope lengths as follows:
    - On steep slopes, place BMPs on slopes 100 feet and greater at intervals no greater than 50 feet;
    - On very steep slopes, place BMPs on slopes 50 feet and greater at intervals no greater than 25 feet;
- Apply permanent erosion control to areas deemed substantially complete during the Project's defined seeding window;
- Refer to individual Soil Stabilization BMPs for specific instructions for use;

- Apply water for dust control evenly and in a manner that does not generate runoff;
- Non-potable water shall not be conveyed in tanks or drainpipes that will be used to convey potable water, and there should be no connection between potable and non-potable supplies. Non-potable tanks, pipes, and other conveyances should be marked "NON-POTABLE WATER - DO NOT DRINK";
- If reclaimed wastewater is used for dust control, the sources and discharge must meet California Department of Health Services water reclamation criteria and the Regional Water Quality Control Board (RWQCB) requirements; and
- Remove any markings, barriers, or fencing after Project is completed.

Before grading would begin, negotiations would be made with the respective property owners and tenants to avoid conflicts with normal land use and operation.

Topsoil Removal

PG&E would remove, stockpile, and replace topsoil during construction activities in accordance with landowner negotiations. All trenches would be backfilled using select excavated subsoils that meet PG&E's backfilling requirements, and topsoil would then be replaced and restored to its original condition using either tracked construction equipment or water to minimize future settling.

Trenching

Trenches would be excavated to a depth sufficient to: (1) provide minimum cover required by DOT specifications (PG&E has proposed a minimum of 5 feet of cover [refer to Table 2-2]); (2) install the proposed pipeline in such a manner to accommodate current agricultural practices; and (3) meet code requirements for proposed activities in roadways. The trench would be approximately 8 to 9 feet deep and typically 4 feet wide in order to allow for approximately 5 feet of cover in agricultural lands (exceeding the DOT standard of up to three feet of cover). The proposed Project would meet Sacramento County Code, Chapter 12.08, Construction in Streets, for activities in roadways. The width of the trench would generally be 3.5 to 5 feet, with wider areas where necessary to accommodate construction personnel to work in the trench.

Construction spoils or excavated overburden would be placed on the opposite side of the trench from construction traffic. To the extent practical, spoil materials would be placed in close proximity to active construction areas to enable efficient space for backfilling. The Project would create a net surplus of construction spoils and, therefore, stockpiling would be necessary.

Numerous roads, driveways, and water features would be crossed during trenching. Table 2-5 identifies major crossings that would be trenched in addition to HDD and bore crossings. Access to all roadways and driveways would be generally maintained with any disruption lasting for no more than four hours, with the exception of HDD crossings, which typically have 24-hour operations. PG&E's contractors would repair any damage to the roadway surface or underground facilities, including irrigation and drainage systems, immediately after construction is completed. Trenches typically would not remain open for more than 5 days in any one area, and there would be approximately 21 days between initial grading and backfilling. Open trenches would be either fenced or otherwise delineated for safety during non-working hours.

For crossings, where it is feasible and where all required permits have been obtained, PG&E plans to open cut features such as county roads and smaller irrigation ditches and canals. When water is flowing, water features that are open cut would likely require a dam-and-pump-around setup where the workspace to be trenched is kept dry during construction and water is pumped around the workspace to continue to flow downstream. Open-cut crossings would be trenched, the pipe installed, and the trench backfilled in one day where possible. If open-cut construction of a county road cannot be completed in one day, the trench would be covered with a plate during non-working hours until construction is complete.

Horizontal Directional Drilling (HDD)

The proposed pipeline would cross the Sacramento River, Knights Landing Ridge Cut, I-5, I-505, and other sensitive areas using the HDD construction technique, totaling approximately 17,506 feet in length (Table 2-3 and Table 2-5). This technique uses a hydraulically-powered horizontal drilling rig supported by a drilling mud tank and a power unit for the hydraulic pumps and mud pumps. The variable-angle drilling unit would be adjusted to the proper design angle for the proposed Project (8 to 10 degrees). The first and smallest of the cutting heads would begin the pilot bore at the surveyed entry point in a small pit on the ground surface. The first section of drill stem would have an articulating joint near the drill cutting head that would be controlled by the bore operator.

Successive drill site sections would be added as the drill head would make its way under the crossing. The drill head would be articulated slightly by the operator to follow a designed path under the sensitive feature and climb upward toward the exit point.

Once the pilot hole is completed, a succession of larger cutting heads and reamers are pulled and pushed through the borehole until it is the appropriate size for the proposed pipeline. While drilling, drilling mud would be pumped under high pressure through the drill stem to rotate the cutting head and return the soil cuttings to the small pit at the surface entry point. The mud would be pumped from this pit to a processing unit where the soil cuttings would be removed and the mud reused for drilling. As part of the bore design process, geotechnical surveys of the subsurface conditions were conducted to determine the underlying geologic strata along the drill path. Infrequently, the geologic strata above the drill may be weaker than anticipated and/or unconsolidated and the high pressure of the drilling mud may result in a fracture of these strata, allowing drilling mud to rise to the ground surface. The drilling operation would be stopped immediately if this occurs. This situation is termed an “inadvertent release” or “frac out” and is usually resolved by reducing the mud system pressure or increasing the mud viscosity. Mud clean-up activities for inadvertent releases are described in Construction Contingency Planning.

While drilling, pipe sections to be pulled through the crossing would be strung on pipe supports in the proposed temporary use areas. The pipe sections would be welded together, x-rayed, and a protective epoxy applied to the joints. A hydrostatic pre-test of the pipe sections would then be performed to ensure integrity prior to pulling. After the drill hole is the correct diameter, a pulling head would be welded on the end of this pipeline section, and the pipe would be pulled through the hole until it surfaces on the other side. Bulldozers with side booms and slings or roller cradles would support the pipe as it would slowly be pulled through the drill hole. The completed drilled crossing would then be connected to the existing pipeline and the entry and exit points would be backfilled and restored as described in Post Construction Activities below.

The Project pipeline would be installed a minimum of 60 feet underneath the bed and banks of any navigable water body and a minimum of 35 feet below any other feature to be crossed by HDD technology. Proposed HDD activities under the Sacramento River are anticipated to be completed during the work window for aquatic species of June 1 through November 30, to avoid impacts to special status fish species.

Each of the 12 HDD bores for Lines 406 and 407 and for the DFM would take approximately two to four weeks to complete. If evening construction would be required during HDD operations, a light plant would be stationed at the entry and exit points. Each light plant would consist of four 1,000-watt fixtures and would be operated by a diesel generator.

Table 2-5: Pipeline Crossings Summary

Feature Name[1]	Project Segment/ Crossing #	Approximate Crossing Width (feet)	Type of Crossing[2]	Feature Acreage
Hungry Hollow Canal	Line 406/#1	124	TR or J/B	n/a
County Road (CR) 85	Line 406/#2	158	TR or J/B	n/a
CR-87	Line 406/#3	150	TR or J/B	n/a
CR-88A	Line 406/#4	59	TR or J/B	n/a
Drainage Canal (406 #1)	Line 406/#5	125	TR	n/a
I-505/CR-90A/Goodnow Slough	Line 406/#6	1,210	HDD	n/a
Yolo County Flood Control - Irrigation Canal	Line 406/#7	94	TR or J/B	n/a
CR-17	Line 406/#8	102	TR or J/B	n/a
CR-96/Acacia Canal	Line 406/#9	98	TR or J/B	n/a
CR-97 F/I-5/CR-99W	Line 406/#10	1,440	HDD	n/a
CR-98	Line 407 West/#1	51	TR or J/B	n/a
CR-16A	Line 407 West/#2	110	TR or J/B	n/a
CR-16A	Line 407 West/#2	100	TR or J/B	n/a
State Route (SR) 113	Line 407 West/#3	262	J/B	n/a
CR-100	Line 407 West/#4	123	TR or J/B	n/a
Dense Trees	Line 407 West/#4	423	TR or J/B	n/a
CR-101	Line 407 West/#5	136	TR or J/B	n/a
CR-102	Line 407 West/#6	151	J/B	n/a

Feature Name[1]	Project Segment/ Crossing #	Approximate Crossing Width (feet)	Type of Crossing[2]	Feature Acreage
CR-17	Line 407 West/#7	120	TR or J/B	n/a
Knights Landing Ridge Cut	Line 407 West/#8	2,400	HDD	n/a
West Yolo Bypass/Drainage	Line 407 West/#9	1,218	HDD	n/a
East Yolo Bypass/Tule Canal	Line 407 West/#10	1,200	HDD	n/a
Drainage Canal (CR-16) #1	Line 407 West/#11	189	TR	n/a
Drainage Canal (CR-16) #2	Line 407 West/#12	184	TR	n/a
Drainage Canal (CR-16) #3	Line 407 West/#13	139	TR	n/a
Sacramento River	Line 407 West/#14	2,162	HDD	n/a
Riego Road	Line 407 West/#14	119	TR or J/B	n/a
Drainage Canal (Riego #1)	Line 407 West/#15	171	TR	n/a
Powerline Road/Irrigation Canal	Line 407 West/#16	n/a	TR	n/a
Riego Road	Powerline Road Distribution Feeder Main (DFM)/#1	148	TR or J/B	n/a
North Drainage Canal	Powerline Road DFM/#2	547	HDD	n/a
Irrigation Canal (Powerline #1)	Powerline Road DFM/#3	172	TR or J/B	n/a
Drainage Canal (Powerline #2)	Powerline Road DFM/#4	206	TR or J/B	n/a
Irrigation Canal (Powerline #3)	Powerline Road DFM/#5	184	TR or J/B	n/a
West Elverta Road	Powerline Road DFM/#6	n/a	TR	n/a
Irrigation Canal (Riego #2)	Line 407 East/#1	130	TR or J/B	n/a

Feature Name[1]	Project Segment/ Crossing #	Approximate Crossing Width (feet)	Type of Crossing[2]	Feature Acreage
North Drainage Canal (Riego #3)	Line 407 East/#2	191	TR or J/B	n/a
Irrigation Canal (Riego #4)	Line 407 East/#3	168	TR or J/B	n/a
SR 70/99/Irrigation Canals (Riego #5)	Line 407 East/#4	1,140	HDD	n/a
Irrigation Canal (Riego #6)	Line 407 East/#5	136	J/B	n/a
Pacific Avenue	Line 407 East/#6	100	TR	n/a
Drainage Canal (Riego #7)	Line 407 East/#7	120	TR	n/a
Drainage Canal (Riego #8)	Line 407 East/#8	85	TR	n/a
Seasonal Wetlands	Line 407 East/#9	n/a	TR	n/a
East Levee Road, Steelhead Creek #1, Western Pacific Railroad	Line 407 East/#9	1,208	HDD	n/a
Pleasant Grove Road	Line 407 East/#10	100	TR	n/a
Riego Road Private Residence #1	Line 407 East/#11	296	TR or J/B	n/a
Vernal Pool/Vernal Swale #1	Line 407 East/#11	150	TR or J/B	0.03
Locust Road	Line 407 East/#12	60	TR	n/a
Seasonal Wetland #1	Line 407 East/#13	n/a	TR	0.05
Seasonal Wetland #2	Line 407 East/#14	n/a	TR	0.05
Seasonal Wetland #3	Line 407 East/#15	n/a	TR	0.09
Seasonal Wetland #4	Line 407 East	n/a	TR	n/a
Brewer Road/Vernal Pool	Line 407 East/#17	123	TR or J/B	0.04
Seasonal Swale #1	Line 407 East/#17	n/a	TR	0.16

Feature Name[1]	Project Segment/ Crossing #	Approximate Crossing Width (feet)	Type of Crossing[2]	Feature Acreage
Riego Road Private Residence #2	Line 407 East/#18	150	TR or J/B	n/a
Seasonal Wetland #5	Line 407 East	225	TR or J/B	n/a
Riparian Wetland	Line 407 East/#19	n/a	TR	n/a
Seasonal Wetland #6	Line 407 East/#20	n/a	TR	n/a
Vernal Pool/ Vernal Swale #2	Line 407 East/#21	2,264	HDD	0.47
Seasonal Wetland #7	Line 407 East/#20	n/a	TR	0.12
Seasonal Wetland #8/ Seasonal Swale #2	Line 407 East/#22	n/a	TR	n/a
Curry Creek #1/Vernal Pool/Vernal Swale #3	Line 407 East/#24	1,872	HDD	n/a
Curry Creek #2/ Vernal Pool Complex	Line 407 East/#25	1,900	HDD	n/a
Seasonal Swale #2	Line 407 East/#26	n/a	TR	0.1
Seasonal Wetland #9	Line 407 East/#27	n/a	TR	1.07

Notes:
[1] Final routing decisions may alter some of these crossings.
[2] (TR) Trenching, (HDD) Horizontal Directional Drill, (J/B) Jack and Bore, (n/a) Not Applicable or Not Available.
Source: Adopted from PG&E 2007a (updated from information provided by PG&E 2008).

In addition to the HDDs, there would be approximately 30 conventional bores, totaling approximately 6,245 feet. Two methods of conventional boring may be employed depending upon contractor preference and soil conditions.

Hammer Boring

For the proposed Project, pneumatic pipe ramming, also known as hammer boring, has been selected as the method that would be used for the bore installation. Pipe ramming is a non-steerable system that drives an open-ended pipe using a percussive hammer, resulting in the displacement of soil limited to the wall thickness of the pipe. For this construction method, pits would be dug on either side of the surface feature to be avoided. The pits would be approximately 15 to 40 feet wide and 50 feet long. The width and depth would depend on the feature to be avoided. The boring equipment and pipe would be lowered into the pit and aligned at the appropriate depth and angle to achieve the desired exit location. A compressor would supply air to the pneumatic ramming tool to thrust the pipe forward. A cutting shoe may be welded to the front of the lead pipe to help reduce friction and cut through the soil.

Several options are available for ramming various lengths of pipe. An entire length of pipe could be installed at once or, for longer distances, one section at a time could be installed. In the latter case, the ramming tool would be removed after each section is in place and a new section would be welded on to the end of the newly installed section. The pneumatic ramming machine would be connected to the new section and ramming would continue. In certain installations, a winch could be connected to the lead end of the pipe to assist in pulling it out. This would require installation of a connection via a pilot hole.

Depending on the size of the installation, spoil from inside the pipe would be removed with compressed air, water, a pig system, or a combination of techniques. A seal cap would be installed on the starter pit side of the installation and spoil would be discharged into the receiver pit.

Auger Boring/Jack-and Boring

Auger boring also referred to as jack-and-bore consists of a rotating cutting head and auger, internal to a steel sacrificial casing that is being advanced hydraulically. The internal auger turns to remove soils while the hydraulics advance the casing. As with Hammer boring, entrance and exit pits are typically excavated in order to accommodate the auger bore equipment. The pits would be approximately 15 to 40 feet wide and 50 feet long. The width and depth would depend on the feature to be avoided. The boring equipment and pipe would be lowered into the pit and aligned at the appropriate depth and angle to achieve the desired exit location. Hydraulic ram(s) thrust the pipe forward while the rotating cutting head and internal auger remove the soil and deposit it in the entrance pit. The excavated spoil would be removed with excavators. Once the crossing is complete, the product pipe is welded to the sacrificial casing. The product pipe and casing are then forced through the soil opening into the exit pit where the casing is cut off in sections. This process continues until all casing pipe has been removed and the product pipe completes the entire crossing.

Epoxy Coating

The pipe would be externally coated for protection at the mill with 16 mils (1 mil = 1/1000 inch) of fusion-bonded epoxy (FBE) before being shipped to either of the two pipe storage areas in 80-foot lengths. In addition, the pipe used for boring would be coated with 40 mils of Powercrete abrasion resistant overcoating (ARO) or equivalent. The weld-joint ARO on HDD-installed pipe would be installed at the temporary use areas. All FBE coatings and application requirements shall be subject to the requirements of CGT Standard EG 4116, latest revision.

Best management practices (BMPs) as outlined in PG&E's Water Quality Construction Best Management Practices Manual would be employed to ensure that these activities would not impact hydrology or other resources based on the use of hazardous materials. These activities would be managed on site as follows:

- The amount of hazardous materials stored at the construction site, and the production and generation of hazardous waste at the construction site, would be minimized;
- Any hazardous materials and wastes would be covered or containerized and protected from vandalism;
- All hazardous materials and wastes would be clearly marked. Hazardous waste containers would be placed in secondary containment systems if stored at the construction site;
- All stockpiled cold mix, an asphalt mixture used exclusively for temporary paving needs, would be placed on plastic and covered with plastic;
- Waste materials would not be intermixed, because this would complicate or inhibit disposal and recycling options and could result in dangerous chemical reactions;
- Storm water that collects within secondary containment structures would be inspected before discharge to ensure that no pollutants are present. Contaminated storm water would be managed according to PG&E's Environmental Practices (EPs), including Vault Dewatering and Spill Prevention, Containment, and Countermeasure (SPCC) pond drainage (these documents are available from PG&E upon request);
- Spills from a secondary containment system would not be discharged; and

- Hazardous waste would be segregated from other solid waste and disposed of properly.

In addition to following this best management practice, employees or contractors would be responsible for compliance with Federal, State, and local laws regarding storage, handling, transportation, and disposal of hazardous waste.

Should a spill occur on the construction ROW or at the storage/staging sites, the following would be implemented:

- The spillage of material would be stopped if it could be done safely;
- The contaminated area would be cleaned, and contaminated materials would be properly disposed;
- The Project foreman and/or the Environmental Representative would be notified;
- To the extent that it would not compromise clean up activities, spills would be covered and protected from storm water run-off during rainfall;
- Spills would not be buried or diluted with wash water;
- Used cleanup materials, contaminated materials, and recovered spill material would be stored and disposed of in accordance with Federal, State, and local regulations;
- Absorbent materials would be used to clean up spills. Spills would not be hosed down with water;
- All water used for cleaning and decontamination of a spill would be collected and disposed appropriately and would not be washed into storm drain inlets or watercourses. Disposal of these wastes would be coordinated with the Environmental Representative; and
- Spill cleanup kits would be kept in areas where any materials would be used and stored.

In the event of a spill, agency representatives or individuals designated by the following agencies would be contacted as necessary. Contact numbers for each agency would be included in PG&E's response plan:

- California State Lands Commission - 24 Hour Emergency Response;

- NOAA Fisheries, Sacramento Office;
- California Department of Fish and Game;
- Central Valley Regional Water Quality Control Board (CVRWQCB);
- U.S. Army Corps of Engineers (USACE); and
- U.S. Fish and Wildlife Service (USFWS).

Other agencies that could be contacted include the Office of Emergency Services, the National Response Center, the U.S. Environmental Protection Agency, and the California Highway Patrol.

Pipe Delivery, Stringing, and Welding

The pipe would be delivered either from the construction yard, or from an off-site coating facility, to the proposed pipeline ROW. The main travel routes that would be used for construction access along Line 406 would include CR-85, CR-87, CR-88A, CR-17, CR-19, and some smaller roads on the east side of I-5. Travel routes to be used for construction access along Line 407 would include CR-16, CR-16A, CR-17, Baseline Road, Riego Road, and Powerline Road. Streets and roads perpendicular to the main routes that may also be used to access the Project area include Watt Avenue, West Elverta Road, Walerga Road, SR 70/99, and SR 113. During construction, the transporting of the required amount of pipe and associated construction equipment could result in a temporary increase of up to 40 round trucks trips a day on these respective roadways. Figure 2-15 illustrates the proposed pipe haul routes.

Access to the Yolo Bypass may be available from CR-16 adjacent to Gray's Bend and the western Yolo Bypass levee road. The primary access for equipment would be along the PG&E's ROW or via temporary bridges across canals or other water features. No new roads are expected to be required for the Project.

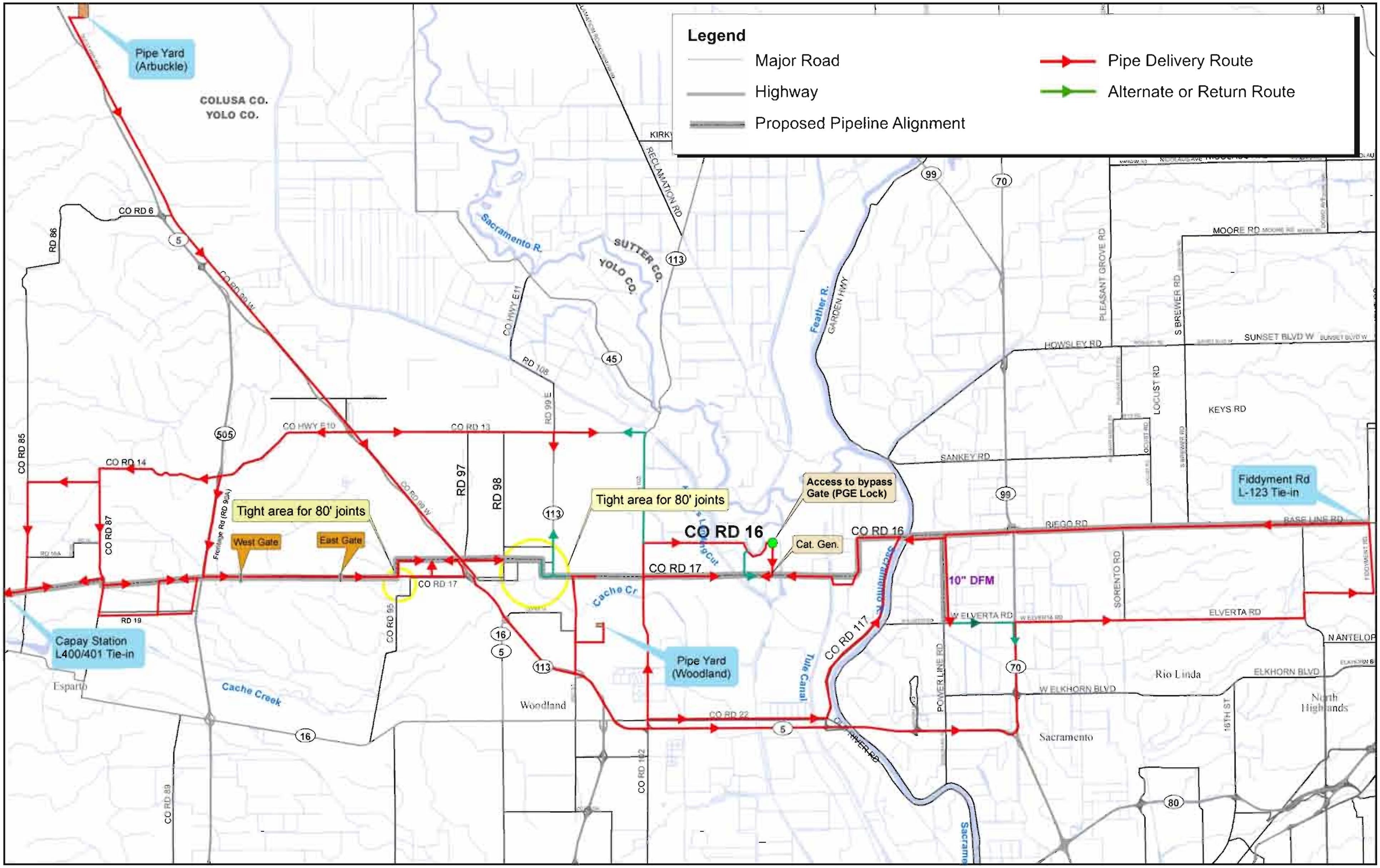
Once in the temporary use areas, individual pipe sections would be aligned and welded together into long strings. All pipeline sections would be "butt-welded," that is, welded together without the ends overlapping. All welds would be x-rayed to ensure structural integrity and compliance with applicable DOT regulations. Welds that do not meet American Petroleum Institute 1104 specifications would be repaired or removed. Once the welds are approved, the welded joints would be covered with a protective coating and the entire pipeline would be electronically and visually inspected for any faults, scratches, or other damage. Any pipe damage would be repaired before being lowered into the trench.

Lowering-In, Tie-In, and Backfilling

The pipeline would be lowered into the trench with two or more sideboom tractors, spaced so that the unsupported pipe between them and between the pipe and ground surface would not overstress the pipe and cause buckling. Tie-in welds, made in the trench at the final pipeline elevation, would be used: (1) where the line would be obstructed by utilities crossing the trench; (2) at the ends of HDD and other conventional bores; and (3) at the ends of lowered strings. The welds would be checked with x-ray and the entire pipeline would then be checked by caliper for geometrical integrity prior to final tie-in where necessary. In hilly terrain, trench barriers or breakers would be installed before backfilling at specified intervals to prevent water movement along the pipeline.

Backfilling would typically occur within 72 hours of pipeline installation to minimize potential impacts to wildlife. At the conclusion of each day's trenching activity, the end of the trench would be left ramped at an approximate 2 to 1 slope to allow any wildlife falling into the trench to escape.

The trench would be backfilled using select excavated subsoils that meet PG&E's backfilling requirements, and topsoil would then be replaced and restored to its original condition using either tracked construction equipment or water to minimize future settling. Soil that is not suitable for backfill or spread as topsoil would be removed from the ROW. It is estimated that approximately 1,200 cubic yards of spoil materials would need to be removed from the pipeline route. All excess spoil would be disposed of appropriately with landowner and agency approval. A moderate level of compaction, 85 percent of maximum density using the American Society for Testing and Materials (ASTM) D-1557 test procedure, would be used to reduce the risk of uplift. Areas that would be under paved surfaces would be compacted to 95 percent or greater as specified by permitting entities. Compacting would be conducted to 85 percent in agricultural areas up to 18 inches from the surface. The entire pipeline ROW would be decompacted/restored per landowner negotiations. Figure 2-16 shows a typical road crossing while Figure 2-17 shows trench backfill operations.

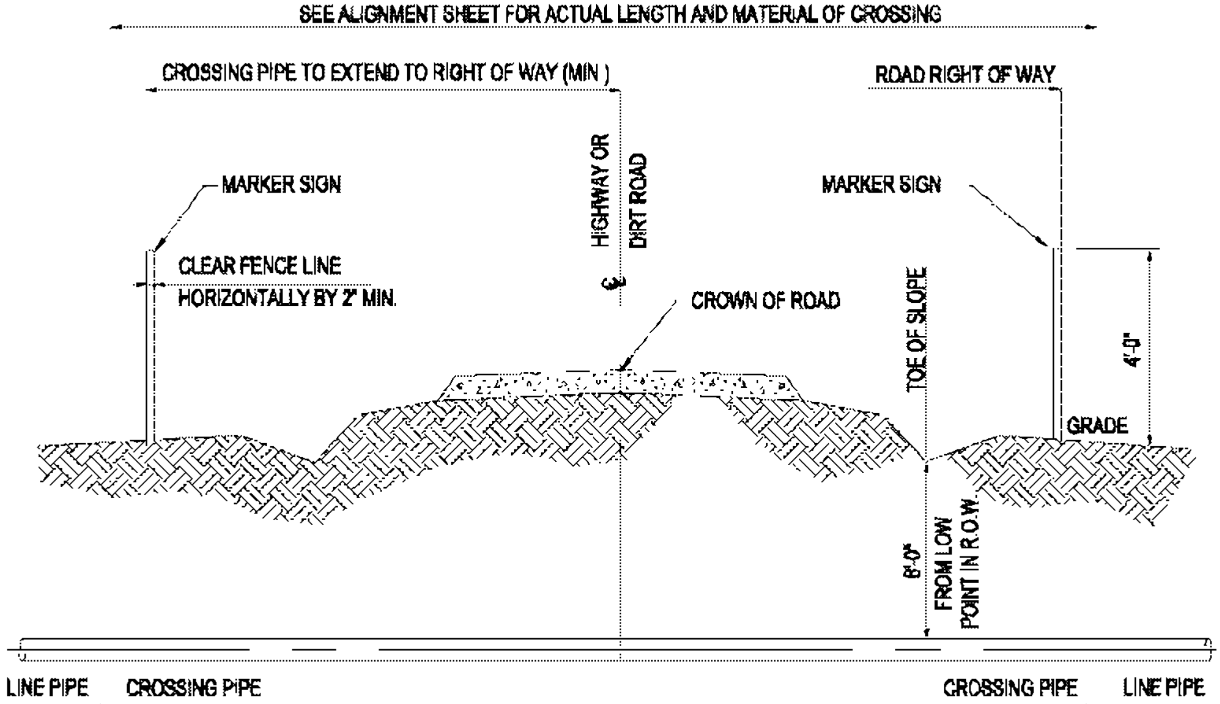


Source: Adapted from PG&E, 2009.

3.8 1.9 0 3.8 Miles

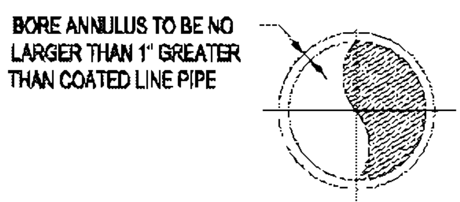
Michael Brandman Associates

Figure 2-15
Proposed Haul Routes



TYPICAL UNCASED ROAD CROSSING

BORED



NOTES:

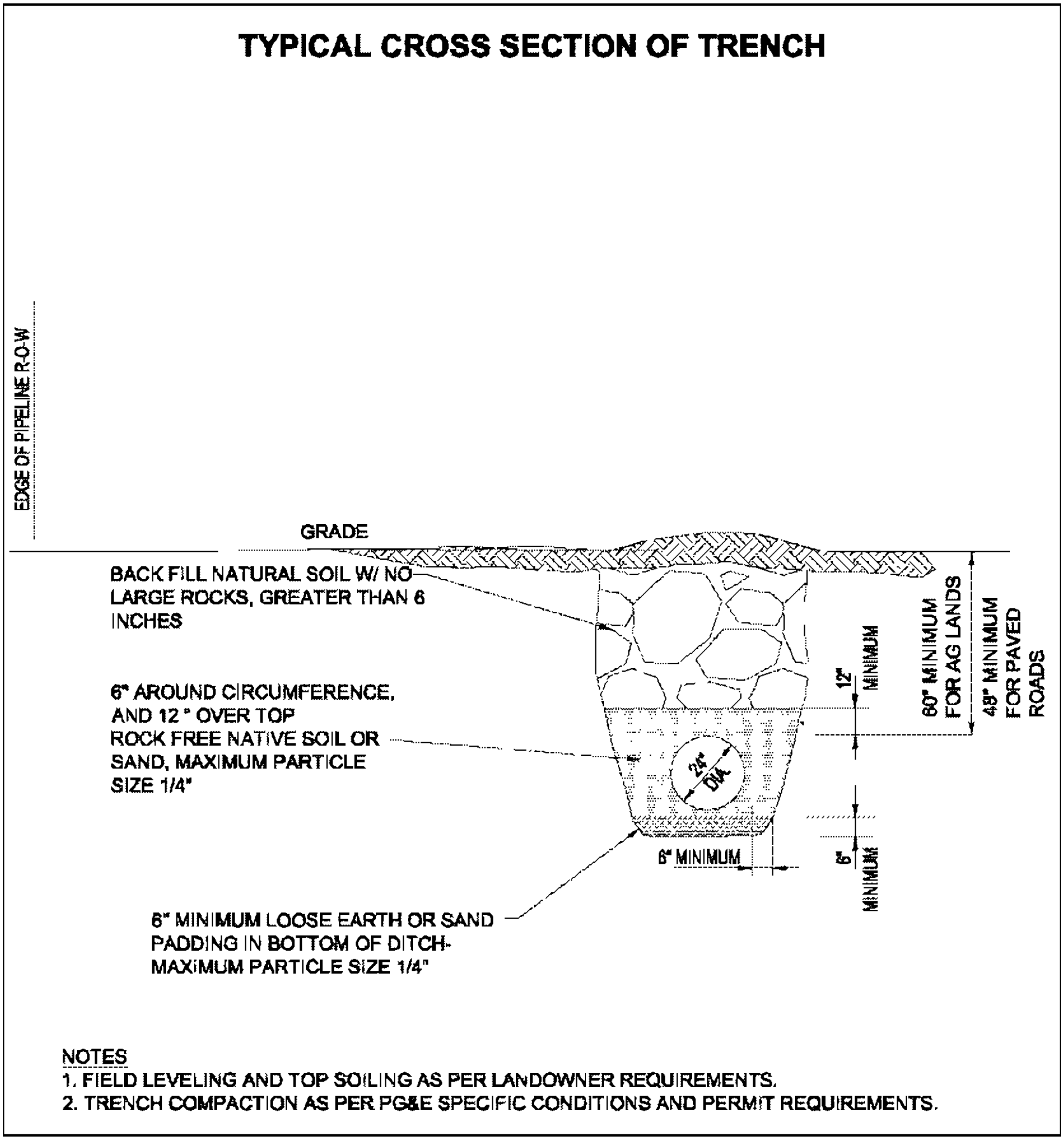
1. CROSSINGS SHALL BE IN ACCORDANCE WITH APPLICABLE PERMIT.
2. ROAD CROSSING PIPE SHALL EXTEND AT MINIMUM TO RIGHT OF WAY LINE.
3. THE TYPE AND MINIMUM REQUIRED LENGTH OF PIPE FOR CROSSINGS OF ROADS SHALL BE AS SPECIFIED ON ALIGNMENT SHEETS.
4. PIPELINE MARKER & TEST STATIONS TO BE INSTALLED ON ROW LINE NEXT TO FENCE IF POSSIBLE.
5. THE CROSSING PIPE SHALL BE STRAIGHT WITH NO VERTICAL OR HORIZONTAL BENDS WITHIN ROAD RIGHT OF WAY.

Source: Adapted from PG&E 2006

Michael Brandman Associates

NOT TO SCALE

Figure 2-16
Road Crossing



Source: Adapted from PG&E 2006

NOT TO SCALE

Michael Brandman Associates

Figure 2-17
Trench Backfill

Pipe Buoyancy

The Project would cross several 100-year special flood hazard areas. For example, western portions of Line 406 within Hungry Hollow (i.e., west of Dunnigan Hills) traverse several 100-year flood hazard areas. In addition, all of Line 407 West within and east of the Yolo Bypass would be within 100-year special flood hazard areas, as well as all of the proposed Powerline Road DFM and the portion of Line 407 East situated west of Sorento Road.

In response to these conditions, PG&E applied criteria specified in DOT 49 CFR section 192.317 to protect the Project from flooding hazards. For portions of the Project within the FEMA-designated 100-year flood zone, PG&E would apply a factor of safety (FS) of 1.5 to decrease the downward force of backfill acting on the pipe. In addition, a relative compaction of 80 percent would be required to ensure the backfill would be stable during the first winter season.

All underwater crossings would be installed via HDD. Soil conditions, pipe geometry, and depth of the HDD crossings are sufficient to prevent buoyancy concerns of the HDD crossings. To address the potential for scour within the Yolo Bypass, a concrete coating would be applied to provide a downward force of 10 lbs/ft or 2-inch minimum thickness whichever is greater (PG&E 2008).

Construction Water Use and Disposal

Water would be required to support Project-related construction for HDD operations, hydrostatic testing, and dust control. Traditional sources would include:

- Public/Private water system (via fire hydrants and irrigation wells);
- Waterways (canals, creeks, or rivers); or
- Water brought in by truck or storage tanks.

The preferred source of water for hydrostatic testing along the route would come from irrigation wells. If irrigation wells could not be secured as a source of water, alternate sources would be used and are identified in Table 2-6. PG&E does not plan to acquire water rights, but would negotiate with landowners for water from agricultural wells, or purchase water from irrigation districts or other commercial water sources.

Final sources would be determined after design drawings are completed and hydrotest procedures are detailed. PG&E would be required to obtain permission from the appropriate agency to obtain the legal right to take water from any water sources.

Table 2-6: Potential Project Water Sources

Line Segment	Description	Location
406 (26+50)	Irrigation Canal	Runs Perpendicular to ROW
DFM (128+00)	Irrigation Canal	N/E corner Elverta/Powerline Roads
407-E (752+00)	Irrigation Canal	N/E corner Elverta/Powerline Roads
407-E (1372+97)	Fire Hydrant	Opposite side of Fiddyment Road
407-W (692+00)	Natural Waterway	Sacramento River
407-W (396+00x)	Natural Waterway	Knights Landing Cut
Source: PG&E 2007b.		

Hydrostatic Testing

The pipeline would be hydrostatically tested at the end of construction phase, and prior to placing into service, per 49 CFR 192.505 and PG&E Gas Standard A37. Each HDD segment would undergo hydrostatic testing to ensure no manufacturing flaw exists prior to pulling the segment into the crossing. Potential water sources are listed in Table 2-6 above. The amount of water required for the tests is listed in Table 2-7.

Table 2-7: Water Usage for Hydrostatic Testing Sources

Line Segment	Approximate Usage
406	2.5 Million Gallons
407 - East	2.1 Million Gallons
407 - West	2.6 Million Gallons
10" DFM	0.06 Million Gallons
Source: PG&E 2007b.	

Hydrostatic test water would be pumped through a filter into the test sections, pressurized to the test pressure, and maintained at that pressure for a minimum of eight hours. The minimum test pressure required is 1.5 times the design pressure

(975 psig) or 1,463 psig, and held for a minimum of 8 hours. The HDD segments would be pre-tested prior to being pulled into the bore to a pressure corresponding to 90 percent SMYS, or 2,708 psig for a duration of 4 hours. Any leaks would be repaired and the section retested until specifications are achieved. Following testing, the water used to test the pipeline and HDDs would be disposed of via the following methods, as described in PG&E's Pre-Construction Review report (PG&E 2007b):

- Discharged into sanitary sewer systems; or
- Discharged into storm drains, drainage ditches, creeks, or rivers (carbon filtering or other form of water conditioning may be required).

The method to be utilized would be determined by the availability and capacity of the systems in the area, requirements of governing agencies, and condition of water after hydrostatic testing. Water quality would be measured from the water source prior to use and after use during discharge to assure that water quality is not compromised as a result of the test. All hydrostatic testing water would be discharged using a flow manifold and energy dissipater to control the rate of discharge and to minimize erosion and turbidity to meet the standards set forth under the terms and conditions of the National Pollutant Discharge Elimination System (NPDES) permit and the General Order for Dewatering and Other Low Threat Discharges to Surface Waters, to be issued by the Central Valley Regional Water Quality Control Board (CVRWQCB).

Based on past experience with similar projects, PG&E anticipates that no contaminants would be introduced to the surface water during the testing process and that all samples would meet standards for gray water and that the water discharged from the hydrostatic test would pose no threat to any plants, fish, or animals.

Pigging Procedure

After the pipelines have been hydrostatically tested and dewatered, the contractor would run several "pigs" of various types (brush, cup, dish, polyethylene, etc.) to remove as much water from the pipeline as possible. Debris in the pipe would be minimal and any remaining residue would be removed from the pipe during the pigging procedure. The contractor would install temporary pig launchers and receivers to expedite this procedure and would monitor the amount of water removed to determine when the line is as dry as possible. Super dry air or other super dry compressed gases (usually nitrogen) would be blown through the pipe to bring the pipeline moisture down to 40 Fahrenheit degrees below the ambient dew point. This would ensure that the line would be dry and that equipment downstream of the new line would not freeze up due to water molecules in vapor condensing when pressures would be significantly reduced at regulating and metering stations throughout the system. The contractor would submit a final hydrostatic testing procedure to PG&E that would include the type of equipment to be used during the pigging and drying procedures.

Lines 406 and 407 would be a continuous 30-inch pipeline separated by a normally open valve at Yolo Junction. When any pigging is done on the pipelines, the pigs would be launched at Capay Station and removed at the Baseline Road Regulating Station. At that regulating station, the pressure would be reduced from 975 psig to 500 psig. A permanent yard would be required to house the equipment and facilitate the required on-going maintenance. The pig receiver would be located at this point to take advantage of the yard. An additional 1,000 feet of pipeline would be required to tie the new Line 407 into PG&E's system at the northwest corner of Baseline and Fiddyment Roads. This major intersection is planned for commercial development and there is no suitable location for a pig receiver. PG&E would monitor this segment of the pipeline per 49 CFR 192 subpart M. Should this area become a HCA in the future, as defined in 49 CFR 192.903, PG&E will assess the integrity of this segment by the use of "direct assessment" techniques as outlined in 49 CFR 192 subpart O.

The 10-inch DFM would include aboveground spools and blind flanges to serve as launchers and receivers. The launcher would be located at Riego and Powerline Roads, and the receiver would be located at Elverta and Powerline Roads.

Blow-Down and Purging Procedure

After hydrostatic testing and drying the pipeline, PG&E would review weather patterns with the local air districts to determine an optimum range of dates for connecting (tying-in) the proposed Project to the existing pipeline network. Data from PG&E’s Department of Meteorological Sciences would be used in coordination with the SMAQMD, YSAQMD, PCAPCD, and FRAQMD to determine dates when air quality constraints would be minimal. Natural gas would be released during the blow-down/tie-in procedure. All local emergency service agencies and schools would be notified of the pending blow-down/tie-in within 72 hours of the proposed activities.

Prior to the day of the tie-in, PG&E would prepare a detailed shut down and tie in procedure. The procedure would be prepared by the Operations Supervisor and reviewed by the PG&E pipeline engineering and gas control departments prior to tie-in. In general, on the day of the tie-in, PG&E's personnel from the Sacramento Division Transmission and Regulation (T&R) Department would reduce the pressure in the existing Line 400/401 pipeline to zero pounds per square inch. PG&E's General Construction Division (GC) would then cut a draft hole in Line 400/401 near the future CMS. Air movers would be installed up and downstream of the CMS to remove the gas from the pipeline and into the atmosphere. When both air mover locations are clear of gas, PG&E would proceed with the tying-in of Line 406.

When all tie-in welds are completed and the x-rays are accepted, the line would be turned over to PG&E's T&R Department for operations. The air movers would be removed and valves would be set up to purge the air from the pipeline. The main line valve at CMS would be opened and fresh air purged through to the YJS. When it is determined that Line 406 is completely filled with natural gas, the blow-off valve would be closed and Line 406 would be brought up to operating line pressure. This same process would be applied to 407-W and 407-E.

2.5.2 Aboveground Facility Construction Procedures

The majority of all station piping would be pre-fabricated at the construction yard and then transported to the station locations for final assembly and tie-in to the pipeline facilities. After installation, the aboveground facilities would be fenced and painted. Figure 2-8 provides an illustration of an existing facility representative of the Project facilities.

2.5.3 Construction Contingency Planning

PG&E has developed a number of contingency plans to be implemented during construction of the proposed Project if certain unexpected events occur.

HDD Abandonment Contingency Planning

If extreme conditions are encountered during horizontal directional drilling operations and retrieval of down-hole tools becomes impossible, the HDD contractor could be forced to abandon a portion of the directional drilled hole or possibly the entire hole. This could occur during any phase of the HDD process and could potentially require the abandonment and grouting of the hole. The HDD contractor would use procedures to substantially reduce the possibility of this occurring. However, the following are potential abandonment scenarios that could take place during different stages of the drilling process.

Abandonment of Pilot Hole/Pilot Hole Continuation

In the event that the HDD contractor becomes unsuccessful in completing the directional drill pilot hole and the hole must be abandoned, the HDD contractor would make every effort to remove as much pipe as possible from the hole and abandon the unusable portion of the hole. Procedures would be invoked for the successful continuation of the drilling, including the following:

- The down-hole assembly would be advanced and the drill stem would be stopped;
- Cement, bentonite, or an industry-approved fill material would be made available at the drill rig location;
- The drill mud rig would be prepared for pumping material down the hole through the drill stem; and
- Cement, bentonite, or industry approved fill material would be pumped down the hole through the drill stem as the drill stem is withdrawn, to displace bentonite (drilling mud) slurry in the hole.

Abandonment During Reaming Operation

In the event that drilling operations are suspended during reaming of the pilot hole, the following procedures would be enacted:

- Advancement of the reamers would be halted;
- Cement, bentonite, or an industry approved fill material would be made available at the drill rig location;
- The drill mud rig would be prepared for pumping material down the hole through the drill stem;
- Cement, bentonite, or industry approved fill material would be pumped down the hole through the drill stem as the drill string is withdrawn, to displace bentonite (drilling mud) slurry in the hole;

  - If the Drilling Superintendent ascertains the need to replace the reamer with a cement head, the reamer would be withdrawn and replaced by a special head built for grouting;

- If the reamer could not be extracted, the drill rig would be moved to the opposite side for removal of the reamer from the hole;

  - A cement head would be sent down the hole on pilot string until the previously cemented reamed hole is pumped; and

  - The drill string would be withdrawn and the hole pumped with cement or industry-approved fill material to displace the bentonite slurry material.

Contingency Plan for Inadvertent Release During HDD

Inadvertent release of drilling fluids is a potential concern when HDD methods are used for construction conduits under sensitive habitats and waterways. While bentonite is a non-toxic substance, its inadvertent release into waterways could adversely impact aquatic species, smothering benthic invertebrates, aquatic plants, and fish or their eggs with the fine bentonite particles.

The drilling contractor would be required to submit a detailed plan for the inadvertent release of drilling fluid. This plan would be made available to the CSLC prior to construction. During drilling, the driller would monitor the fluids. A noticeable lack of returns and a decrease in annular down hole pressures would warrant further investigation such as visual inspection and duration of loss. In the event that drilling fluid would be noticeably lost from the borehole the driller would implement the following procedures:

1. Temporarily cease drilling operations, including pump shut down;

2. Notify the appropriate Federal and State agencies (including the CSLC) as soon as possible by telephone and/or facsimile of the release event, detailing the nature of the release and corrective actions being taken. The notified agencies would determine whether additional measures need to be implemented;

3. Dispatch experienced observers as required to monitor the area in the vicinity of the drilling, for inadvertent returns of drilling fluid at the ground surface and/or water body;

4. Identify the position of the drill head in relation to the point of entry; and
5. Restart the pump and stroke the borehole up and down in stroke lengths up to 30 feet up to six times but no fewer than two times in an effort to size the borehole annulus and reopen the circulation pathway.

In addition, the drilling fluid could be thickened within the guidelines set forth by the manufacturer to aid in reestablishing circulation as required depending on borehole conditions. Observers would continuously monitor for inadvertent fluid returns as long as the pump would remain on. Occasionally, based on the driller's discretion, the stroke length could be increased up to 90 feet or past the point at which drilling fluid circulation was lost.

If circulation is reestablished, drilling would proceed as usual and monitoring for inadvertent fluid returns would take place once again if the rate of drilling returns progressively decreases at the fluid entry pit. If circulation is not reestablished, monitoring for inadvertent fluid returns to the ground surface and/or water body would continue and drilling would proceed.

If the amount of inadvertent returns is not great enough to allow practical collection, the affected area would be diluted with fresh water and allowed to dry and dissipate naturally back into the earth. If the amount of returns exceeds that which could be suitably contained with hand placed containment barriers, small collection sumps with less than 134 cubic feet (3.8 cubic meter) capacities would be used to pump fluid back to the solids control system.

If drilling fluid returns are observed to be continuously surfacing aboveground at an accessible location, the following procedure would be followed:

1. Pumping of the drilling fluid would immediately cease;
2. The location would be contained so that the drilling fluid could not migrate across the ground surface. Materials and equipment that could be used for containment include:
    - Straw bales;
    - Silt fence;
    - Check dams;

- Backhoe for accessible areas;
- Shovels;
- Portable pumps;
- Flashlights and light towers for night operations; and
- Twenty 100-foot sections of hose;

3. A small sump pit would be excavated at the location to provide a means for the fluid to be returned to either the drilling operations or a disposal site (i.e., pump through hose or into tanker);
4. The on-site contractor supervisor and PG&E's representative would be notified;
5. Drilling operations would continue, maintaining the integrity of the containment measures and monitoring the fluid returns as required to ensure that no surface migration occurs; and
6. Cleanup would be carried out once inadvertent returns are contained/controlled, and the following would occur:
    - Fluid would be pumped to a secure containment vessel;
    - Area would be diluted with water; and
    - Area would be restored to original condition;

If inadvertent drilling fluid returns are observed to be surfacing aboveground at a location that is inaccessible, i.e. along the bed of a water body, or into the water, the following procedures would be followed:

1. Follow the above procedures as outlined to the extent they are appropriate given the location of the returns;
2. Ensure that all reasonable measures within the limitations of the technology have been taken to reestablish circulation; and
3. Continue drilling with the minimum amount of drilling fluid required to penetrate the formation and successfully install the product line.

Hazardous Materials Contingency Planning

The only known hazardous materials that would be on site during construction of proposed Project would be fuels and lubricants in the construction equipment as well as pipeline coating materials. These materials would be stored at the pipe storage yards, not on the construction ROW. The potential for a fuel/lubricant spill would be limited to the capacity of the involved equipment.

Hazardous materials would be managed on site in accordance with PG&E's Water Quality Construction Best Management Practices Manual as listed in Section 2.5.1, New Pipeline Construction Procedures, under Epoxy Coating.

2.6 CONSTRUCTION SCHEDULE

Construction of Line 406 would begin in September or October 2009 with the proposed in-service date scheduled for February 2010. The Line 407 East, Line 407 West, and DFM segments would be constructed in two different phases as dictated by the added load on the transmission system. Current projections are that Phase 1, consisting of Line 407 East and the DFM, would be constructed in May 2010 with an in-service date of September 2010. However, PG&E acknowledges that Phase 1 installation may need to occur in advance, as early as 2009, of several road improvement projects associated with developments along Baseline Road and Riego Road. Phase 2, consisting of Line 407 West, is projected to be required in 2012, but may be required earlier depending upon load growth in the area.

Construction would occur between 6:00 a.m. and 6:00 p.m., Monday through Saturday, except for the HDD operations and hydrostatic testing, which may occur around the clock. Construction and installation of the proposed pipeline would require approximately 90 to 130 workers. Seventy-five to 100 workers would typically be non-PG&E contract employees, 5 to 15 would be from PG&E's labor force, and 10 to 15 would be contract inspectors. These workers would be dispersed over the pipeline Project.

2.7 ENVIRONMENTAL COMPLIANCE INSPECTION AND MITIGATION MONITORING

Pipeline construction would be performed in accordance with PG&E's Water Quality Construction Best Management Practices Manual, which is hereby incorporated into the proposed Project description (PG&E 2006). PG&E has also proposed specific Applicant Proposed Measures (APMs) designed to reduce the environmental effects of the proposed Project. The APMs, which are considered by the CSLC to be part of the proposed Project, are identified in the applicable issue area analyses presented in Section 4.0, Environmental Analysis. Several of the Section 4.0 issue area analyses also contain additional mitigation measures (MMs) that the CSLC has determined would be required to reduce potentially significant impacts to less than significant levels.

2.7.1 Measures Designed Into Proposed Project to Avoid Potential Impacts

All of the Project APMs and MMs are presented in each resource section of this Draft EIR and are consolidated in Section 6.0, Mitigation Monitoring, Compliance, and Reporting Program (MMRP). A full-time third-party compliance monitor under contract to the CSLC would be present during construction activities to monitor compliance with Project APMs, MMs, and other requirements. Other Federal and State agencies may also conduct inspections and monitoring to the extent determined necessary by the individual agency.

In addition to the mitigation monitoring conducted by the CSLC, PG&E would hire Environmental Inspectors (EIs) to ensure compliance with all APMs, MMs, and permit requirements. The responsibilities of the EIs include ensuring that the environmental conditions of the EIR and other permits or authorizations are met. Specifically, the EI would be:

- Responsible for monitoring and ensuring implementation and compliance with all APMs and MMs identified in the EIR and construction contracts, as well as for other permits, authorizing documents, and BMPs;
- Empowered to order correction of acts that violate the environmental conditions of the EIR and any other authorizing document;
- Hired as a full-time position separate from all other activity inspectors; and
- Responsible for maintaining status reports.

Post Construction Activities

Once the proposed Project is packed with gas to operating line pressure, the temporary use areas would be restored in accordance with pre-arranged landowner requirements. PG&E’s contractor would obtain landowner verification that all restoration was completed to the satisfaction of the landowner prior to demobilizing from the ROW. Soil would be decompacted and reseeded in accordance with the landowners’ requests. The alignment would be marked with 12-inch by 34-inch white and orange striped signs, placed approximately 8 feet high in accordance with PG&E's standards for gas line marking. The requirements for marking gas facilities are outlined in PG&E's DCS/GTS Standard D-S0402/S4122 as follows:

- All markers shall be permanently identified with the manufacturer's name and the date of fabrication;
- Diagonal stripping shall be applied to both sides by directly screening a compatible coating of international orange #27 to the marker after the white coating is applied;
- A pressure sensitive pipeline warning sign (Gas Standard L-12) shall be installed on each side of marker;
- Where required, pressure sensitive pipeline warning sign decal in Spanish shall be placed as per Gas Standard L-12.2;
- In instances where additional detailed information needs to be shown on the marker installation (such as main location or pipeline number), a metal marker plate shall be used per Gas Standard L-13;
- A pipeline number may, as an alternative, be added directly to the marker support by stenciling or by using pressure sensitive marker numbers; and
- For installations where the ground is sufficiently firm, the rail or pipe post can be set in native soil. For installations in unstable ground, concrete shall be used.

An example of a pipeline marker is shown in Figure 4.1-1 of Section 4.1, Aesthetic/Visual Resources.

All construction material and debris would be removed and disposed of at appropriate landfills. All work areas would be graded and restored to pre-construction contours within 20 days of trench backfilling. Restoration activities would commence within 6 days of final grading.

All temporary access roads would be re-graded and restored in a manner similar to the pipeline ROW, unless the property owner requests the road to remain as is. All paving repairs would be made in accordance with current city and county requirements. Following construction of the proposed pipeline, the entire ROW would be videotaped to document post-construction conditions and access roads. No new access roads would be required for pipeline operation and maintenance.

2.8 OPERATION, MAINTENANCE, AND SAFETY CONTROLS

2.8.1 Public Safety

Existing staff at PG&E's T&R Department would operate and maintain the new pipeline, provide routine maintenance services, and respond to emergencies in accordance with PG&E's Gas System Maintenance and Technical Support Emergency Plan Manual (EMP). The system would be constantly monitored and controlled by a SCADA system that would detect pressure drops in the pipeline indicating a leak or other operating problem. As an additional measure, to prevent third-party damage to the proposed pipeline at a future date, PG&E would take Global Positioning System (GPS) coordinates at the locations of all pipe welds in order to maintain an accurate location of the proposed pipeline once it is in the ground.

The pipeline would be operated and maintained in accordance with all applicable requirements included in the DOT regulations in 49 CFR 192, "Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards." Further, the proposed Project would be subject to CPUC standards as embodied under General Order 112E. In addition, the proposed pipeline would be operated in accordance with PG&E's EMP. The EMP contains procedures, including pre- and post-emergency planning, on-scene response, incident reports, etc., to be followed for prompt effective responses to significant upset conditions detected along the pipeline or reported by the public. Typical testing and inspection procedures that would be conducted by PG&E in compliance with Federal regulations include:

Inspection/Testing	Frequency
Cathodic protection (Pipe to Soil Potential)	Annually
Cathodic protection (Rectifier Readings)	Six times per year
Valve testing	Annually
Pipeline patrols	Annually
Class 1 & 2	Annually
Class 3	Twice per year
Leak Surveys	Annually
High Consequence Area (HCA) Risk assessment	Every seven years
Source: PG&E 2008.	

PG&E has procedures in place for operations, maintenance, and emergencies, as required under DOT regulations under 49 CFR Part 191 (reporting requirements), and 49 CFR Part 192 (transportation of natural gas), that would apply to the proposed pipeline.

2.8.2 Corrosion Protection and Detection Systems

External corrosion control measures for the proposed Project include protective coating on the exterior of the pipe and use of cathodic protection systems. These systems are designed to meet the minimum requirements established by the DOT for protection of metallic facilities from external, internal, and atmospheric corrosion. The location and installation of a rectifier (used for cathodic protection of the pipe) would be determined during final engineering.

2.8.3 High Consequence Area

The Office of Pipeline Safety and the DOT have identified specific locales and areas where inadvertent releases from pipelines could have the most significant adverse consequences. An equation has been developed that estimates the distance from a potential explosion at which death, injury, or significant property damage could occur. This is known as the potential impact radius (PIR) and is used to represent potential impact circles. Operators are required to calculate the potential impact radius for all points along their pipeline in order to identify specific populations and structures within each radius. Depending on the makeup of each impact circle, different classes have been designated to define a High Consequence Area (HCA) as follows: potential impact circles that contain 20 or more structures intended for human occupancy; buildings that house populations with limited mobility; buildings that would be hard to evacuate; or buildings and outside areas where 20 or more people gather at least 50 days in any 12 month period.

Specifically, HCAs include areas where a pipeline is within 300, 660, or 1,000 feet of a building or an outside area where 20 or more persons congregate at least 50 days in any 12-month period. Operators must determine which segments of their pipeline could affect HCAs in the event of a release. This determination is made assuming a release can occur at any point. Operators are also required to devote additional efforts and analysis in HCAs to ensure the integrity of the pipelines. The portions of the Project within Class 3 areas, including Line 407 East and the Powerline Road DFM, would be within an HCA. Certain portions of the Project would be required to be included in PG&E's Pipeline Integrity Management Plan, which provides for the assessment and mitigation of pipeline risks in an effort to reduce both the likelihood and consequences of incidents. The Pipeline Integrity Management Plan includes procedures for conducting operations and maintenance activities and for emergency response, as well as procedures for handling abnormal operations.

2.8.4 Emergency Response

PG&E's Sacramento Division T&R supervisor would implement guidelines and procedures established in PG&E's EMP, in the event of a pipeline-related emergency (e.g. gas leak, earthquake, accidental release of hazardous materials or waste, fire or explosion, and/or pipeline or facility damage). These procedures have been designed in accordance with State and Federal regulations, including 40 CFR Part 265, Health and Safety Code (Chapter 6.95), and titles 19, 22, and 27 of the California Code of Regulations. This document is reviewed annually with local agencies to ensure that it is current and that all personnel understand the plan and their responsibilities.

2.9 FUTURE PLANS AND ABANDONMENT

The expected operational life of the Project is about 50 years and is normally dictated by economic obsolescence. When the proposed Project reaches the end of its useful life, it would be deactivated in accordance with appropriate Federal, State, and local regulations enforced at the time that the pipeline would be taken out of service, including DOT's 49 CFR Part 192.

3.0 ALTERNATIVES AND CUMULATIVE PROJECTS

3.1 FACTORS USED IN SELECTION OF ALTERNATIVES

3.1.1 Alternatives Development and Screening Process

One of the most important aspects of the environmental review process is the identification and assessment of reasonable alternatives that have the potential for avoiding or minimizing the impacts of a proposed Project. In addition to mandating consideration of the No Project Alternative, the CEQA Guidelines (section 15126.6 (c) and (d)) emphasize the selection of a range of reasonable alternatives and an adequate assessment of these alternatives to allow for a comparative analysis for consideration by decision-makers.

The CEQA requires consideration of a range of reasonable alternatives to the Project or Project location that: (1) could feasibly attain most of the basic Project objectives; and (2) would avoid or substantially lessen any of the significant impacts of the proposed Project. An alternative cannot be eliminated simply because it is more costly or if it could impede the attainment of all Project objectives to some degree. However, the CEQA Guidelines declare that an EIR need not consider an alternative whose effects cannot be reasonably ascertained and whose implementation is remote or speculative. The CEQA requires that an EIR include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed Project.

The CEQA Guidelines requires the selection of an environmentally superior alternative. The determination of an environmentally superior alternative is based on the consideration of how the alternative fulfills the Project objectives and how the alternative either reduces significant, unavoidable impacts or substantially reduces the impacts to the surrounding environment. The CEQA Guidelines (section 15126.6(e)(2)) state, in part, that “If the environmentally superior alternative is the “No Project” alternative, the EIR would also identify an environmentally superior alternative among the other alternatives.”

3.1.2 Alternatives Screening Methodology

Alternatives to the proposed Project were selected based on the information received from PG&E, the EIR study team, and the public and local jurisdictions during the EIR scoping period. The alternatives screening process consisted of three steps:

Step 1: Define the alternatives to allow comparative evaluation.

Step 2: Evaluate each alternative in consideration of one of more of the following criteria:

- The extent to which the alternative would accomplish most of the basic goals and objectives of the Project;
- The extent to which the alternative would avoid or lessen one or more of the identified significant environmental effects of the Project;
- The potential feasibility of the alternative, taking into account site suitability, economic viability, availability of infrastructure, General Plan consistency, and consistency with other applicable plans and regulatory limitations; and
- The requirement of the CEQA Guidelines to consider a “no project” alternative and to identify, under specific criteria, an “environmentally superior” alternative in addition to the “no project” alternative (the CEQA Guidelines, section 15126.6(e)).

Step 3: Determine suitability of the proposed alternative for full analysis in the EIR. If the alternative is unsuitable, it is eliminated, with appropriate justification, from further consideration.

Feasible alternatives that did not clearly offer the potential to reduce significant environmental impacts along with infeasible alternatives were removed from further analysis. In the final phase of the screening analysis, the environmental advantages and disadvantages of the remaining alternatives were carefully weighed with respect to potential for overall environmental advantage, technical feasibility, and consistency with Project and public objectives.

If an alternative clearly does not provide any environmental advantages as compared to the proposed Project, it is eliminated from further consideration. At the screening stage, it is not possible to evaluate potential impacts of the alternatives or the proposed Project with absolute certainty. However, it is possible to identify elements of the proposed Project that are likely to be the sources of impact. A preliminary assessment of potential significant effects of the proposed Project resulted in identification of the following impacts:

- Water resources that could be degraded during pipeline construction and tunneling activity or by unexpected fluid leaks on the surface (known as “frac-outs”);
- Agricultural cultivation and long-term soil productivity;
- Biological resources (including listed wildlife and plant species) and sensitive habitats that could be affected by pipeline construction;
- Historical, cultural, and paleontological resources along the proposed route;
- Geologic hazards such as strong seismic ground shaking and unstable soil units, including impacts to levee stability and/or integrity;
- Noise disturbance to nearby residents and also to nesting birds from construction activities;
- Air quality impacts from construction equipment emissions and pipeline blowdown;
- Traffic and transportation impacts, including construction vehicles on local roads and disruption of traffic flows and emergency access during pipeline trenching; and
- Hazards, including risk of serious injuries and fatalities, due to pipeline rupture and explosion or fire from structural failure, corrosion, or inadvertent damage.
- Potential land use conflicts associated with school siting requirements that prohibit school districts from acquiring a school site located within 1,500 feet of an easement for an underground pipeline.

For the proposed Project, the primary technical and regulatory issues that could render an alternative infeasible relate to:

- Disturbance to waterways and wetland resources;
- Overall pipeline length and constructability, including geologic constraints such as fault crossings and/or hillside construction; and
- The likelihood of obtaining right-of-way (ROW) easements on private lands.

3.1.3 Summary of Alternative Screening Results

Potential alternatives were reviewed against the above criteria. A number of alternative routes were eliminated based on the infeasibility of constructing and operating a pipeline along them. Those alternatives that were found to be technically feasible and consistent with PG&E's objectives were reviewed to determine if the alternative had the potential to reduce the environmental impacts of the proposed Project.

Table 3-1 and 3-2 represent the evaluation and selection of potential alternatives to be addressed in the EIR. Table 3-1 provides the alternatives that have been eliminated from further consideration (described below in Section 3.2). Table 3-2 provides the alternatives that are evaluated qualitatively in each resource area in Section 4.0, Environmental Analysis.

Table 3-1: Alternatives Eliminated from Consideration

Alternative	Location Relative to Proposed Project
Line 406 and 407 Northern Alternative	North of Line 406 and 407
Line 407 Southern Alternative	South of Line 407
Line 406 Central Alternative	North of Line 406
Systems Alternatives	NA - systemwide projects

Notes:
NA = not applicable
I = Interstate
CR = County Road
Source: Michael Brandman Associates 2009.

Table 3-2: Alternatives Evaluated in This EIR

Alternative	Location Relative to Proposed Project
No Project Alternative	NA
Option A	North of Line 406
Option B	North of Line 406 until I-505
Option C	North of Line 406 in the Hungry Hollow area
Option D	North of Line 406 between CR-87 and CR-89
Option E	South of Line 406 between CR-87 and CR-89
Option F	West of Line 406 at CR-95

Alternative	Location Relative to Proposed Project
Option G	South of Line 407 between CR-97 and CR-98
Option H	South of Line 407 from the Knights Landing Ridge Cut to Powerline Road
Option I	North of Line 407 directly east of Brewer Road
Option J	North of Line 407 directly east of Brewer Road
Option K	North of Line 407 between Country Acres Lane and Watt Avenue
Option L	Along Line 407 between Country Acres Lane and Watt Avenue
Source: Michael Brandman Associates 2009.	

3.2 ALTERNATIVES ELIMINATED FROM FULL EVALUATION

Three primary alternative routes, including several variations, were evaluated for consistency with the Project objective of expanding the capacity of the existing transmission system to meet the demand for natural gas due to the extensive growth in the greater Sacramento Valley area. These alternatives are shown in Figure 3-1, and the various reasons for rejection are stated below.

3.2.1 Line 406/407 Northern Alternative

Route Description

The Line 406/407 Northern Alternative is in the northernmost alignment evaluated by PG&E (see Figure 3-1). The Line 406 portion of this alternative would begin at Lines 400 and 401 and follow County Road (CR) 14 east through agricultural lands, including orchards, row crops, and vineyards, across Interstate (I) 505 to CR-13. The route would continue east paralleling CR-13 through grasslands in the Dunnigan Hills, across I-5, to the town of Zamora, where it would intersect with the existing Line 172A ROW. The route would then parallel Line 172A to the tie-in point with Line 172A and Line 407, north of the town of Yolo. The total length of Line 406 under this alternative is approximately 16 miles.

Just south of Zamora, Line 407 would proceed east through row crops paralleling CR-13 to CR-102, where it would proceed south. At CR-14, the route would turn east and cross through row crops, orchards, and riparian woodland prior to crossing a small irrigation canal, the Knights Landing Ridge Cut, and the Sacramento River. It would also cross the East Canal, the River Ranch Conservation Bank, and the

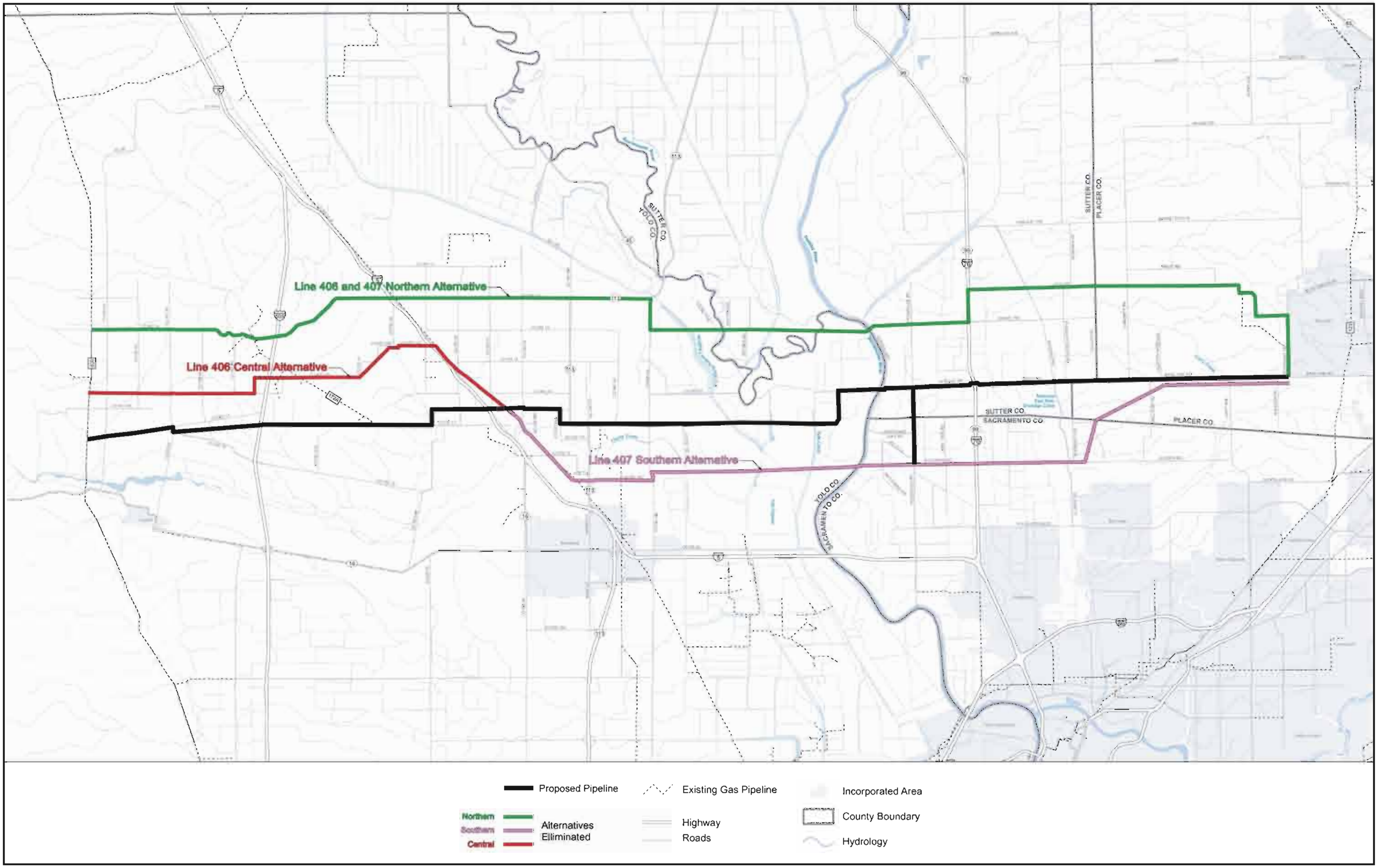
Sacramento River two more times before reaching the Natomas Basin in Sutter County.

East of the Sacramento River, this alternative would cross four conservation tracts operated by the Natomas Basin Conservancy. It would parallel Sankey Road east across the North Drainage Canal, and turn north at the junction of Sankey Road and State Route (SR) 70/99. It would then parallel SR 70/99 north before continuing east through rice fields toward Keys Road, which it would parallel east through private hunting clubs and agricultural lands consisting of rice fields and row crops. The route would cross Pleasant Grove Creek Canal and then parallel Phillip Road east through extensive vernal pool habitat toward the site of the new Roseville Energy Park. From this point, the route would jog south and east past the Roseville Regional Wastewater Treatment Plant and the upper reaches of Curry Creek and Pleasant Grove Creek to Line 123. The route would then turn south and parallel Line 123 along Fiddyment Road to the tie-in point with Line 123 at the junction of Fiddyment Road and Baseline Road. The total length of Line 407 under this alternative is approximately 33 miles.

Rationale for Elimination

This alternative was eliminated from further consideration because it would expose the proposed pipeline to the greatest risk from fault rupture, and much of the proposed ROW would be located on side-hills adjacent to CR-13. This alternative would locate the pipeline further away from the public thereby reducing the risks associated with potential upset. However, this alternative would result in greater impacts to biological resources, particularly vernal pool habitat, involve more than 40 waterway crossings, and impact local agricultural production more extensively than the proposed Project.

This alternative would not accomplish as adequately the Project objective of supplying natural gas to new developments because the route is farther than the proposed Project from many of the developments that are planned in the area, such as the Sacramento Metro Air Park, the Place Vineyards Specific Plan area, and North Natomas. This distance would require additional extensions that could result in substantially greater construction impacts (traffic, noise, and air quality). Due to its additional length, greater construction impacts, the number of river crossings, potential disturbance to vernal pool habitat and agricultural resources, this alternative was eliminated from further analysis and consideration.



Source: Adapted from PG&E 2008.

Michael Brandman Associates

NORTH

0 2 4 8 Miles

Figure 3-1
Alternatives Eliminated

3.2.2 Line 407 Southern Alternative

Route Description

The Line 407 Southern Alternative would begin at existing Line 172A and the terminus of Line 406. Under this alternative, Line 406 would be constructed as described in Section 2.0, Project Description. From the Line 172A connection, this alternative would travel southeast to CR-99 just north of the City of Woodland, where it would then travel east to SR-113 and parallel CR-18C prior to reaching CR-102. At CR-102, the route would turn northeast and extend to CR-18B, where it would continue east through agricultural lands consisting of mixed row crops and rice fields. The route would cross Cache Creek, three extensions of the Knights Landing Ridge Cut, the Tule Canal, and one other smaller canal before reaching walnut orchards near the western side of the Sacramento River crossing.

East of the Sacramento River, this route would parallel West Elverta Road through rice fields, passing the northern edges of the Sacramento International Airport and the new Sacramento Metro Air Park development area. Proceeding eastward, the route would cross numerous irrigation canals and ditches, as well as the Natomas East Main Drainage Canal (Steelhead Creek). At the town of Elverta, the route would parallel an existing energy utility corridor northeast through agricultural land and the Placer Vineyards Specific Area Plan development area toward Baseline Road. Four crossings of small tributaries to Steelhead Creek would be required before the route would reach Baseline Road, which it would parallel east to the tie-in with Line 123. The total length of Line 407 under this alternative would be approximately 22 miles.

Rationale for Elimination

This alternative was eliminated from further consideration given that this alignment would require crossing more tributaries of Steelhead Creek and more sensitive vernal pool habitat. This alternative would also require longer crossings over agricultural tracts. Construction of this alternative would also affect more people than the proposed Project because portions would be constructed through the suburban communities of North Natomas and Elverta. In addition, this alternative would require crossing Cache Creek, which provides recreational opportunities as well as habitat for a number of special-status species.

The proposed Project would cross two small tributaries to Steelhead Creek and the creek itself, while the southern alternative would cross five small tributaries and the creek itself.

Based on maps from the United States Fish and Wildlife Service (USFWS) and Placer County, the southern alternative would cross more distance through vernal pool complexes than the proposed Project, due to its greater length and the location of mapped vernal pool complexes (the proposed Project would cross approximately 6.8 miles of potential vernal pool habitat and roughly 2.5 miles of mapped vernal pool complex; Line 407 Southern Alternative would cross approximately 8.0 miles of potential vernal pool habitat and roughly 3.5 miles of mapped vernal pool complex).

While a wetland delineation was not completed for the southern alternative segment, preliminary field visits revealed that this segment was more likely to impact vernal pools (that may or may not occur in complexes) due to the lack of development in the area and local topography (numerous depressions with unique vegetation were observed outside of the mapped vernal pool complexes during reconnaissance-level field surveys). Additionally, the proposed Project is closer to an existing road and existing residences where land uses and disturbance make vernal pools less likely to remain undisturbed.

3.2.3 Line 406 Central Alternative

Route Description

From Lines 400 and 401, the Line 406 Central Alternative would follow CR-16 to I-505, then head north through a grape vineyard to align with CR-15B on the west side of the highway. The route would continue east on CR-15B through the Dunnigan Hills and across Smith Creek until it becomes CR-93. From this location, it would head northeast along an ephemeral stream to CR-14A, then proceed east on CR-14 across I-5 to Line 172A. It would then parallel Line 172A south to the tie-in point with Line 172A and Line 407, north of the town of Yolo. The total length of Line 406 under this alternative would be 15.5 miles.

Rationale for Elimination

This alternative was initially considered given that it would parallel an ephemeral stream through natural habitats to CR-14A. However, this alternative would not achieve the goal of reducing or avoiding potentially significant impacts to habitat potentially utilized by special-status species and local water features associated with the Project. This alternative would be longer than the Project and would result in additional construction-related impacts (e.g., dust, noise, traffic).

3.2.4 System/Facility Alternatives

Route Description

Under this alternative, PG&E would, to the extent feasible, construct the Project within existing ROW already owned by PG&E. This alternative would substantially increase the length of the Project by 23 miles, resulting in a total of approximately 63 miles of parallel transmission pipeline. This alternative would also maintain the proposed pipeline diameter of 30 inches to provide sufficient incremental capacity to serve the same amount of customer load growth that the recommended design can accommodate.

Rationale for Elimination

This alternative would consist of approximately 15 separate projects and was eliminated from further consideration given that the additional pipeline length would be expected to generate substantially greater construction impacts (traffic, noise, and air quality). Although this alternative would stay within existing ROWs, to the extent feasible, given the absence of any existing PG&E infrastructure east of Line 172A, this alternative would still require a substantial number of waterway crossings. Construction of this alternative would also affect more people than the proposed Project because portions would be constructed in proximity to the towns of Yolo and Woodland. Due to its additional length, the number of river crossings, and lack of offsetting benefits such as avoidance of biological or other resources, this alternative was eliminated from further analysis and consideration.

This alternative design would increase PG&E's cost to serve the projected load growth versus the recommended design and does not increase the level of service reliability available to customers in the region.

Detailed surveys were not completed for a Systems Alternative study area; however, due to the greater length of pipeline required to construct this alternative, it is likely that greater environmental impacts would result to resources such as air quality, agricultural uses, biological resources and water quality than the proposed alternative.

3.3 ALTERNATIVES EVALUATED IN EIR

A No Project Alternative and twelve options have been proposed for the alignment in order to minimize or eliminate environmental impacts of the proposed Project. The twelve options, labeled A through L, are described below and the impacts associated with each option are analyzed in each resource section (Sections 4.1 through 4.14) in comparison to the portion of the proposed route that has been avoided as a result of the option. Options have been named so that a preferred route could be selected using a variety of options. Figures 3-2A through 3-2K show the twelve options.

3.3.1 No Project Alternative

Description

Under the No Project Alternative, a natural gas pipeline would not be constructed between existing Lines 400 and 401 in Yolo County and the existing Line 123 in Placer County. PG&E's studies indicate that the natural gas transmission and distribution system may not be able to serve customers reliably and planned development in Yolo, Sacramento, Sutter, and Placer counties by 2009 (see Section 2.0, Project Description). Additionally, continued growth in those counties would put further strain on existing natural gas infrastructure, and could result in emergency restriction or interruption of services.

Required Agency Approvals

No agency approvals would be required under the No Project Alternative.

Reason for Consideration

The No Project Alternative was considered in order to comply with the CEQA Guidelines section 15126.6(e), which requires the analysis of a "no project" alternative.

3.3.2 Route Options

Option A

From Lines 400 and 401, Option A would follow CR-16 to I-505, then head north through a grape vineyard to align with CR-15B on the west side of I-505. The route would continue east on CR-15B through the Dunnigan Hills and across Smith Creek until CR-15B becomes CR-93.

From this juncture, this alternative would continue east from the intersection of CR-15B and CR-93, and proceed cross-country to Line 172A just south of the town of Dufour. It would then parallel Line 172A south to the tie-in point with Line 172A and Line 407, north of the town of Yolo. This option would increase the overall pipeline length by approximately 2,200 feet. Figure 3-2B shows Option A.

Required Agency Approvals

The required agency permits and approvals for Option A would be similar to those for the proposed Project.

Reason for Consideration

This route alternative would meet all of the basic Project objectives, would reduce segmenting agricultural fields in Yolo County and shift potential construction noise, air emissions, and traffic impacts to a more sparsely populated area further to the north.

Option B

From Lines 400 and 401, approximately 1.5 miles north of the proposed Project, Option B would extend east along farm roads, crossing CR-86 and aligning with CR-16. The route would continue along the south side of CR-16 for approximately 3 miles to CR-86, and then turn south along farm roads to a point intercepting the proposed I-505 crossing. This option would increase the overall pipeline length by approximately 2,640 feet. Figure 3-2B shows Option B.

Required Agency Approvals

The required agency permits and approvals for Option B would be similar to those for the proposed Project.

Reason for Consideration

This route alternative would meet all of the basic Project objectives, would reduce segmenting local agricultural fields in Yolo County and shift potential construction noise, air emissions, and traffic impacts to a more sparsely populated area further to the north.

Option C

Option C would follow the proposed alignment of Line 406 from the Capay Metering Station to the Hungry Hollow Canal, which it would parallel northeast until crossing to line up with an unnamed farm road to the east. This alternative would cross CR-85 and extend east along the farm road and the northern edge of Microp Limited Property, APN # 048-140-140-191. At the end of the property, the route would turn south along another unnamed farm road until it intersects the proposed Line 406 route, which it then would follow to the Yolo Junction Station. This option would increase the overall pipeline length by roughly 1,150 feet. Figure 3-2C depicts Option C.

Required Agency Approvals

The required agency permits and approvals for Option C would be similar to those for the proposed Project.

Reason for Consideration

This route alternative would meet all of the basic Project objectives and would reduce segmenting agricultural fields east of CR-85.

Option D

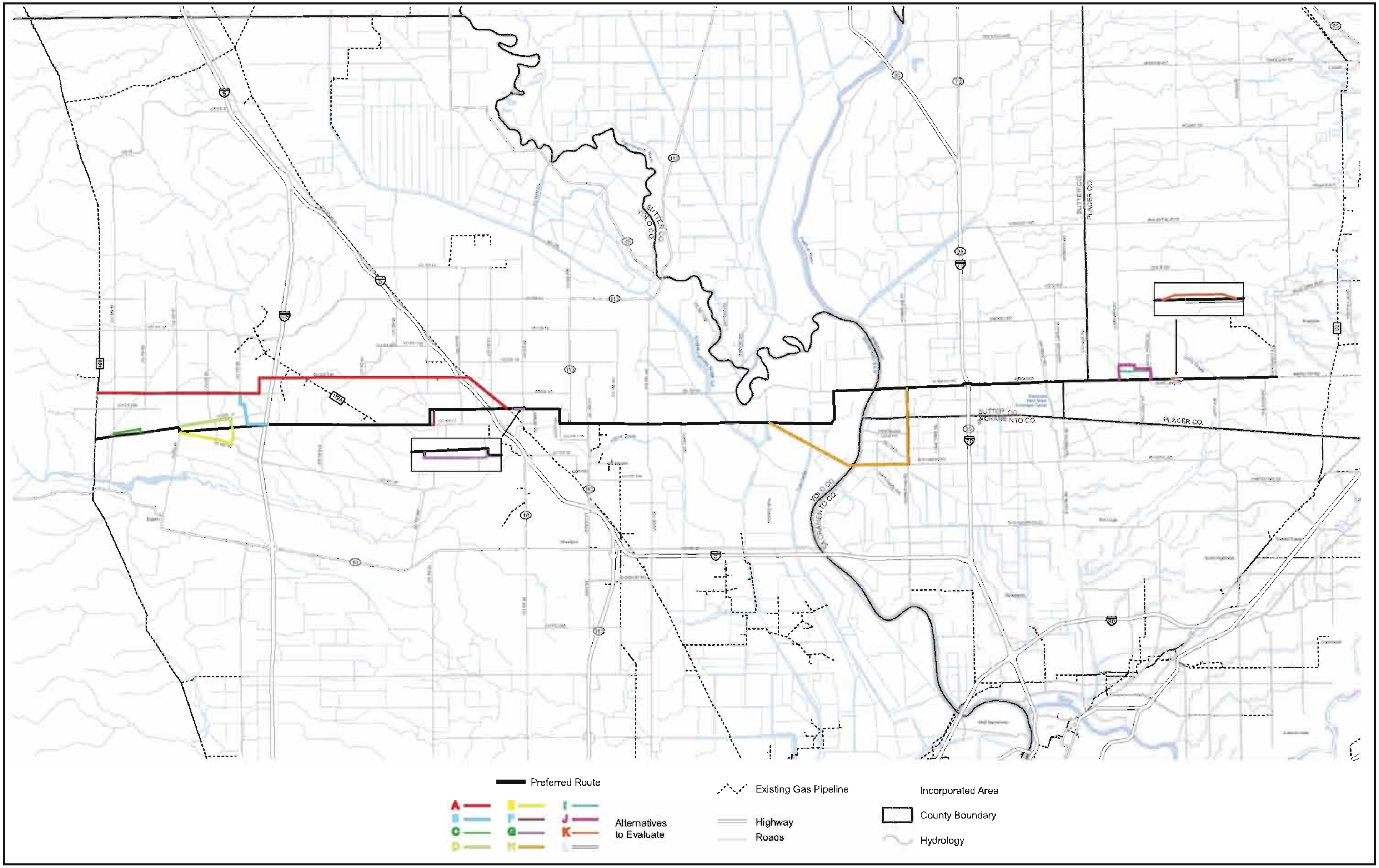
Option D would involve a minor variation to the proposed Line 406 in the vicinity of the Hungry Hollow area in north-central Yolo County, but it would maintain Line 406 within CR-17 east of CR-87, and then extend south after crossing an unnamed irrigation lateral where it would realign with the proposed Line 406 route, just west of the I-505 HDD crossing. East of I-505, this alternative would follow the same alignment as the proposed Project. This option would increase slightly the total length of the pipeline. Figure 3-2D shows Option D.

Required Agency Approvals

The required agency permits and approvals for Option D would be similar to those for the proposed Project.

Reason for Consideration

This route alternative would meet all of the basic Project objectives and would reduce segmenting agricultural fields in the Hungry Hollow area. However, this alternative would require locating the Project closer to several residences situated along CR-17.



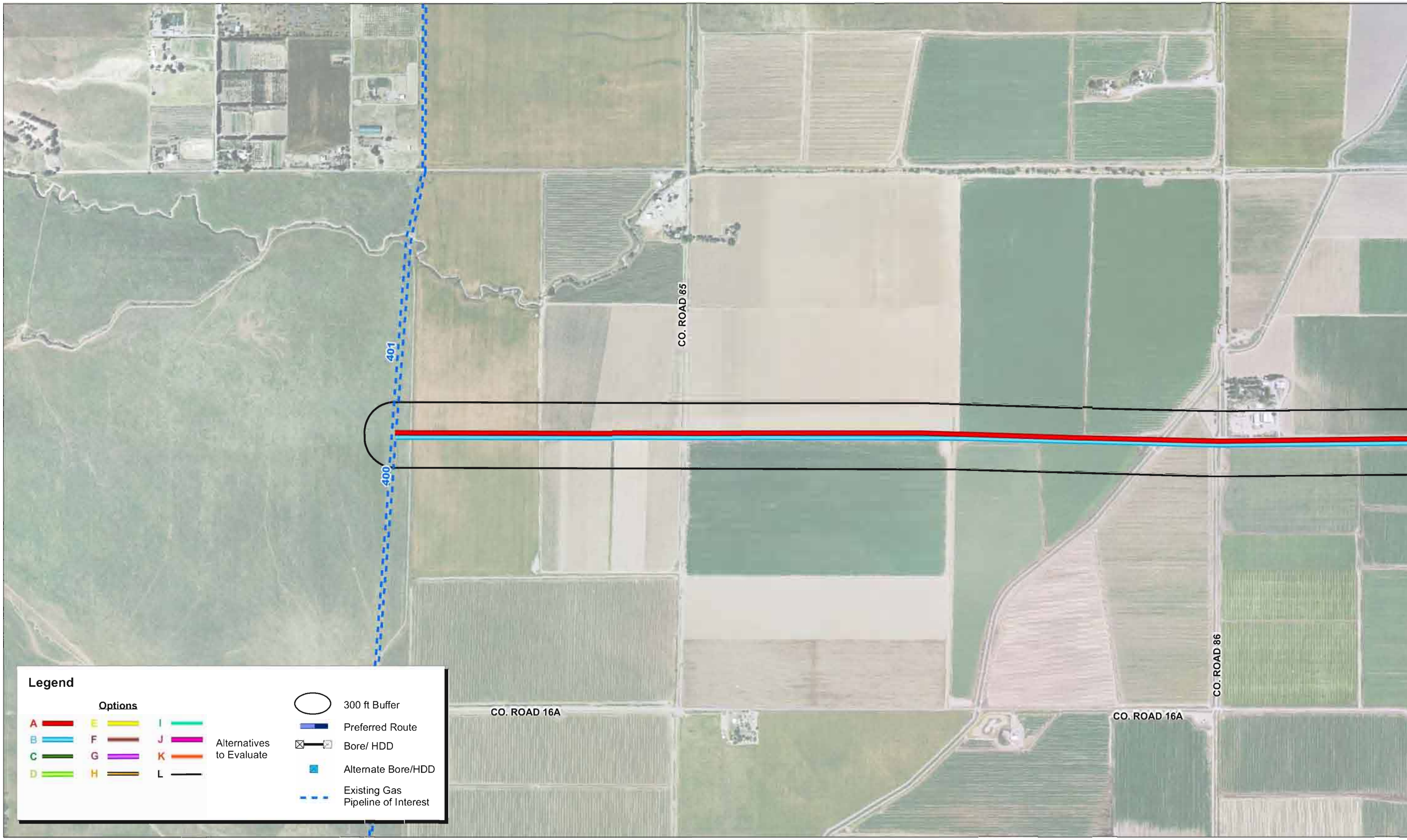
Source: PG&E, March 2009.

Michael Brandman Associates

4.5 2.25 0 4.5 Miles

NORTH

Figure 3-2A
Alternatives Evaluated

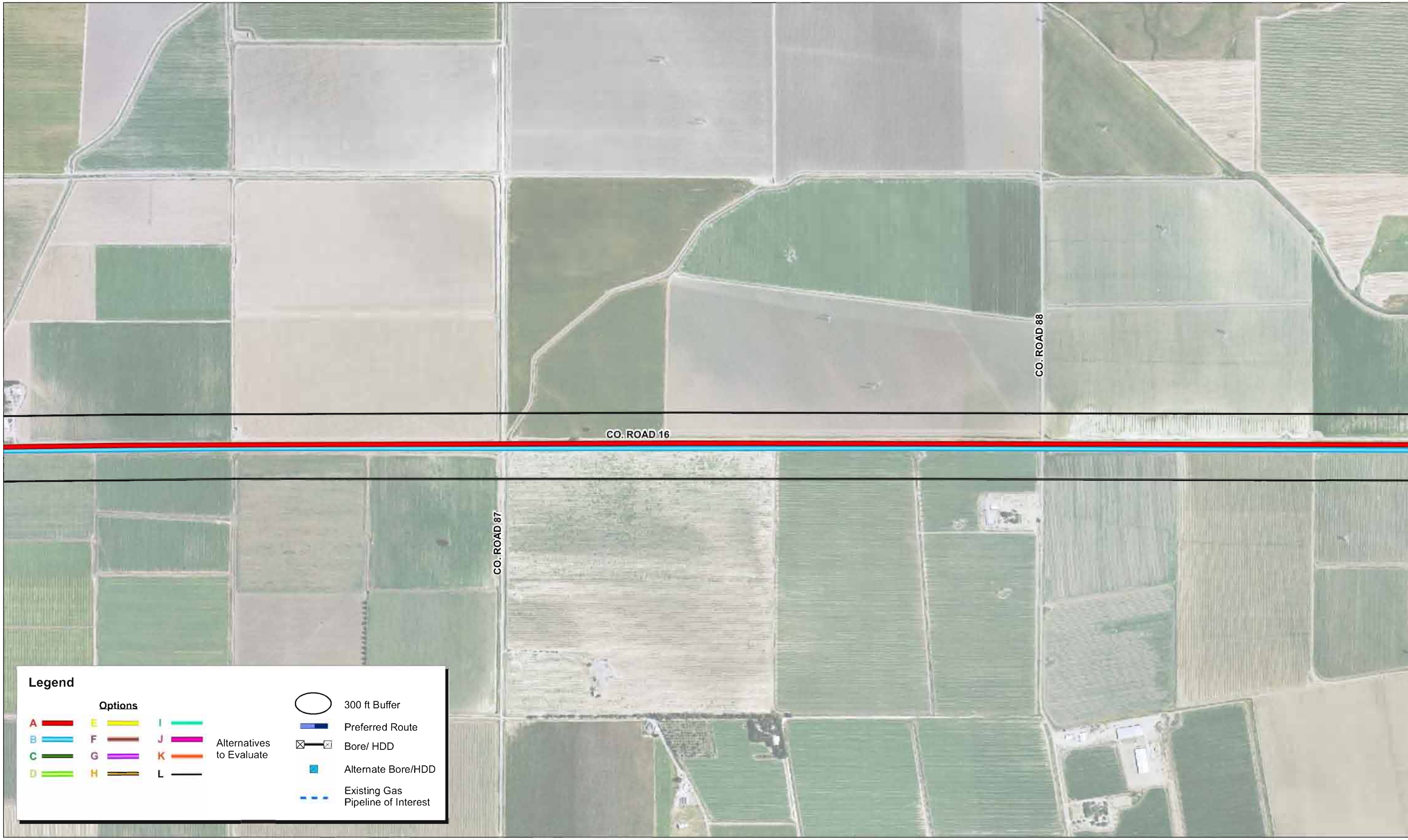


Source: Adapted from PG&E, 2009.

Michael Brandman Associates

900 450 0 900 Feet

Figure 3-2B
Alternative Options A and B
Map 1 of 7

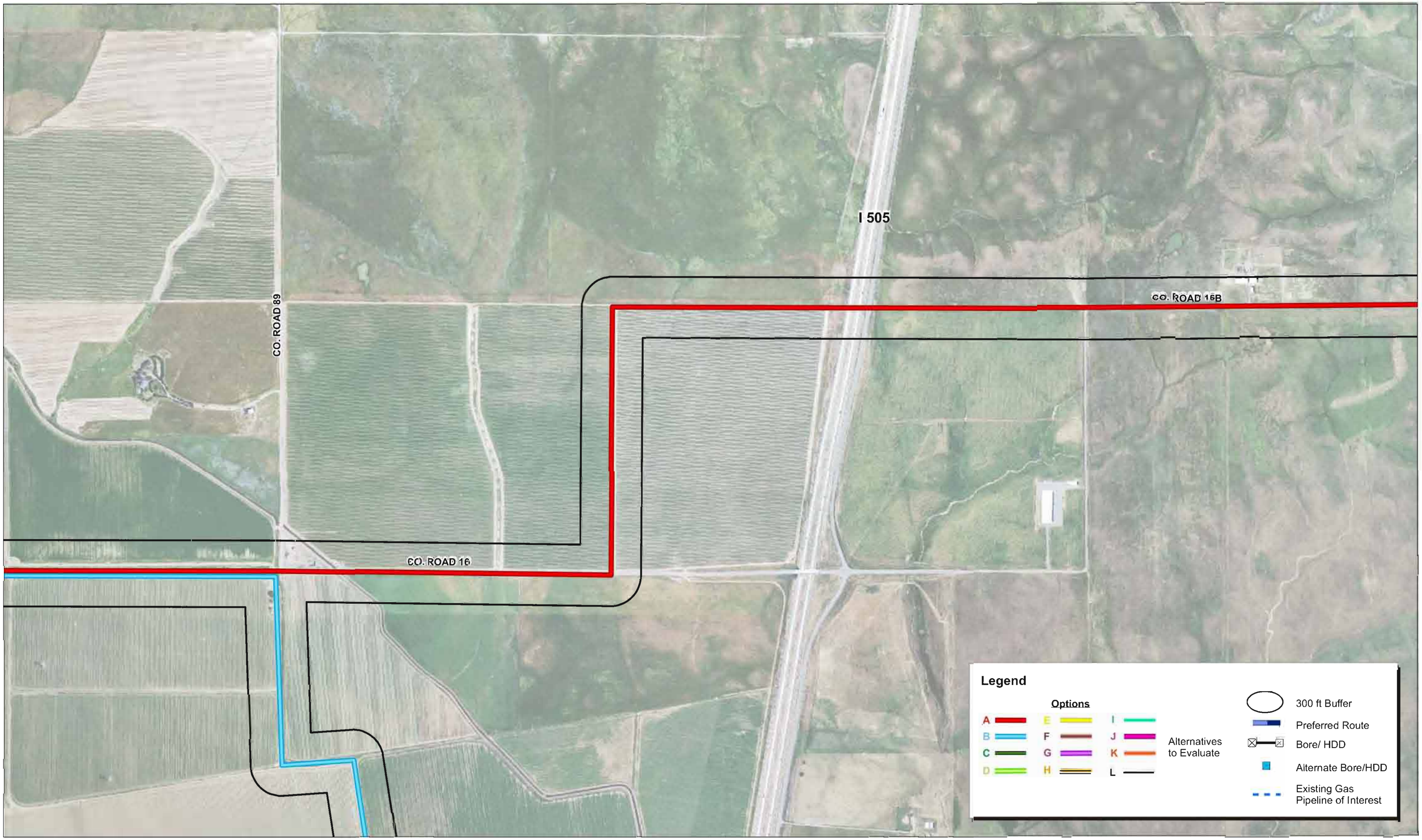


Source: Adapted from PG&E, 2009.

Michael Brandman Associates

900 450 0 900 Feet

Figure 3-2B
Alternative Options A and B
Map 2 of 7

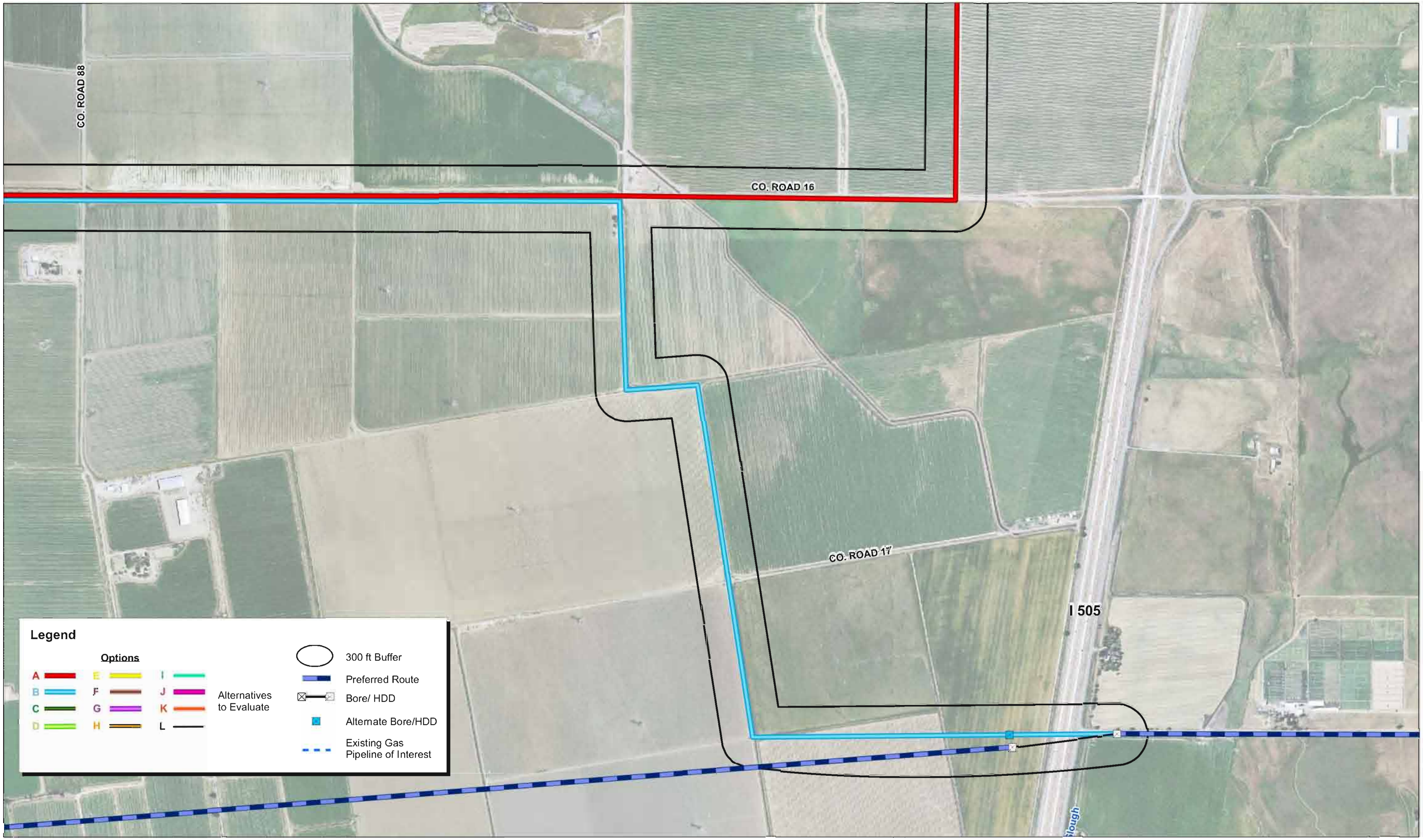


Source: Adapted from PG&E, 2009.

Michael Brandman Associates

900 450 0 900 Feet

Figure 3-2B
Alternative Options A and B
Map 3 of 7



Source: Adapted from PG&E, 2009.

Michael Brandman Associates

900 450 0 900 Feet

Figure 3-2B
Alternative Options A and B
Map 4 of 7

Source: Adapted from PG&E, 2009.

Michael Brandman Associates

900 450 0 900 Feet

Figure 3-2B
Alternative Options A and B
Map 5 of 7

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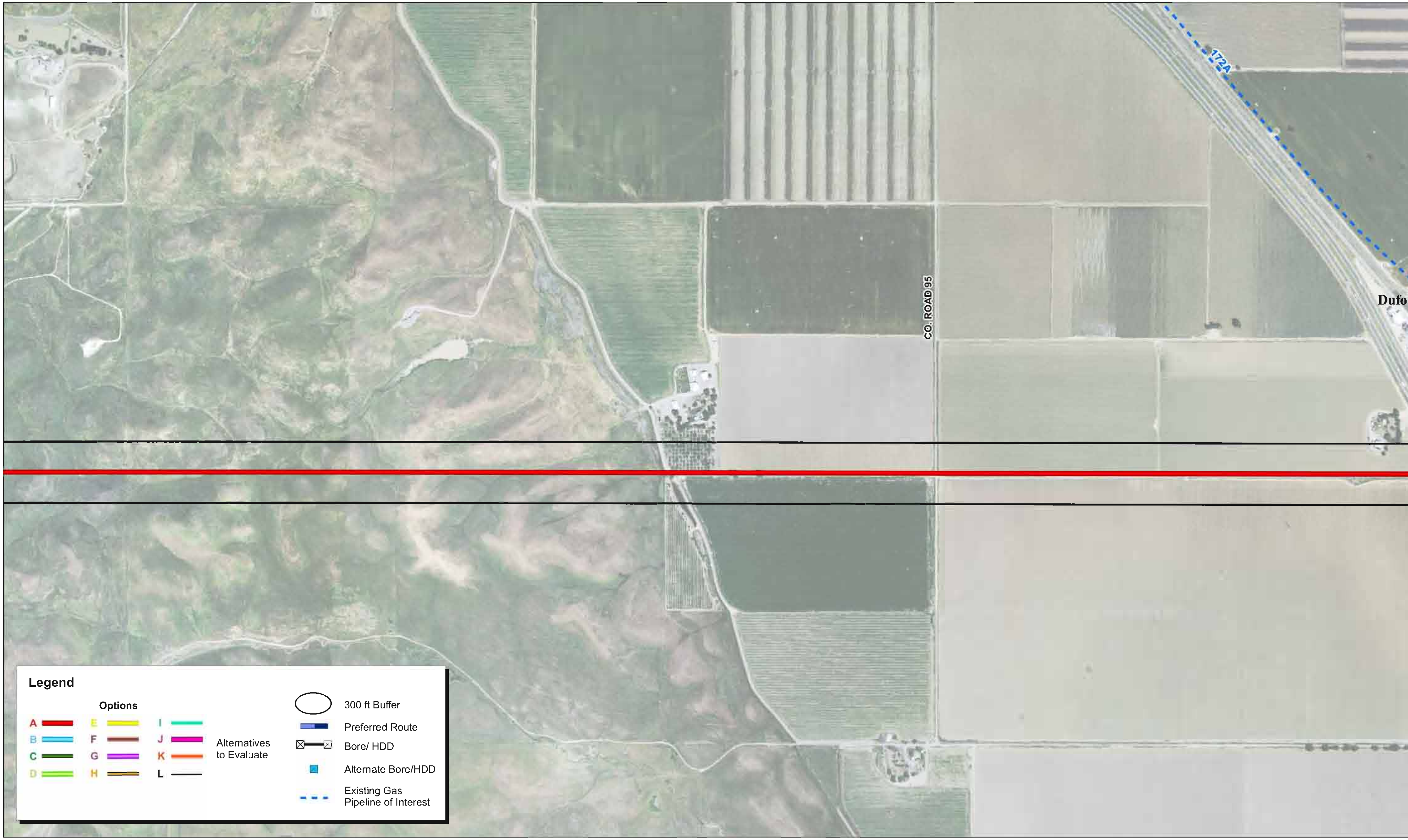
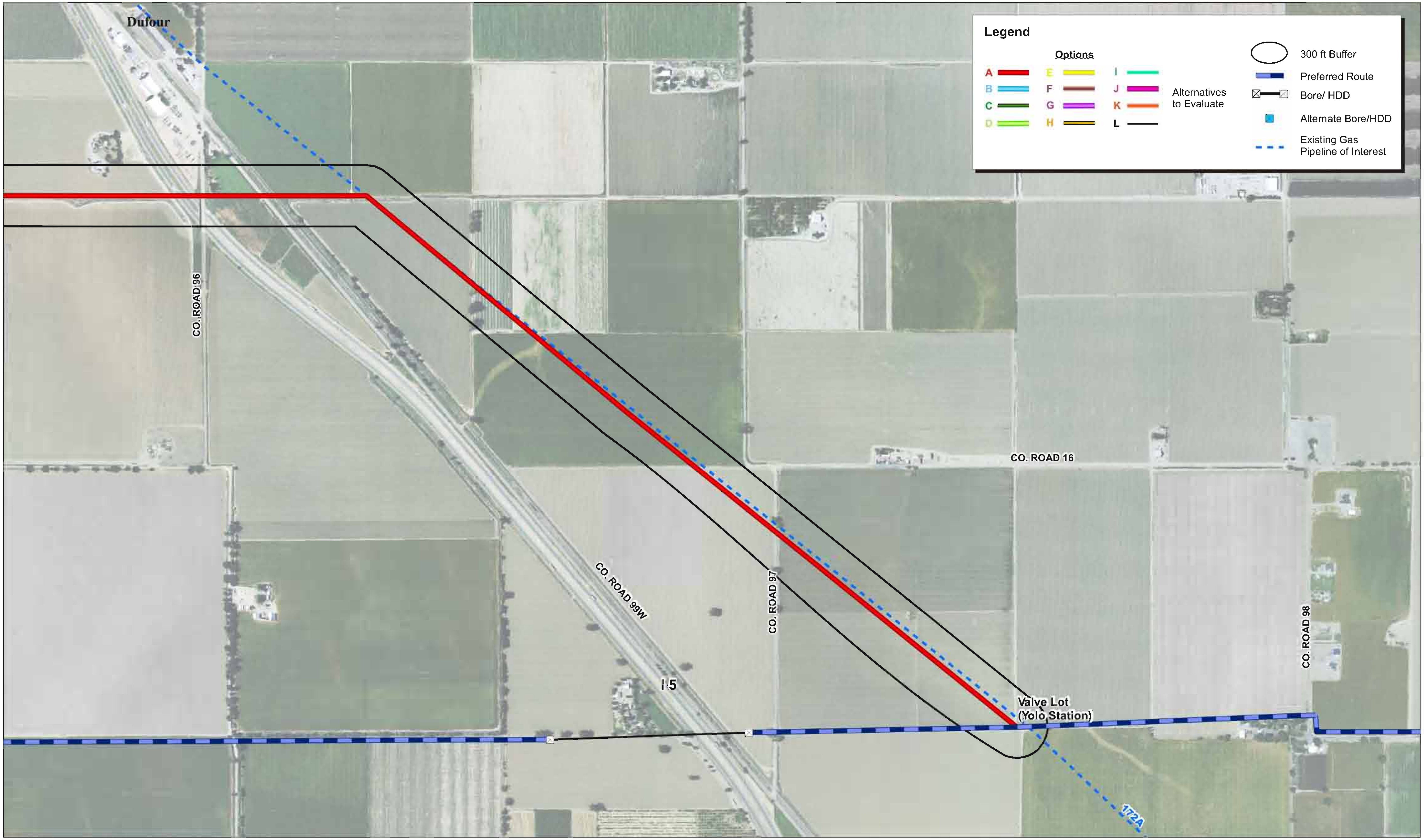


Source: Adapted from PG&E, 2009.

Michael Brandman Associates

900 450 0 900 Feet

Figure 3-2B
Alternative Options A and B
Map 6 of 7

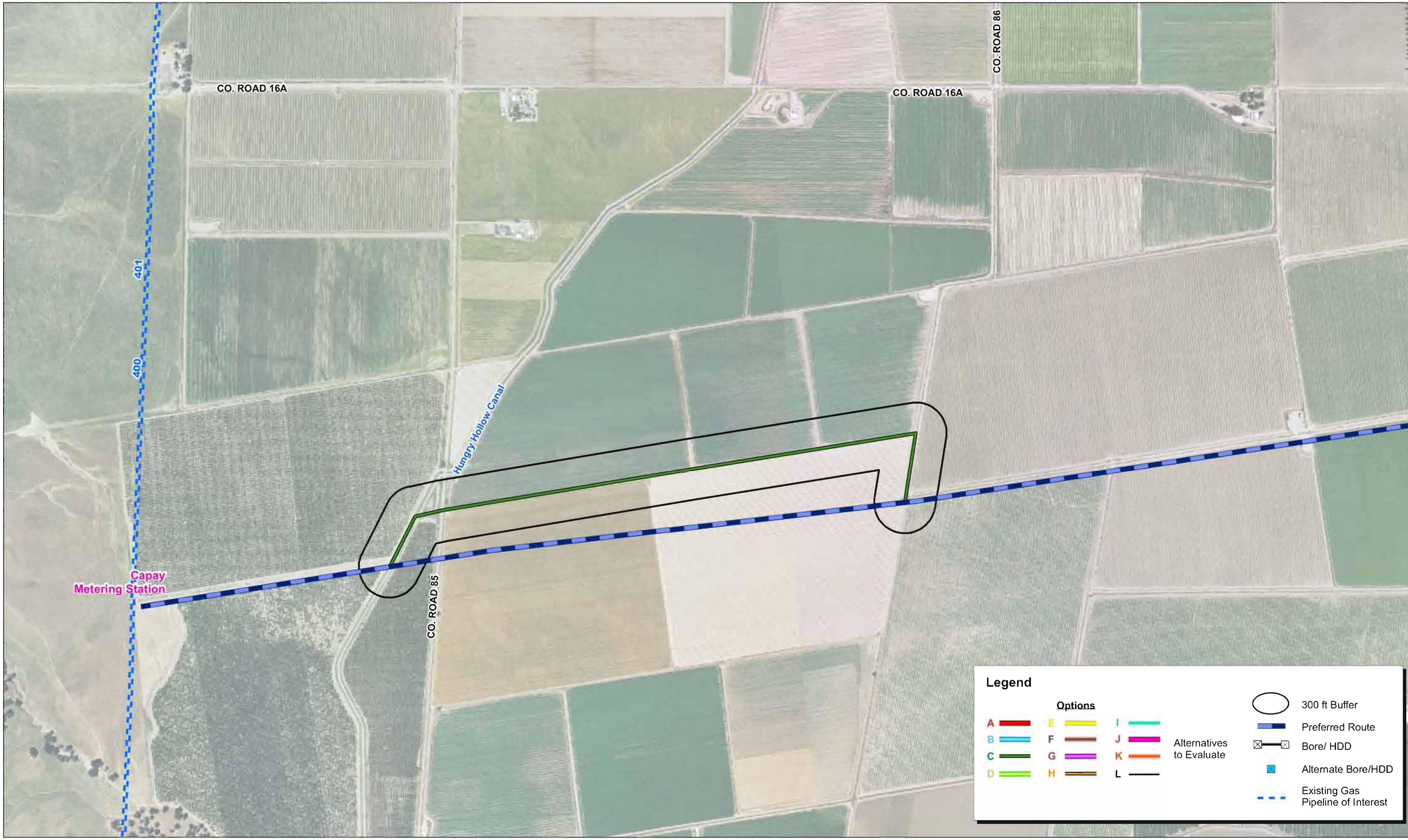


Source: Adapted from PG&E, 2009.

Michael Brandman Associates

900 450 0 900 Feet

Figure 3-2B
Alternative Options A and B
Map 7 of 7

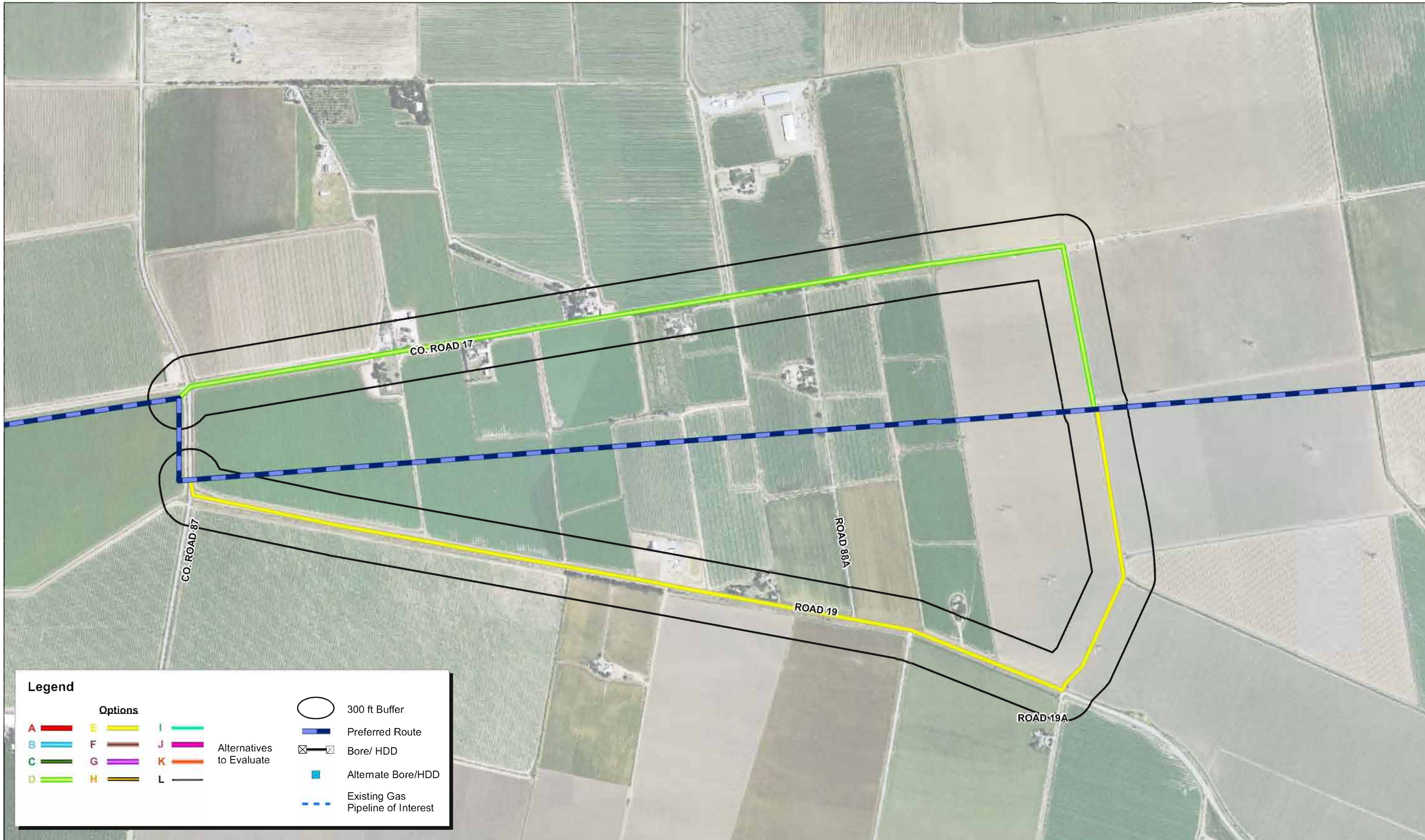


Source: Adapted from PG&E, 2009.

Michael Brandman Associates

900 450 0 900 Feet

Exhibit 3-2C
Alternative Option C
Map 1 of 1



Source: Adapted from PG&E, 2009.

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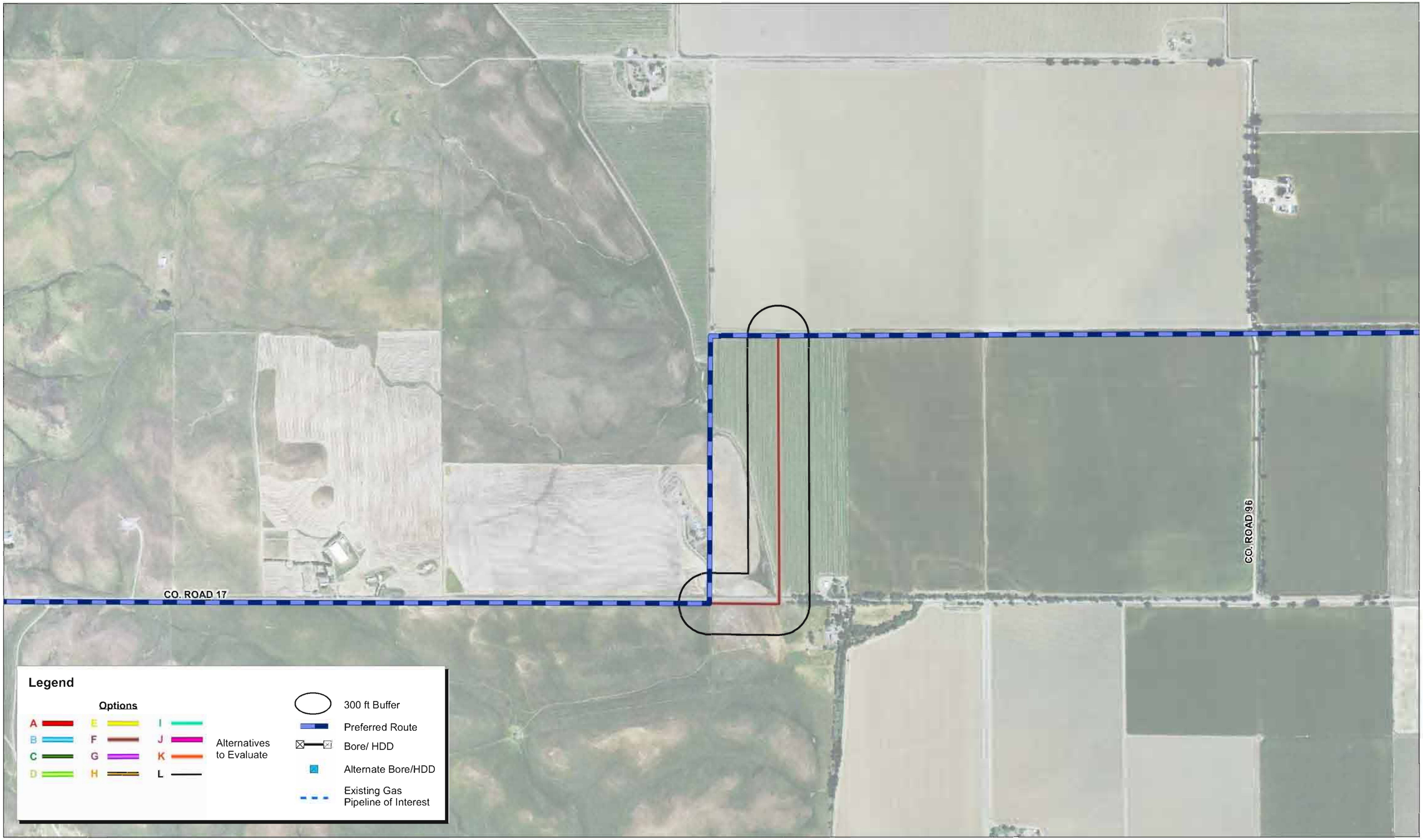
Exhibit 3-2D
Alternative Options D and E
Map 1 of 1



Source: Adapted from PG&E, 2009.

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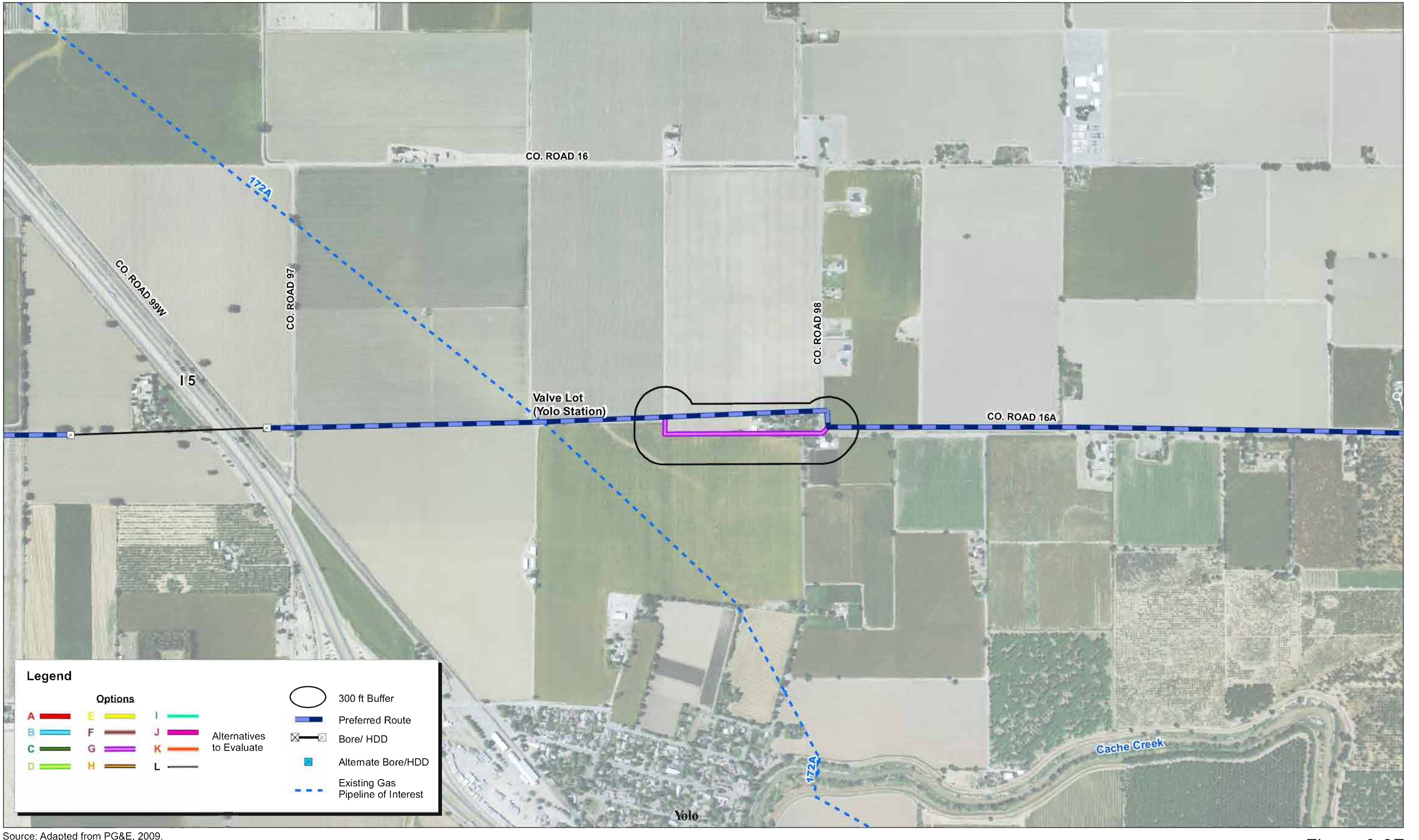
900 450 0 900 Feet

Figure 3-2E
Alternative Option F
Map 1 of 1



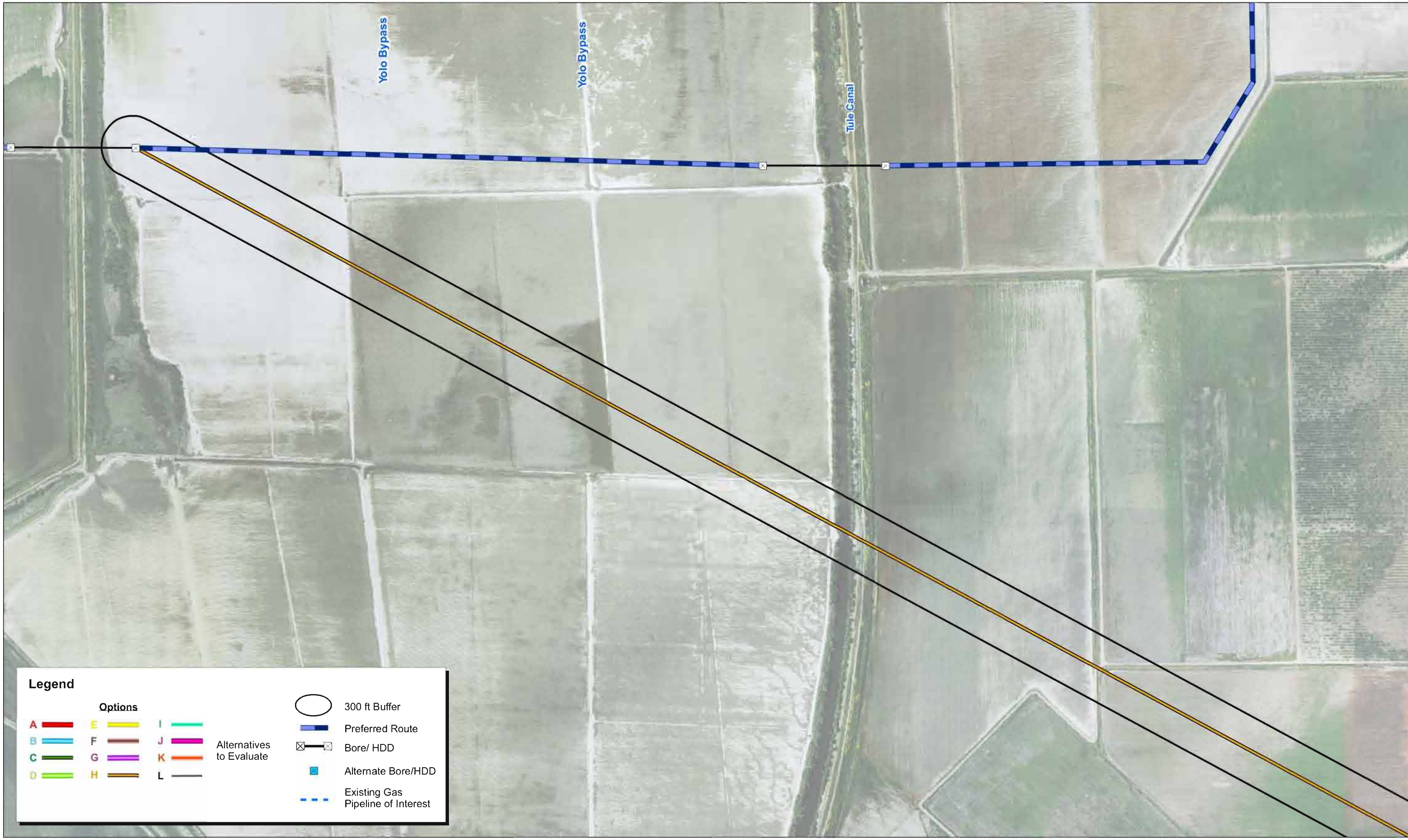
Source: Adapted from PG&E, 2009.

Michael Brandman Associates

900 450 0 900 Feet

Figure 3-2F
Alternative Option G
Map 1 of 1

23440005 • 03/2009 | 3-2f_alt_option_g_11x17.cdr



Source: Adapted from PG&E, 2009.

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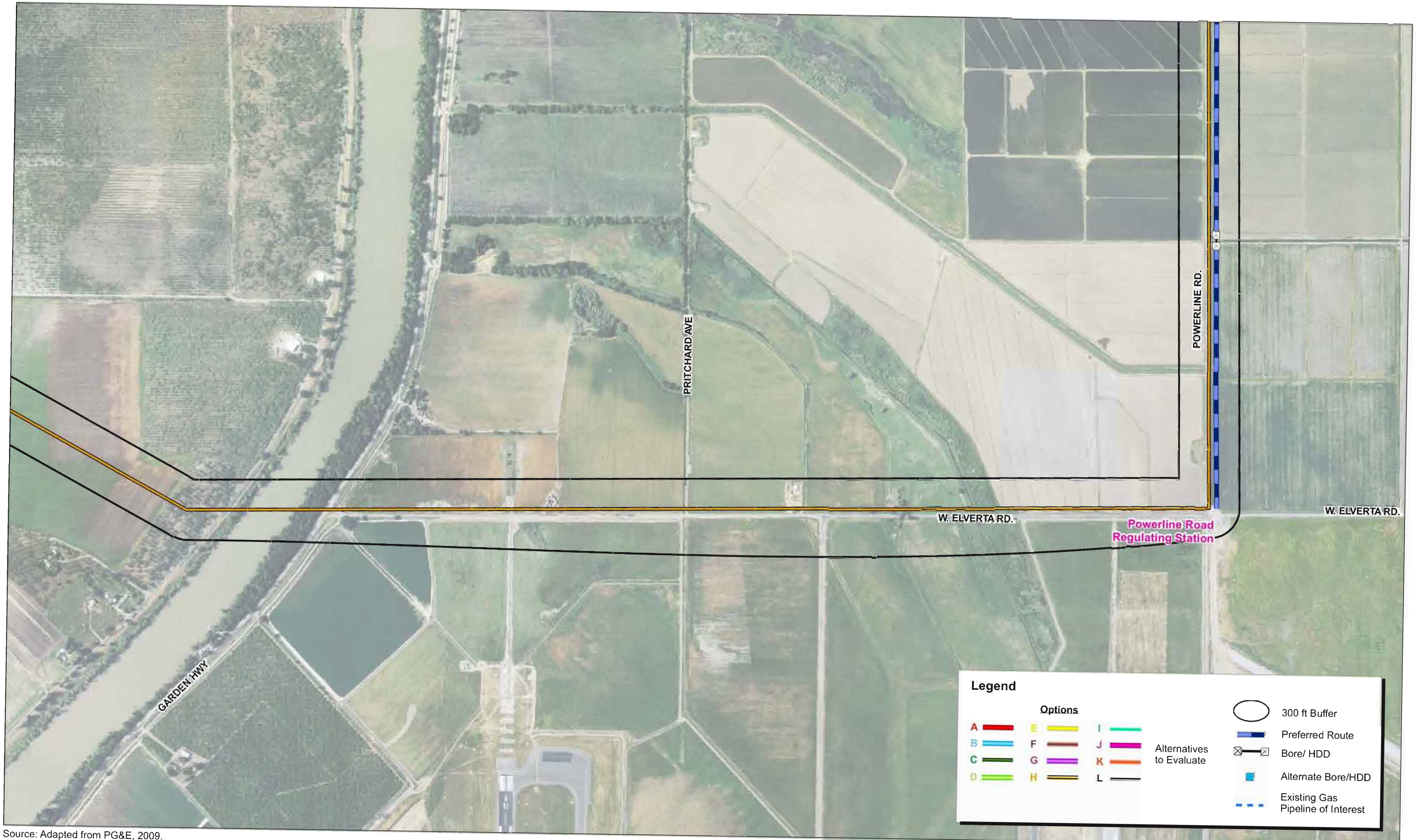
900 450 0 900 Feet

Exhibit 3-2G
Alternative Option H
Map 1 of 3



Source: Adapted from PG&E, 2009.

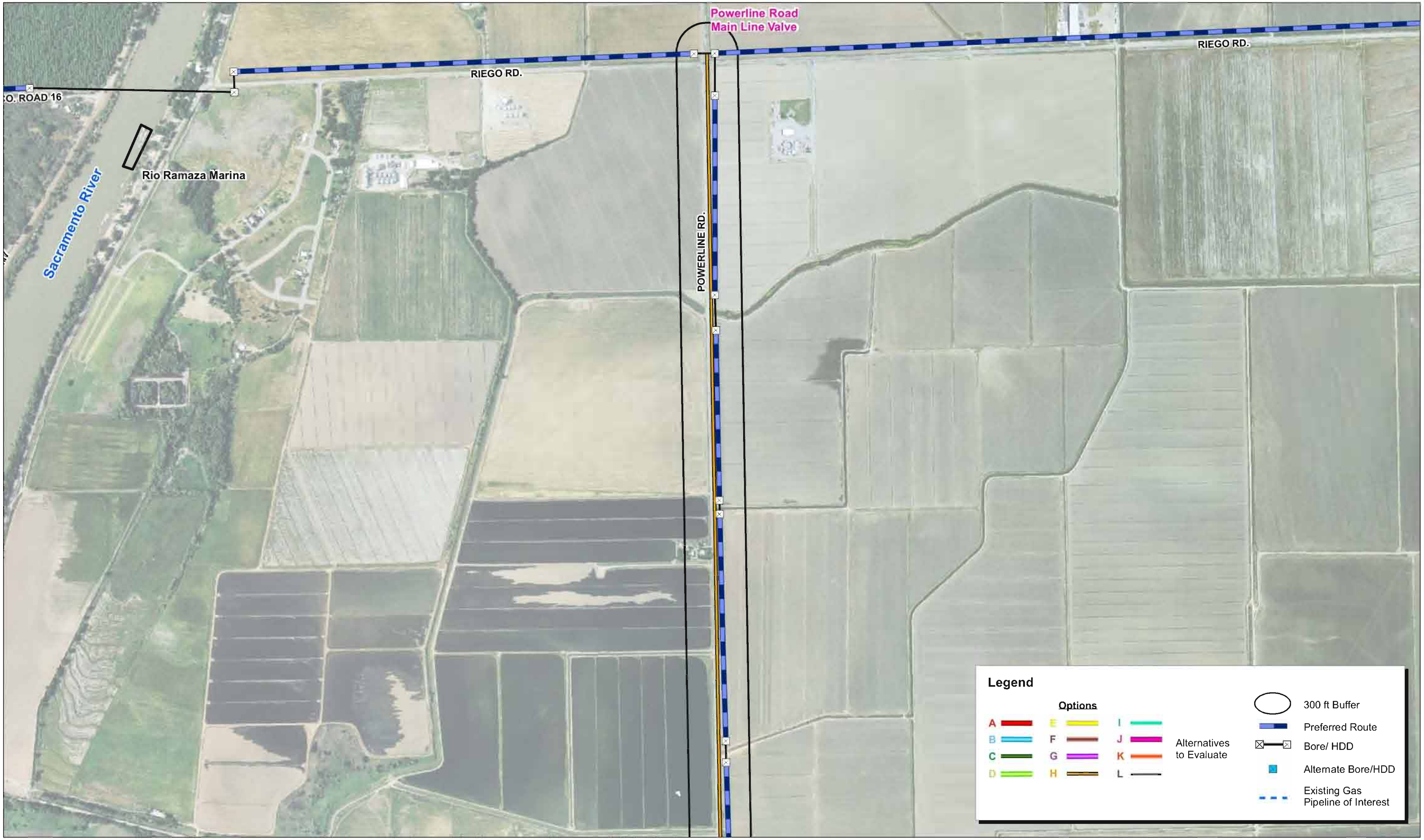
Michael Brandman Associates

NORTH

900 450 0 900 Feet

23440005 • 03/2009 | 3-2g_alt_option_h_2of3.cdr

Exhibit 3-2G
Alternative Option H
Map 2 of 3



Source: Adapted from PG&E, 2009.

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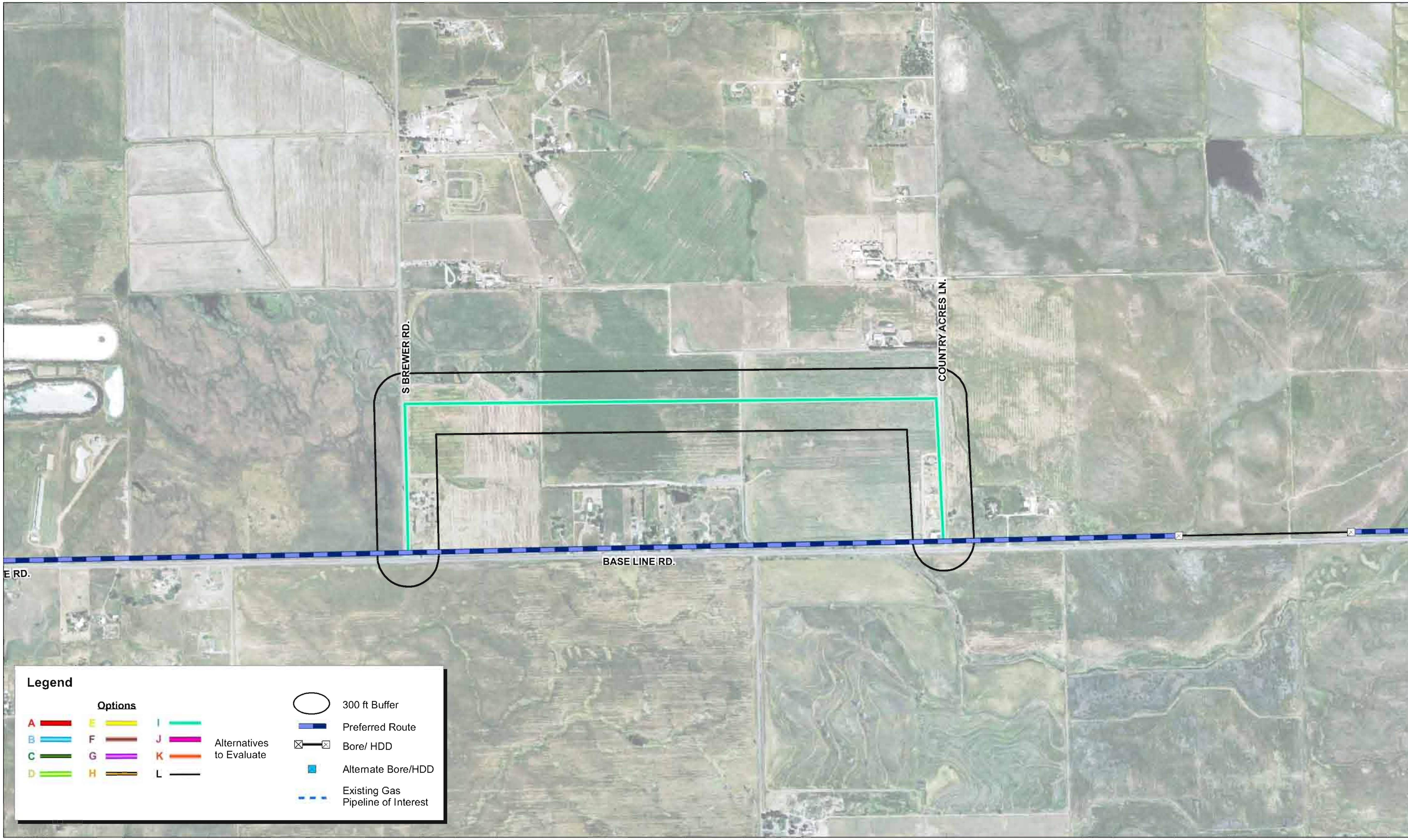
23440005 • 03/2009 | 3-2g_alt_option_h_3of3.cdr

Exhibit 3-2G
Alternative Option H
Map 3 of 3



Source: Adapted from PG&E, 2009.

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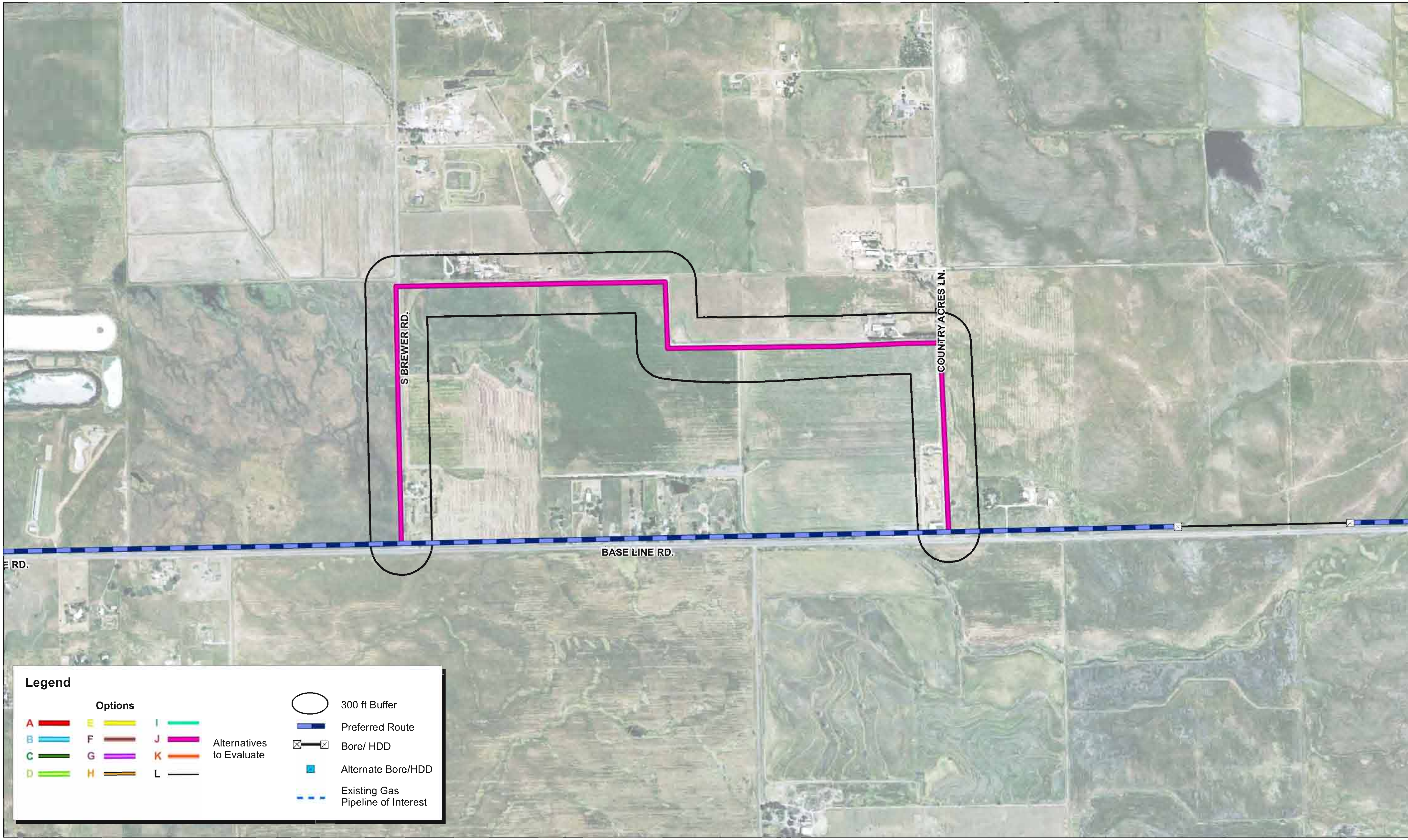
900 450 0 900 Feet

Figure 3-2H
Alternative Option I
Map 1 of 1



Source: Adapted from PG&E, 2009.

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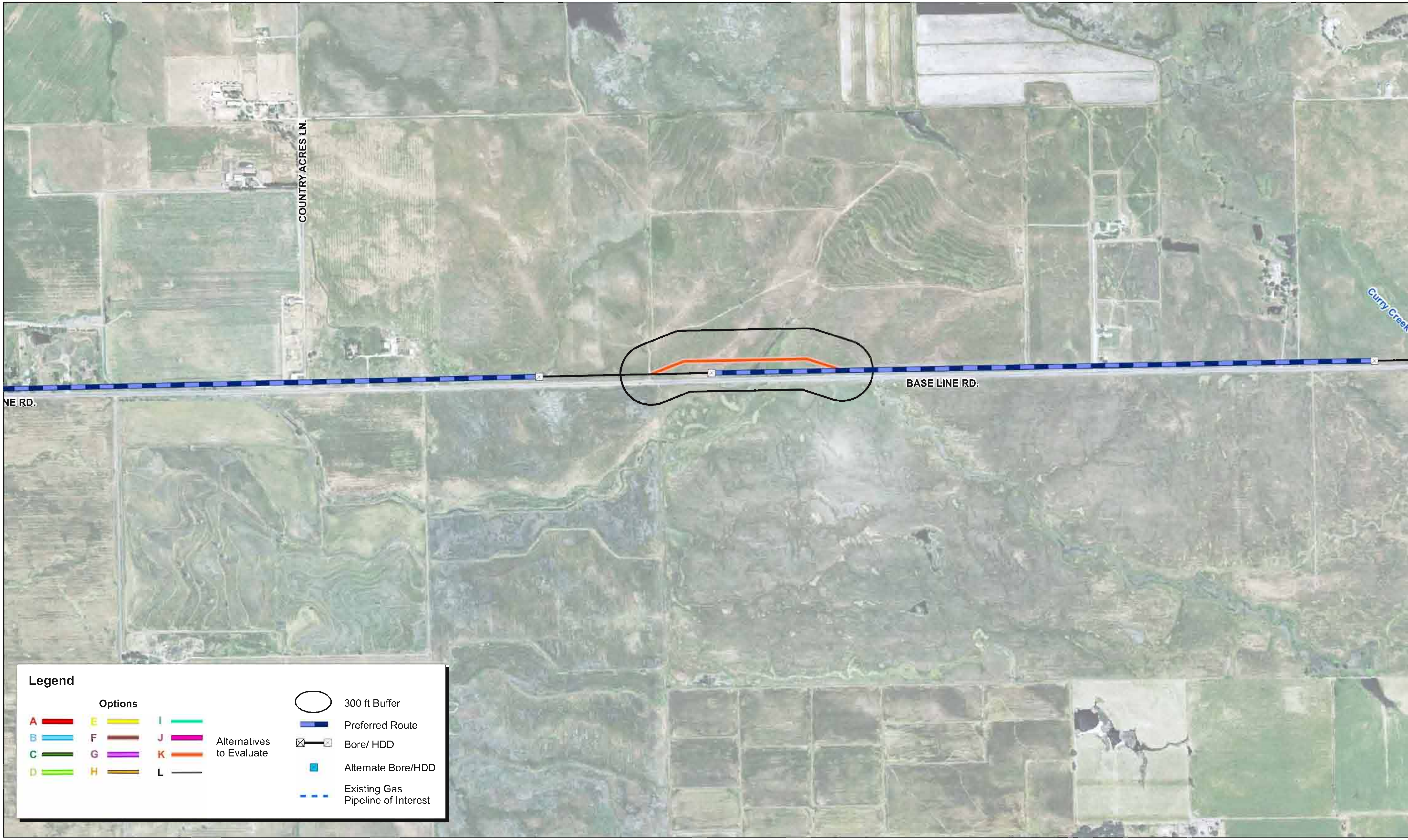
900 450 0 900 Feet

Figure 3-2I
Alternative Option J
Map 1 of 1



Source: Adapted from PG&E, 2009.

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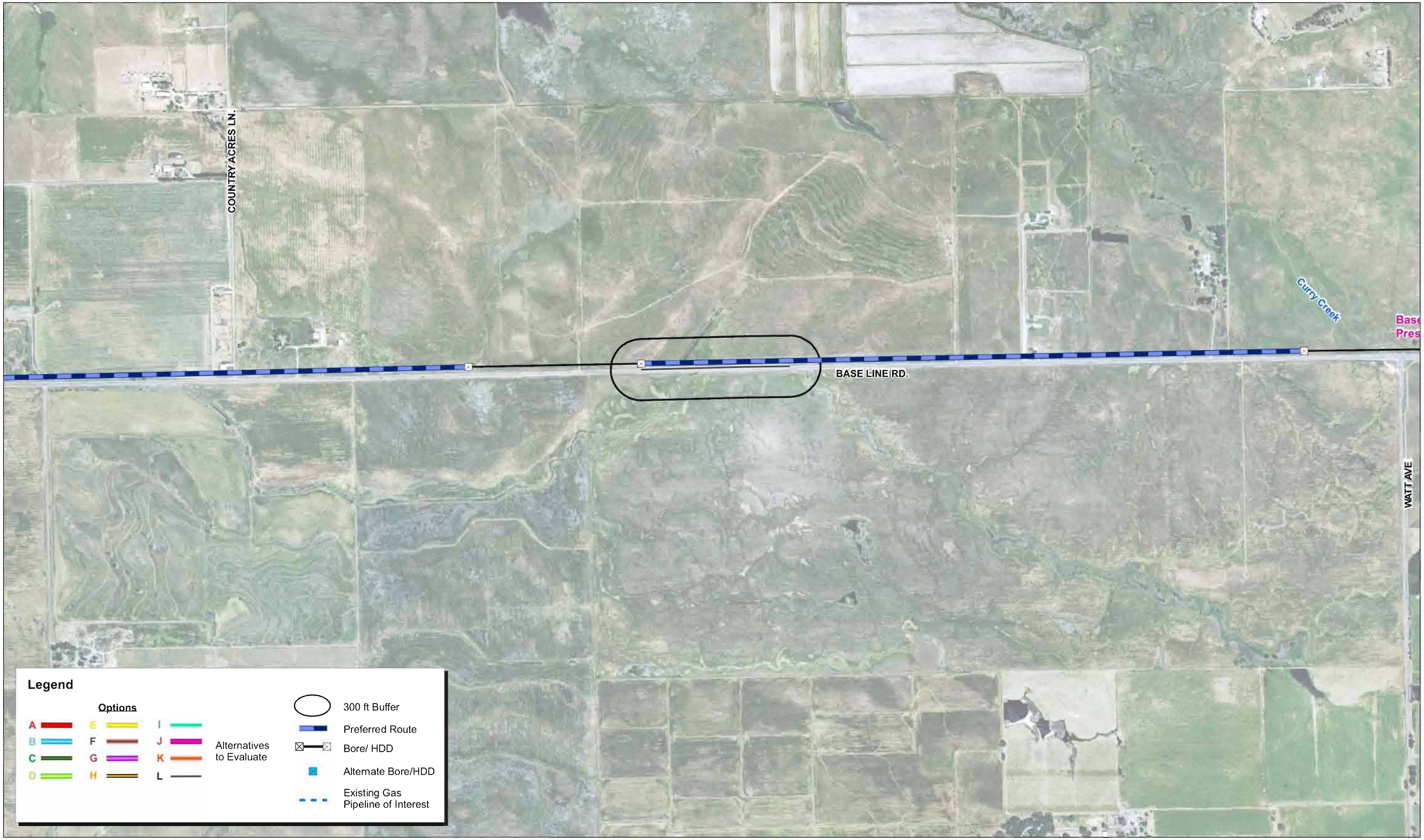
900 450 0 900 Feet

Figure 3-2J
Alternative Option K
Map 1 of 1



Source: Adapted from PG&E, 2009.

Michael Brandman Associates

Figure 3-2K
Alternative Option L
Map 1 of 1

Option E

Option E would involve a minor realignment of the proposed Line 406 route. This would position the route to follow CR-19, east of CR-87. At CR-19A, it would extend back to the north via an existing dirt road and underneath a large electrical transmission corridor. This route alternative would then cross an irrigation lateral and continue north where it would converge back with the proposed Line 406 route, just west of I-505. This alternative would then follow the same route as the proposed Project east of I-505. This option would increase slightly the total length of the pipeline. Figure 3-2D shows Option E.

Required Agency Approvals

The required agency permits and approvals for Option E would be similar to those for the proposed Project.

Reason for Consideration

This route alternative would meet all of the basic Project objectives and would reduce segmenting agricultural fields in the Hungry Hollow area. However, this alternative would require locating the Project closer to several residences situated along CR-19.

Option F

Option F would follow the proposed alignment for Line 406 from Lines 400 and 401 to the eastern end of the Dunnigan Hills, where it would turn north off CR-17 approximately 5,000 feet west of CR-95A. This alternative would not alter the length of the segment, but would turn north to align with the I-5 crossing further east than the proposed alignment. Figure 3-2E shows Option F.

Required Agency Approvals

The required agency permits and approvals for Option F would be similar to those for the proposed Project.

Reason for Consideration

This route alternative would meet all of the basic Project objectives and would avoid more difficult trenching through hilly terrain.

Option G

Option G would be located at the western end of Line 407 West, just east of the Yolo Junction Station and existing Line 172A. This alternative leaves the proposed Yolo Junction Station and aligns with an unnamed farm road, which it follows along a field edge until the intersection of CR-16A and CR-98. Figure 3-2F shows Option G.

Required Agency Approvals

The required agency permits and approvals for Option G would be similar to those for the proposed Project.

Reason for Consideration

This route alternative would meet all of the basic Project objectives and would reduce segmenting an agricultural field. However, this alternative would move the pipeline closer to two residences on CR-16A.

Option H

Near the western levee of the Yolo Bypass, Option H would head southeast through agricultural fields within the Yolo Bypass to a point on the Sacramento River directly across from West Elverta Road. It would then cross the Sacramento River and parallel West Elverta Road to Powerline Road. The route would head north paralleling Powerline Road to Riego Road and would then parallel Riego Road through the Natomas Basin Conservancy to Steelhead Creek. The route would parallel the northern border of the Placer Vineyards Specific Plan area along Baseline Road (Riego Road becomes Baseline Road in Placer County) until the tie-in with Line 123 at the intersection of Baseline Road and Fiddyment Road. Figure 3-2G shows Option H.

Required Agency Approvals

The required agency permits and approvals for Option H would be similar to those for the proposed Project.

Reason for Consideration

This route alternative would meet all of the basic Project objectives, would result in a more direct route to the DFM, and would reduce impacts to agricultural lands along a portion of CR-16 and Riego Road. However, this alternative would involve a greater distance of cross-county trenching through the Yolo Bypass.

Option I

Option I would follow the proposed alignment for Line 407-E along Base Line Road to South Brewer Road, where the pipeline would extend north along the west side of South Brewer Road, crossing one seasonal wetland, to a point approximately 1,500 feet north of the intersection of Base Line Road and South Brewer Road. This alternative would then extend east for approximately 1.0 mile through agricultural land, crossing Steelhead Creek and two seasonal wetlands before reaching Country Acres Lane. From this point, this alternative would turn south and travel through pasture/fallow agricultural fields along the east side of Country Acres Lane, crossing seasonal wetlands. At the intersection with Base Line Road, the pipeline would join and follow the remainder of the proposed alignment for Line 407-E along Base Line Road. This option would increase slightly the total length of the pipeline. Figure 3.2H shows Option I.

Required Agency Approvals

The required agency permits and approvals for Option I would be similar to those for the proposed Project.

Reason for Consideration

This route alternative was considered in order to place the pipeline outside of a 1,500-foot safety buffer zone around a planned high school (PG&E 2009; Appendix C-1). This route alternative would meet all of the basic Project objectives and would increase the distance of the pipeline from a planned high school along Base Line Road.

Option J

Option J would follow the proposed alignment for Line 407-E along Base Line Road to South Brewer Road, where the pipeline would extend north along the west side of South Brewer Road, crossing one seasonal wetland, a vernal pool, and Steelhead Creek, to a point approximately 2,600 feet north of the intersection of Base Line Road and South Brewer Road. This alternative would then extend approximately 0.5 mile east through agricultural land and seasonal wetlands before turning south for approximately 0.1 mile. This alternative would then turn east again and extend approximately 0.5 mile along the edge of a rice field to Country Acres Lane. From this point, this alternative would turn south and travel through pasture/fallow agricultural fields along the east side of Country Acres Lane, crossing a seasonal swale and seasonal wetlands. At the intersection with Base Line Road, the pipeline would join and follow the remainder of the proposed alignment for Line 407-E along Base Line Road. This option would increase slightly the total length of the pipeline. Figure 3.2I shows Option J.

Required Agency Approvals

The required agency permits and approvals for Option J would be similar to those for the proposed Project.

Reason for Consideration

This route alternative was considered in order to place the pipeline outside of a 1,500-foot safety buffer zone around a planned high school (PG&E 2009; Appendix C-1). This route alternative would meet all of the basic Project objectives and would increase the distance of the pipeline from a planned high school along Base Line Road.

Option K

Option K would follow the proposed alignment for Line 407-E along Base Line Road to a location approximately 3,300 feet east of Country Acres Lane. This alternative would then extend northeast, at an angle, to a point approximately 150 feet north of Base Line Road. The pipeline would then turn and extend directly east for approximately 0.2 mile, and then would turn southeast and extend, at an angle, back to Base Line Road. The pipeline would then join and follow the remainder of the proposed alignment for Line 407-E along Base Line Road. This alternative would cross a vernal pool and seasonal wetlands, and would require the redesign or relocation of the proposed HDD at this location in order to construct this alternative alignment. Figure 3.2-J shows Option K.

Required Agency Approvals

The required agency permits and approvals for Option K would be similar to those for the proposed Project.

Reason for Consideration

This route alternative was considered in order to place the pipeline outside of a 1,500-foot safety buffer zone around a planned elementary school (see Appendix C-1 and Appendix C-2). This route alternative would meet all of the basic Project objectives and would increase the distance of the pipeline from a planned elementary school south of Base Line Road. However, this route alternative complicates the currently planned HDD that was proposed to avoid an environmental feature. The HDD would need to be shortened or relocated to intercept the alternative alignment on the western boundary of the buffer zone. Potential impacts to regulated wetlands, vernal pools, and giant garter snake habitat features would increase under Option K.

Option L

Option L would follow the proposed alignment for Line 407-E along Base Line Road, but would extend the proposed HDD approximately 1,345 feet to the east.

This alternative would increase the depth of cover through the buffer zone to approximately 35 feet and reduce the risk potential to a planned elementary school south of Base Line Road. Figure 3.2-K shows Option L.

Option L would include the following PG&E Applicant Proposed Measure:

APM ALT-L PG&E would partner with the Center Unified School District to jointly develop a risk analysis in accordance with section 14010(h) of Title 5 of the California Code of Regulations regarding the location of a school site within 1,500 feet of a pipeline. The risk analysis would include a quantitative risk assessment to evaluate potential pipeline impacts to the school. If the assessment determines that there is a risk of serious injury or fatality presented by the pipeline, corrective measures would be recommended to reduce the probability and/or consequence such that the risk is reduced to an acceptable level per the above mentioned regulation.

Required Agency Approvals

The required agency permits and approvals for Option L would be similar to those for the proposed Project.

Reason for Consideration

This route alternative would meet all of the basic Project objectives. The added cover through the buffer zone is designed to reduce the risk potential to the school given that the pipeline is very close to the edge of the 1,500-foot buffer zone (PG&E 2009, Appendix C-1).

3.4 COMPARISON OF PROPOSED PROJECT AND ALTERNATIVES

The CEQA Guidelines (section 15126.6 (d)) requires that an EIR include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed Project. The CEQA Guidelines (section 15126.6 (e)(2)) further state, in part, that "If the environmentally superior alternative is the "No Project" alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives." The environmentally superior alternative discussion is provided in the Executive Summary.

A matrix displaying the major characteristics and significant environmental effects of each alternative may be used to facilitate this comparison. Table ES-2 in the Executive Summary provides a comparison of the proposed Project with each of the alternatives evaluated in Section 4.0, Environmental Analysis, including the No Project Alternative.

Initial general comparisons of route alternatives and variations determined that the northernmost routes for Line 406 and Line 407 from existing Lines 400 and 401 in Yolo County to existing Line 123 in Placer County would result in greater construction and natural resource impacts. These northernmost alternatives were eliminated from further consideration after initial evaluations of northern, central, and southern alternatives for Line 406 and Line 407. The remaining alternatives and a number of variations were evaluated in more detail and the most favorable alternative variations became alternatives for consideration in this EIR. The selected alternatives would accomplish the Project objectives of serving new growth areas within the region and providing greater capacity and service reliability to the existing natural gas transmission and distribution pipeline system in California's Central Valley.

3.5 CUMULATIVE RELATED FUTURE PROJECTS

This discussion provides a listing and map identifying other related future projects near the location of the proposed Project and Alternatives.

Section 15130 of the CEQA Guidelines requires that an EIR discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable, as defined in section 15065(c). Where a lead agency is examining a project with an incremental effect that is not "cumulatively considerable," a lead agency need not consider that effect significant, but shall briefly describe its basis for concluding that the incremental effect is not cumulatively considerable. As defined in section 15355 of the CEQA Guidelines, a cumulative impact consists of an impact, which is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts. An EIR should not discuss impacts which do not result in part from the project evaluated in the EIR.

In this context, the main physical environmental impacts associated with the Project would be associated with construction and initial pipeline testing. Once operational, and beyond routine maintenance, the pipeline would be buried and subject to impact from outside forces. Outside forces include impact by mechanical equipment, such as bulldozers and backhoes; earth movements due to soil settlement, washouts, or geological hazards; weather effects, such as winds, storms, and thermal strains; and willful damage. With this reasoning, the analysis of cumulative impacts focuses on other construction-related projects that would occur within the cumulative study area defined in Figure 3-3.

Construction projects considered as part of the cumulative analysis are expected to occur during the same time as the Project. As provided in Section 2.0, Project Description, construction of Line 406 would begin in Summer or Fall 2009 with construction of the remaining pipeline segments continuing through 2012. Project operation would then continue for its 50-year design life expectancy.

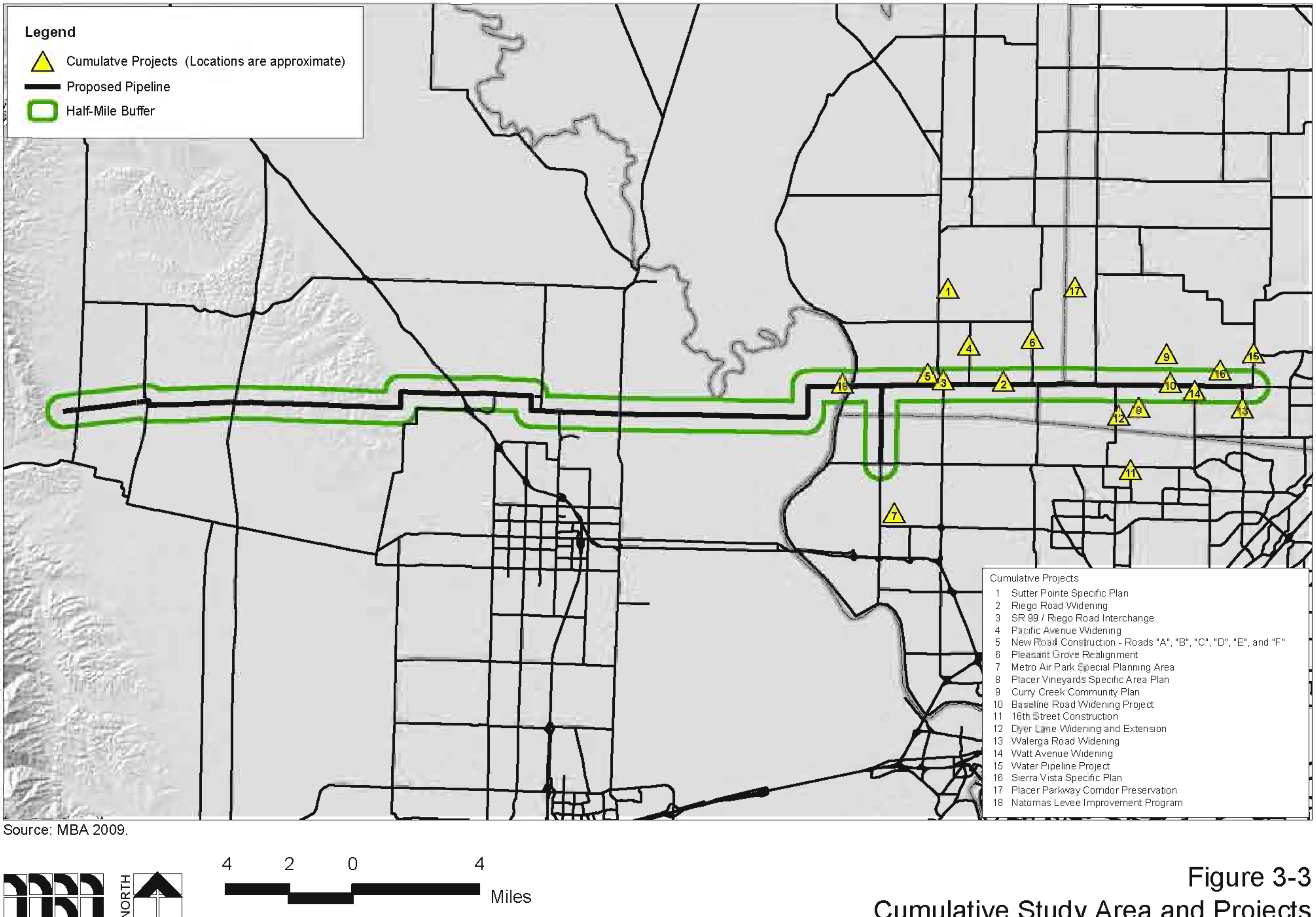
3.5.1 Boundary of Cumulative Projects Study Area

The Cumulative Projects Study Area is the area within 0.5 mile of the proposed Project alignment, as shown in Figure 3-3. The proposed Project’s localized environmental impacts could combine with the impacts of other projects within the defined area and be cumulatively considerable. This Study Area may vary slightly depending on individual resources as analyzed in Section 4.1 through 4.14. For instance, air quality impacts are more appropriately analyzed at the regional level based on air districts and air basins.

3.5.2 Description of Cumulative Projects

Potentially cumulative projects considered in this analysis are those within the defined Cumulative Projects Study Area in Yolo County, Sutter County, Sacramento County, Placer County, and the City of Roseville (presented in geographical order from west to east) that are expected to be under construction during the Project’s construction.

Cumulative projects considered in this analysis are either proposed or already approved, and all would be expected to have potential cumulative impacts in relation to the proposed Project based on their proximity to the Project and their potential impacts with regard to air quality, biological resources, noise, and traffic among others. Table 3-3, on the following page, lists the projects considered in this analysis while Figure 3-3 identifies the location of the projects. Each cumulative project listed in the table corresponds with a numeric identifier as shown in Figure 3-3.



Source: MBA 2009.

Michael Brandman Associates

Figure 3-3
Cumulative Study Area and Projects

Table 3-3: Cumulative Impact Analysis Projects

County/City	Project Number/Name[1]	Sub-Project Number/Name[1]	Description	Potential Cumulative Impacts Related to the Proposed Project
Yolo County	No projects identified within the Cumulative Projects Study.	—	—	—
Sutter County	1. Sutter Pointe Specific Plan (SPSP) (Measure M)	—	The SPSP was developed in response to approved Measure M, which contained requirements for strategic planning for the region. It is a mixed-use development on approximately 7,500 acres in southeastern Sutter County incorporating industrial, commercial, residential, open space, and civic land uses. The SPSP is located at the intersection of Riego Road and SR-99 and encompasses land generally bounded by the Sacramento/Sutter County line to the south, Natomas Road on the east, SR-99 along most of the western side (Powerline Road at the westernmost edge), and extends approximately 4 miles north of the Sutter - Sacramento County line. Several school sites are proposed within the SPSP Area; however, only one is within 1,000 to 1,500 feet of the proposed pipeline. Development of the SPSP includes off-site improvements, such as widening of Riego Road (discussed below) and construction of an approximately 6.1 mile-long sewer interceptor line. A Draft EIR has been prepared for the SPSP and the County of Sutter is processing the Project's applications. The SPSP is expected to be constructed over approximately 30 years, with the start of construction occurring in 2009.	Agriculture, Air Quality, Biology, Cultural, Geology, Hazards, Noise, Traffic, Water Resources
Sutter County		2. Riego Road Widening	Riego Road is scheduled to be widened in phases between 2009 and 2010. The first section of widening, from SR-99 to Placer County, is expected to occur in 2009. This first section would widen Riego Road to 4 or 6 lanes. The following Riego Road improvements are expected to be completed in 2009 or 2010: • From SR-99 to Power Line Road - widen to 4 lanes • From SR-99 to Pacific Avenue - widen to 6 lanes	Agriculture, Air Quality, Biology, Cultural, Hazards, Noise, Traffic

County/City	Project Number/Name[1]	Sub-Project Number/Name[1]	Description	Potential Cumulative Impacts Related to the Proposed Project
			• From Pacific Avenue to Road F - widen to 6 lanes • From Road F to Pleasant Grove Road - widen to 6 lanes and include grade separation at railroad crossing • From SR-99 to 2 miles westward - widen to 4 lanes	
Sutter County		3. SR-99/Riego Road Interchange	The SR-99/Riego Road interchange will be improved in 2009. The improvements include construction of a new 5-lane interchange.	Agriculture, Air Quality, Biology, Cultural, Hazards, Noise, Traffic
Sutter County		4. Pacific Avenue Widening	Pacific Avenue will be widened from 2 to 4 lanes from Sankey Road to Riego Road. Construction is expected to begin in 2012.	Agriculture, Air Quality, Biology, Cultural, Hazards, Noise, Traffic
Sutter County		5. New Road Construction - Road “A”, “B”, “C”, “D”, “E”, and “F”	Several new roads will be constructed adjacent to and south of Riego Road as part of the SPSP development. At the time of this EIR’s preparation, the road sections have not been named, and are referred to as Roads “A” through “F”; all are expected to be constructed in 2010. • **Road A.** New 4-lane road 1 mile west of SR-99 from Riego Road to 0.5 mile south. • **Road B.** New 4-lane road 0.5 mile west of SR-99, from Riego Road to 0.5 mile south. • **Road C.** New 4-lane road 0.5 mile south of Riego Road, from Road A to Road B. • **Road D.** New 4-lane road 0.5 mile east of SR-99, from Riego Road to 0.5 mile south. • **Road E.** New-4 lane road 0.5 mile south of Riego Road between Road D and Road F. • **Road F.** New 4-lane road 1 mile east of Pacific Avenue from Riego Road to Road E.	Aesthetics, Agriculture, Air Quality, Biology, Cultural, Geology, Hazards, Noise, Traffic, Water Resources
		6. Pleasant Grove Realignment	Located just east of the SPSP, Pleasant Grove Road runs perpendicular to Riego Road. Pleasant Grove Road is scheduled to be widened to 4 lanes between Howsley Road to Riego Road in 2010.	Agriculture, Air Quality, Biology, Cultural, Hazards, Noise, Traffic

County/City	Project Number/Name[1]	Sub-Project Number/Name[1]	Description	Potential Cumulative Impacts Related to the Proposed Project
Sacramento County	7. Metro Air Park Special Planning Area (Metro Air Park)	—	The Metro Air Park is a multi-district industrial park encompassing approximately 1,800 acres east of Sacramento International Airport. The Metro Air Park area is bounded by Powerline Road to the west, Elverta Road to the north, Lone Tree Road to the west, and I-5 to the south. Development within the Metro Air Park is regulated by the Sacramento County Zoning Code, which contains the Metro Air Park Special Planning Area Ordinance.	**TBD.**
Placer County	8. Placer Vineyards Specific Area Plan (PVSP)	—	The PVSP is a mixed-use plan encompassing approximately 5,230 acres in the southwest corner of Placer County. The PVSP is generally bounded by the Sacramento/Placer County line to the south, Dry Creek along the eastern edge, Baseline Road on the north, and the railroad to the west. CEQA requirements have been fulfilled for the PVSP. However, the pending requested entitlements include approval of the PVSP, rezoning, development agreements, and other actions. Several schools are proposed within the PVSP Area, of which two would be located within 1,500 feet of the proposed pipeline. Impacts to proposed schools are discussed in Sections 4.7, Hazards and Hazardous Materials; 4.9, Land Use and Planning; 4.10, Noise; 4.12, Population and Housing/Public Services/Utilities; and 4.13, Transportation and Traffic of this Draft EIR. The construction of PVSP is expected to occur over 30 years, starting in 2008.	Aesthetics, Agriculture, Air Quality, Biology, Cultural, Geology, Hazards, Noise, Traffic, Water Resources
Placer County	9. Curry Creek Community Plan		The Curry Creek Community Plan is a mixed-use plan in Placer County. The plan covers 2,828 acres north of Base Line Road, north of the Placer Vineyards Specific Plan and west of the West Roseville Specific Plan.	Aesthetics, Agriculture, Air Quality, Biology, Cultural, Geology, Hazards, Noise, Traffic, Water Resources

County/City	Project Number/Name[1]	Sub-Project Number/Name[1]	Description	Potential Cumulative Impacts Related to the Proposed Project
Placer County	Roadway Improvements Related to Placer Vineyards Specific Area Plan	10. Baseline Road Widening Project	Baseline Road will first be widened to 4 lanes near the PVSP, and will ultimately be expanded to 6 lanes (expected by 2015). Road improvements will occur in sections. First, Baseline Road will be widened from Fiddyment Road to Watt Avenue by 2009. Baseline Road from Watt Avenue to the Sutter/Placer County line is expected to be widened to 4 lanes by 2009.	Agriculture, Air Quality, Biology, Cultural, Hazards, Noise, Traffic
Placer County		10. 16th Street Construction	Currently, 16th Street is located in Sacramento County and ends at the Sacramento/Placer County Line. The 16th Street extension will be constructed between the end of 16th Street in Sacramento County and Baseline Road in Placer County. Construction is expected to be completed by 2009.	Agriculture, Air Quality, Biology, Cultural, Hazards, Noise, Traffic
Placer County		12. Dyer Lane Widening and Extension	Dyer Lane, a 1-mile long road located south of Baseline Road and east of Watt Avenue, will be extended west and east. Both the west and east extensions will curve Dyer Lane north to Baseline Road. The east extension will intersect Baseline Road west of the Baseline/Fiddyment Road intersection. Dyer Lane will be widened to 4 lanes in accordance with the Placer Vineyards Specific Plan. Construction is expected to be completed by 2009.	Agriculture, Air Quality, Biology, Cultural, Hazards, Noise, Traffic
Placer County		13. Walerga Road Widening	Walerga Road will be realigned from Baseline Road to the Sacramento/Placer County boundary. In addition, Walerga Road will be widened from 2 to 4 lanes, with construction completed by 2009.	Agriculture, Air Quality, Biology, Cultural, Hazards, Noise, Traffic
Placer County		14. Watt Avenue Widening	Watt Avenue will be widened to 4 lanes from Baseline Road to the Sacramento/Placer County boundary by 2009.	Agriculture, Air Quality, Biology, Cultural, Hazards, Noise, Traffic
Placer County		15. Water Pipeline Project	This project provides funding for the relocation of an existing 24-inch pipeline crossing Highway 65 that presently supplies water to the Sunset Industrial area. Placer County is proposing a new interchange and the existing pipeline may be in conflict with the proposed improvements.	Agriculture, Air Quality, Biology, Cultural, Geology, Hazards, Noise, Traffic

County/City	Project Number/Name[1]	Sub-Project Number/Name[1]	Description	Potential Cumulative Impacts Related to the Proposed Project
City of Roseville	16. Sierra Vista Specific Plan		The Sierra Vista Specific Plan (SVSP) is located on the southwest boundary of the City of Roseville, and would include multiple approvals: • Annexation No. ANN-000002; • Sphere of Influence Amendment No. SPA-000024; • General Plan Amendment No. GPA-000034; • Rezone No. RZ-000037; • No. DA-000029. The SVSP encompasses approximately 2,178 acres and is roughly bounded by Baseline Road to the south and Fiddyment Road to the east. Development of the SVSP would include residential, commercial, office, open space, and public/quasi-public land uses. Several school sites are proposed within the SVSP; however, none of these is located within 1,500 feet of the proposed pipeline. Construction of the SVSP is expected to start in 2008.	Aesthetics, Agriculture, Air Quality, Biology, Cultural, Geology, Hazards, Noise, Traffic, Water Resources
Multi-County Projects	17. Placer Parkway Corridor Preservation (Placer Parkway)		The DEIR/DEIS for Placer Parkway was released in June of 2007. The EIR/EIS contained five project alternatives, one of which (Alternative 1) would include roadway improvements to the West Riego Road/SR-99 interchange. Construction is planned for 2009.	Agriculture, Air Quality, Biology, Cultural, Hazards, Noise, Traffic
Multi-County Projects	18. Natomas Levee Improvement Plan (NLIP)		The NLIP has been developed to reduce the risk of flood in the Natomas Basin. In addition to other activities, the NLIP includes raising, reinforcing, and reshaping existing levees on the east side of the Sacramento River between the City of Sacramento and the Howsley Road/SR-99 interchange. Levee work will occur on the east side of the Sacramento River near Baseline Road starting in 2008.	Aesthetics, Agriculture, Air Quality, Biology, Cultural, Geology, Hazards, Noise, Traffic, Water Resources

[1] Project number corresponds to numbering on Figure 3-3.
Source: PG&E.

3.5.3 Description of Cumulative Environment

Cumulative environmental impacts associated with the proposed Project and those projects listed in Table 3-2 are analyzed separately for each resource area in Section 4.0, Environmental Analysis. Those sections consider construction and operational impacts associated with the proposed Project with respect to other planned or recently completed projects in the area, as well as existing conditions in the area.

Section 15130 of the CEQA Guidelines states that lead agencies should define the geographic scope for the resource area affected and provide a reasonable explanation for the geographic scope used in the analysis. With respect to cumulative impacts, the geographic scope of potential cumulative impacts is somewhat defined by the resource area being analyzed. For example, the geographic scope for the air quality cumulative impact analysis is typically the project's Air Basin, while the geographic scope defined for other resource areas, such as aesthetics, biological resources, or noise, is more localized.

Provided below are brief descriptions of the cumulative environment for those resource areas having the greatest potential for cumulative impacts. More detailed descriptions of the environmental setting for each resource area are provided in Section 4.0, Environmental Analysis.

Agricultural Resources

The cumulative environment for agricultural resources when considering conversion of prime agricultural land, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use is the permanent impact area of the proposed Project. This is also the cumulative environment when considering conflict with existing land use plans, policies, or regulations for agricultural use or a Williamson Act contract. When considering other changes in the existing environment that, due to their location or nature, could result in permanent loss of farmland or conversion of farmland to non-agricultural use, the cumulative environment for agricultural resources would be Sacramento, Yolo, Sutter, and Placer counties.

Air Quality

The air quality cumulative environment is the southern Sacramento Valley, which is under the jurisdiction of the Sacramento Metropolitan Air Quality Management District (SMAQMD), Yolo-Solano Air Quality Management District (YSAQMD), Feather River Air Quality Management District (FRAQMD), and the Placer County Air Pollution Control District (PCAPCD). The U.S. Environmental Protection Agency (EPA) has designated Sacramento, Yolo, Sutter, and Placer counties as non-attainment areas for the Federal 8-hour ozone standard. The counties are also in nonattainment of the State 1-hour and 8-hour ozone standards. Through control measures adopted by Federal, State, and local agencies, each of the four counties have attained the Federal and State carbon monoxide (CO) standards. However, the potential still exists for incidents of high localized concentrations of CO. Sacramento, Placer, Yolo, and Sutter counties are in nonattainment of the Federal particulate matter (PM_{10}) standards, the more stringent State PM_{10} standards, and the state annual $PM_{2.5}$ standard. These criteria air pollutants are discussed in greater detail in Section 4.6, Air Quality.

Under Assembly Bill (AB) 32, California's Global Warming Solutions Act, the California Air Resources Board (CARB) is required to adopt, by January 1, 2008, a statewide greenhouse gas (GHG) emissions limit equivalent to the statewide greenhouse gas emissions levels in 1990, which must be achieved by 2020. By January 1, 2011, the CARB is required to adopt rules and regulations that shall become operative January 1, 2012, to achieve the maximum technologically feasible and cost-effective GHG emission reductions. AB 32 also requires the CARB to monitor compliance with and enforce any rule, regulation, order, emission limitation, emissions reduction measure, or market-based compliance mechanism that it adopts. The SMAQMD, YSAQMD, FRAQMD, and PCAPCD currently do not provide any guidance on assessing the cumulative environment relative to GHG emissions. Senate Bill (SB) 97, signed in August 2007, requires analysis under CEQA. This bill directs the State Office of Planning and Research (OPR) to develop and provide to the Resources Agency guidelines for feasible mitigation of GHG emissions or the effects of GHG emissions by July 1, 2009. The Resources Agency is required to certify or adopt the guidelines by January 1, 2010.

Biological Resources

The cumulative environment for biological resources includes Sacramento, Yolo, Sutter, and Placer counties. Habitats affected by the proposed Project and other cumulative projects include: agricultural lands, annual grassland, ruderal communities, and wetland communities including vernal pools, seasonal wetlands, freshwater emergent marsh, irrigation ditches, riparian woodland and riverine communities. These habitats provide suitable habitat for special status plants and wildlife.

Cultural and Paleontological Resources

The cumulative environment for cultural resources considers a broad cultural and regional system of which the local resources are a part. The cumulative context for the cultural resource analysis for the proposed Project includes Sacramento, Yolo, Sutter, and Placer Counties. Development in these counties is assumed to include thousands of acres of land.

The cumulative environment for paleontological resources considers a broad regional system of which the local resources are a part. The significance of cumulative impacts to paleontological resources is determined by the nature of the impacts and the significance of the fossils. The cumulative context for the paleontological resources analysis for the proposed Project includes Sacramento, Yolo, Sutter, and Placer counties. Development in these counties is assumed to include thousands of acres of land.

Geology and Soils

The cumulative environment for geology and soils consists of relatively flat, level topography along major transportation routes and in areas with agricultural land uses and conservation land. Existing grades from road and railroad structures extend above the level agricultural fields. With the exception of the Dunnigan Hills, geologic maps for the cumulative environment indicate that the Project is generally underlain by Quaternary alluvial deposits consisting of channel and basin deposits (DWR 2004). Additionally, human made levees have been constructed for flood control purposes in the proposed Project vicinity. The cumulative environment lies within Seismic Zone 3, per the 2000 California Building Code, and is not located within an Alquist-Priolo Earthquake Fault Zone (CBCS 2001).

The geographic context for the analysis of impacts resulting from geologic hazards generally is site-specific, rather than cumulative in nature, because each project site has a different set of geologic considerations that would be subject to uniform site development and construction standards.

Hazards and Hazardous Materials

The cumulative context for hazards and hazardous materials use would be Sacramento, Yolo, Sutter, and Placer counties. Pursuant to Government Code section 65962.5, a database search was conducted in order to identify known areas containing hazardous materials within the proposed Project area. A review of these databases identified sites that are within a 1-mile wide corridor centered on the Project. In addition, a risk analysis was completed that identified hazards associated with risk of serious injury or fatality from and unintentional rupture or leak of natural gas from the pipeline in populated areas.

Noise

The proposed Project would be constructed primarily through rural agricultural areas. The eastern extent of the Project includes several large planned developments with residential subdivisions recently constructed in the City of Roseville. Sensitive noise receptors within the cumulative environment include rural residences, residential, and planned residential subdivisions, and schools.

Traffic and Transportation

The access routes to be used during construction of the proposed Project consist of an interstate freeway, a State highway, a county highway, local county-maintained roads, and private roads. The following roadways are identified as access routes to the proposed Project alignment: County Roads (CRs) 13, 14, 16, 17, 19, 85, and 87, SR-119 and SR-99/70, I-5 and I-505, Elverta Road, Baseline Road, and Lambert Road. In addition to these roads, the cumulative environment would also include the following: CRs 95, 102, E11, Sorento Road, Fiddyment Road, Locust Road, and Main Street.

Water Resources

The cumulative environment for water resources includes the Sacramento River Hydrologic Region, which covers approximately 17.4 million acres (27,200 square miles). Major water crossings for the Project include the Sacramento River and several tributaries. The Project is situated at the southern end of the Sacramento Valley Groundwater Basin with the primary water bearing formations comprised of sedimentary continental deposits of Late Tertiary (Pliocene) to Quaternary (Holocene) age.

From a water quality perspective, the Sacramento River (from Knights Landing to the Sacramento-San Joaquin Delta [Delta]) is identified in the 2006 California Section 303(d) List and total maximum daily load (TMDL) Priority Schedule as an impaired water body for the following contaminants: mercury and unknown toxicity (RWQCB 2006). The northern portion of the Delta downstream of the Project area has been designated as impaired for a variety of contaminants, including pesticides (chlorpyrifos, dichloro-diphenyl-trichloro-ethane [DDT], diazinon, and Group A pesticides) resulting from agricultural and urban runoff/storm sewers, mercury (from abandoned mine drainage), polychlorinated biphenyls (PCBs), exotic species, and unknown toxicity (unknown cause) (RWQCB 2006).

4.0 ENVIRONMENTAL ANALYSIS

INTRODUCTION TO ENVIRONMENTAL ANALYSIS

Section 4.0 examines the potential environmental impacts of the proposed Project and Project Alternatives. This Section includes analyses of the environmental issue areas listed below:

- 4.1 Aesthetic/Visual Resources;
- 4.2 Agricultural Resources;
- 4.3 Air Quality;
- 4.4 Biological Resources;
- 4.5 Cultural Resources;
- 4.6 Geology and Soils;
- 4.7 Hazards and Hazardous Materials;
- 4.8 Hydrology and Water Quality;
- 4.9 Land Use and Planning;
- 4.10 Noise;
- 4.11 Recreation;
- 4.12 Population and Housing/Public Services/Utilities and Service Systems;
- 4.13 Transportation and Traffic; and
- 4.14 Energy and Mineral Resources.

Each environmental issue area analyzed in this document provides background information and describes the environmental setting (baseline conditions) to help the reader understand the conditions that would cause an impact to occur. In addition, each section describes how an impact is determined to be "significant" or "less than significant." Finally, the individual sections recommend mitigation measures (MMs) to reduce significant impacts. Throughout this Section's environmental sub-sections, both impacts and the corresponding MMs are identified by a bold **letter-number designation** (e.g., Impact **LU-1** and **MM LU-1a**).

ASSESSMENT METHODOLOGY

Environmental Baseline

The analysis of each issue area begins with an examination of the existing physical setting (baseline conditions as determined pursuant to section 15125(a) of the CEQA Guidelines) that may be affected by the proposed Project. The effects of the proposed Project are defined as changes to the environmental setting that are attributable to Project components or operation.

Significance Criteria

Significance criteria are identified for each environmental issue area. The significance criteria serve as benchmarks for determining if a component action will result in a significant adverse environmental impact when evaluated against the baseline. According to the CEQA Guidelines section 15382, a significant effect on the environment means "…a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project…"

Impact Analysis

Impacts are classified as:

- **Class I** (significant adverse impact that remains significant after mitigation);
- **Class II** (significant adverse impact that can be eliminated or reduced below an issue's significance criteria);
- **Class III** (adverse impact that does not meet or exceed an issue's significance criteria); or
- **Class IV** (beneficial impact).

A determination will be made, based on the analysis of any impact within each affected environmental issue area and compliance with any recommended mitigation measure(s), of the level of impact remaining in comparison to the pertinent significance criteria. If the impact remains significant, at or above the significance criteria, it is deemed to be Class I. If a "significant adverse impact" is reduced, based on compliance with mitigation, to a level below the pertinent significance criteria, it is determined to no longer have a significant effect on the environment, i.e., to be "less than significant" (Class II). If an action creates an adverse impact above the baseline condition, but such impact does not meet or exceed the pertinent significance criteria, it is determined to be adverse, but less than significant (Class III). An action that provides an improvement to an environmental issue area in comparison to the baseline information is recognized as a beneficial impact (Class IV).

Formulation of Mitigation Measures and Mitigation Monitoring Program

When significant impacts are identified, feasible mitigation measures are formulated to eliminate or reduce the intensity of the impacts and focus on the protection of sensitive resources. The effectiveness of a mitigation measure is subsequently determined by evaluating the impact remaining after its application. Those impacts meeting or exceeding the impact significance criteria after mitigation are considered residual impacts that remain significant (Class I). Implementation of more than one mitigation measure may be needed to reduce an impact below a level of significance. The mitigation measures recommended in this document are identified in the environmental analysis for each issue area and presented in Section 6.0, Mitigation Monitoring Program (MMP).

If any mitigation measure becomes incorporated as part of a project's design, it would no longer be considered a mitigation measure under the CEQA. If mitigation measures eliminate or reduce a potentially significant impact to a level below the significance criteria, they eliminate the potential for that significant impact since the "measure" is now a component of the action. Such measures incorporated into the project design have the same status as any "Applicant Proposed Measures." The California State Lands Commission's (CSLC's) practice is to include all measures to eliminate or reduce the environmental impacts of a proposed project, whether applicant proposed or recommended mitigation, in the MMP.

Impacts of Alternatives

Section 3.0, Alternatives and Cumulative Projects, provides a list, description, and map identifying alternatives to the proposed Project. Each issue area in this Section presents the impact analysis for each alternative scenario. A summary of the collective impacts of each alternative in comparison with the impacts of the proposed Project is included within the Executive Summary.

Cumulative Projects Impact Analysis

Each issue area in this Section presents the cumulative impact scenario, the focus of which is to identify the potential impacts of the Project that might not be significant when considered alone, but that might contribute to a significant impact when viewed in conjunction with the other projects.

4.1 AESTHETIC/VISUAL RESOURCES

This Section describes the existing visual resources in the Project area and assesses the visual impacts that could potentially occur as a result of the Project's construction and operation. Visual or aesthetic resources are generally defined as both the natural and built features of the landscape that contribute to the public's experience and appreciation of the environment. Depending on the extent to which a Project's presence will alter the perceived visual character and quality of the environment, visual or aesthetic impacts may occur. Descriptions and analysis in this Section are based on the review of proposed Project maps, site visits, photographs of the Project area, and the review of appropriate planning documents.

4.1.1 Environmental Setting

The proposed 40-mile long pipeline lies in the Central Valley of California and traverses in an east to west direction through unincorporated, predominately agricultural areas of Yolo, Sutter, Sacramento, and Placer counties. The Project area ranges in elevation from approximately 15 to 255 feet, and consists of a relatively flat topography with the exception of the rolling hill topography of the Dunnigan Hills area in Yolo County.

The proposed alignment of the pipeline parallels existing county and farm roads to the maximum extent feasible; however, some portions will cross through agricultural lands containing crops. Views of the entire Project area consist mostly of agricultural lands, fields, and orchards as well as occasional trees, houses and farming-related structures and implements. Immediate views of the Project area west of the Sacramento River, near Line 406 and 407 West, consist mainly of row crops, irrigated pasture, orchards, and grazing lands. Additionally, the pipeline would cross under three large electrical transmission lines. Project areas near the east end of the pipeline are currently experiencing rapid urban development and population growth. This area currently consists of rice fields, non-native annual grasslands and seasonal and vernal pool wetlands. Commercial and residential developments are planned in the areas surrounding Line 407 East and the Powerline Road Distribution Feeder Main (DFM) and are located in Placer, Sutter, and Sacramento counties. The Project's eastern termination point is located at the northwestern corner of Baseline Road and Fiddyment Road. Residential developments have recently been built on properties to the northeast, southeast and southwest of the same intersection. While the project is located within the City of

Roseville's sphere of influence, the adjacent developments are located within the city limits.

Hydrology features in much of the Project area have been significantly modified for agricultural uses. Existing water features mainly consist of irrigation canals, ditches, and intermittent creeks. Two large water features, the Sacramento River and the Knights Landing Ridge Cut, bisect the Project area. The Sacramento River runs in an approximate northwest to southeast direction and forms the border between eastern Yolo County and western Sutter and Sacramento counties. The river is approximately 400 to 450 feet wide in the Project area. The Knights Landing Ridge Cut, approximately 5 miles west of the Sacramento River, also runs in a northwest to southeast direction. Neither the Sacramento River nor the Knights Landing Ridge Cut can be seen from the Project area except along the tops of the levees that separate them from the surrounding agricultural lands.

The proposed pipeline would travel through the Yolo Bypass Wildlife Area, Sacramento River Ranch Conservation Bank, and the Huffman East, Huffman West, Vestal, and Atkinson tracts of the Natomas Basin Habitat Conservation Plan Area. Viewsheds within these areas contain rice fields, row crops, wetlands, and a small area of oak woodlands.

Views surrounding the Project area include the Mayacamas Mountain Range, (part of the Coast Range), which runs in a north-south direction in western Yolo County. To the east the Sierra Nevada Mountain range, which also runs in a north-south direction, can be seen in the distance from Project areas east of the Dunnigan Hills. Additionally, the Sutter Buttes, a circular mountainous region of approximately 75 square miles, can be seen to the north from portions of the pipeline on a clear day.

Scenic Routes

There are no State designated scenic highways within the Project viewshed (Caltrans 2008). However, the Yolo County General Plan identifies County Roads (CR) 116, 16, and 117 as scenic routes and together they are identified as the Sacramento Northern River Scenic Route.

Additionally, Sacramento County's General Plan designates Garden Highway, which runs along the crown of the Sacramento River's eastern levee from the Sacramento city limits north to the Sutter County line, as a protected scenic corridor.

4.1.2 Regulatory Setting

Federal

There are no Federal regulations related to aesthetics that are relevant to the Project.

State

California Department of Transportation

The California Scenic Highway Program is intended to preserve and protect scenic highway corridors from change that would diminish the aesthetic value of lands adjacent to highways. A highway may be designated scenic depending upon how much of the natural landscape can be seen by travelers, the scenic quality of the landscape, and the extent to which development intrudes upon the traveler's enjoyment of the view. A scenic corridor is the land generally adjacent to and visible from the highway and is identified using a motorist's line of vision. The corridor protection program seeks to encourage quality development that does not degrade the scenic value of the corridor.

State Scenic Highways are classified as either "eligible" or "officially designated." The status of a State Scenic Highway changes from eligible to officially designated when the local jurisdiction adopts a scenic corridor protection program, applies to the California Department of Transportation (Caltrans) for scenic highway approval, and receives notification from Caltrans that the highway has been officially designated as a scenic highway. When a city or county nominates an eligible scenic highway for official designation, it must identify and define the scenic corridor of the highway. The agency must also adopt ordinances to preserve the scenic quality of the corridor or document such regulations that already exist in various portions of local codes. These ordinances make up the scenic corridor protection program. Minimum requirements for scenic corridor protection include:

- Regulation of land use and density of development;
- Detailed land and site planning;
- Control of outdoor advertising (including a ban on billboards);
- Careful attention to and control of earthmoving and landscaping;
- Careful attention to design and appearance of structures and equipment; and

- Undergrounding of utility lines.

Local

Yolo County General Plan

The following polices related to aesthetics from the Yolo County General Plan were considered in this analysis:

- **Policy OS 9:** Yolo County shall plan to maintain scenic highways and waterways or riverbank corridor areas of scenic value as part of its open space preservation program and shall use persuasion and regulation to that end.

- **Policy OS 10:** Landscape Ordinance: Yolo County shall adopt a landscape ordinance and one purpose of such ordinance will be to preserve and enhance open spaces.

- **Policy CON 27:** Landscaping/Screening: Yolo County shall require assured landscaping between certain uses which may otherwise conflict. Landscaping shall be required along freeways, between commercial, industrial, and residential uses, in public road frontage setback areas, and in parking areas.

Sutter County General Plan

The following polices related to aesthetics from the Sutter County General Plan were considered in this analysis:

- **Policy 1.H-1**: The County shall require that new development be designed to utilize vegetation for screening structures and parking areas.

- **Policy 1.H-3:** The County shall require that design and development standards be applied to all industrial and commercial areas to improve the aesthetic appearance of those developments.

Sacramento County General Plan

The following polices related to aesthetics from the Sacramento County General Plan were considered in this analysis:

- **Policy PF-71:** Locate and design production and distribution facilities so as to minimize visual intrusion problems in urban areas and areas of scenic and/or cultural value, including the following:

- Recreation and historic areas;
- Scenic highways;
- Landscape corridors;
- State or Federal designated wild and scenic rivers;
- Visually prominent locations such as ridges, designated scenic corridors, and open viewsheds;
- Native American sacred sites.

- **Policy PF-72**: Locate and design energy production and distribution facilities in a manner that is compatible with surrounding land uses by employing the following methods when appropriate to the site:

  - Visually screen facilities with topography and existing vegetation and install landscaping consistent with surrounding land use zone development standards where appropriate, except where it would adversely affect photovoltaic performance or interfere with power-generating capability.
  - Provide site-compatible landscaping.
  - Minimize glare through siting, facility design, non-reflective coatings, etc.
  - Site facilities in a manner to equitably distribute their visual impacts in the immediate vicinity.

<u>Scenic Highway Goals</u>

1. To preserve and enhance the aesthetic quality of scenic roads without encouraging unnecessary driving by personal automobile.

<u>Scenic Highways Objectives</u>

1. To take necessary steps to preserve and enhance the scenic qualities of the Garden Highway.
2. To extend County scenic corridor protection to additional specific scenic roads in the rural portions of the County.
3. To strengthen the provisions of scenic corridor regulations so as to further protect the aesthetic values of the County's freeways and scenic roads.
4. To place a low priority on facilitation of pleasure auto driving and to encourage use of other modes of transportation.

Scenic Highways Polices

1. To strengthen the scenic corridor provisions of the Zoning Code to require design review of all signs and other structures within the corridor.
3. To fully enforce all sign controls in the scenic corridors.
4. To retain the scenic qualities of scenic corridors by avoiding unnecessary widening, straightening, or major reconstruction of scenic routes.
9. To investigate the desirability of requesting the State to designate the Garden Highway as an Official County Scenic Highway.
17. To investigate in coordination with other County agencies the provision of distinctive planting schemes, vista points, and picnic areas along scenic corridors.

Placer County General Plan

The following polices related to aesthetics from the Placer County General Plan were considered in this analysis:

- **Policy 1.E.1:** The County shall only approve new industrial development that has the following characteristics: e. Minimal adverse effects on scenic routes, recreation areas, and public vistas.

- **Policy 1.K.1:** The County shall require that new development in scenic areas e.g., river canyons, lake watersheds, scenic highway corridors, ridgelines, and steep slopes, is planned and designed in a manner which employs design, construction, and maintenance techniques that: a. Avoids locating structures along ridgelines and steep slopes; b. Incorporates design and screening measures to minimize the visibility of structures and graded areas; c. Maintains the character and visual quality of the area.

- **Policy 1.K.2:** The County shall require that new development in scenic areas be designed to utilize natural landforms and vegetation for screening structures, access roads, building foundations, and cut and fill slopes.

- **Policy 1.K.4:** The County shall require that new development incorporates sound soil conservation practices and minimizes land alterations. Land alterations should comply with the following guidelines: a. Limit cuts and fills; b. Limit grading to the smallest practical area of land; c. Limit land exposure to the shortest practical amount of time; d. Replant graded areas to ensure establishment of plant cover before the next rainy season; and e. Create grading contours that blend with the natural contours on-site or with contours on property immediately adjacent to the area of development.

- **Policy 1.K.5:** The County shall require that new roads, parking, and utilities be designed to minimize visual impacts. Unless limited by geological or engineering constraints, utilities should be installed underground and roadways and parking areas should be designed to fit the natural terrain.
- **Policy 1.O.9:** The County shall discourage the use of outdoor lighting that shines unnecessarily onto adjacent properties or into the night sky.

4.1.3 Significance Criteria

An adverse impact on aesthetic and visual resources is considered significant and would require mitigation if the proposed Project would:

1. Cause inconsistency with adopted visual resource management (VRM) plans or local ordinances. In those areas where no VRM plans exist, impacts were determined by examining the study area for sensitive viewsheds, areas of high user volumes, and areas of unique visual resources. Sensitive resources were then examined on a case-by-case basis to determine the level of impact. Significant visual impacts would be those that dominate the viewshed from sensitive locations and change the character of the landscape both in terms of physical characteristics and land uses;
2. Result in a substantial adverse effect on a scenic area or vista;
3. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic area or highway;
4. Substantially degrade the existing visual character or quality of the site and its surroundings; or
5. Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area.

4.1.4 Applicant Proposed Measures

No Applicant Proposed Measures (APMs) have been identified by PG&E related to aesthetics and visual resources.

4.1.5 Impact Analysis and Mitigation

Impact Discussion

Construction of the proposed pipeline would result in temporary visual changes in the landscape related to the presence of construction equipment, materials, and work crews. The resulting pipeline would be buried with minimal necessary aboveground facilities such as valve stations. Since a large majority of the pipeline traverses rural, sparsely populated agricultural lands, visual changes would not be noticeable by, or affect a substantial portion of the local population. The limited population affected by views of the temporary construction and resulting stations and pipeline markers are not considered sensitive viewers. Construction-related activities would be visible to vehicles traveling along roads paralleling the pipeline and to residences in proximity of the Project (less than 200 feet). Areas of the pipeline's construction that are considered aesthetically sensitive would be traversed utilizing horizontal directional drilling (HDD), in place of trenching, in order to minimize effects. These areas would include, but are not limited to, Knights Landing Ridge Cut, the western and eastern edges of the Yolo Bypass, and the Sacramento River.

Upon completion of the pipeline, all areas of construction would be restored in accordance with pre-arranged landowner requirements that would include, but are not limited to, soil decompaction, and reseeding to current existing conditions. As discussed in Section 4.4, Biological Resources, riparian areas, including trees, would not be affected as HDD methods would be used in these areas. If native, landmark, or heritage trees are removed or impacted during construction, they would be replaced according to mitigation measures set forth in Section 4.4, Biological Resources. Furthermore, APM BIO-17 Right-of-Way (ROW) Restoration Plan ensures that impacts to all vegetation are minimized and adequately mitigated to the satisfaction of the permitting agencies, property owners, and/or habitat managers. Restoration of vegetation in agricultural fields and landscaped areas would be negotiated with the landowners and would result in restoration of temporarily disturbed areas to conditions similar to preconstruction conditions.

Permanent changes in the aesthetics of the area would include the installation of aboveground line markers, cathodic protection test stations, and the construction of six stations containing necessary apparatus for pipeline operation. The pipeline would be marked in rural areas with aboveground line markers approximately 8 feet in height, white and orange in color (Figure 4.1-1), and spaced so that one marker can be seen in each direction of the pipeline from any point along the ROW. Test stations would be approximately 4 feet in height and orange in color. In non-rural areas, the pipeline would not be marked with aboveground markers and test stations would be installed in vaults flush with the ground.

The six aboveground stations would include the Capay Metering Station, approximately one acre in area, located at the connection of Line 400 and 401 and Line 406; the Yolo Junction Pressure Limiting Station, approximately 100 feet by 127 feet in area, located at the connection of Line 406 and Line 172A; the Baseline Road Pressure Regulating Station, approximately 84 feet by 145 feet in area, located at the junction of Line 407 and Line 123 near Roseville; the Powerline Road Pressure Regulating Station, approximately 40 feet by 102 feet in area, near corner of Powerline Road and West Elverta at the Powerline Road DFM terminus; the Powerline Road Main Line Valve with an area of approximately 100 feet by 100 feet at the intersection of Riego Road and Powerline Road; and the Baseline/Brewer Road Main Line Valve Station, approximately 50 feet by 50 feet in area, located west of the intersection of Brewer Road and Baseline Road. Refer to Figures 2-3, 2-4, 2-5, and 2-6 in Section 2.0, Project Description, for locations. All of the pressure limiting and regulating stations that are readily visible by the public would be enclosed by a fence with lathing of a color appropriate to the surrounding landscape. An example of an aboveground station is shown in Section 2.0, Project Description, Figure 2-8.

Visual Resource Management Plans and Local Ordinances

The Project would not cause inconsistency with adopted visual resource management (VRM) plans or local ordinances. In those areas where no VRM plans exist, impacts were determined by examining the study area for sensitive viewsheds, areas of high user volumes, and areas of unique visual resources. Much of the viewshed is sparsely populated. Areas at the eastern end of the pipeline that are more densely populated do not offer views of unique visual resources. Significant visual impacts would be those that dominate the viewshed from sensitive locations and change the character of the landscape in terms of physical characteristics and land uses. Because the pipeline would be buried and because the valve stations would be located in areas that have already been disturbed for agricultural or utility infrastructure uses, minimal changes would be made to the viewshed and character of the landscape. Potential impacts would be less than significant (Class III).

Scenic Areas or Vistas

The proposed Project crosses the Sacramento River, which is designated as a scenic corridor under the Scenic Highways Element of the Sacramento County General Plan. However, the proposed pipeline crosses the river approximately 1 mile north of the Sacramento County line in Yolo and Sutter counties. The Yolo County General Plan requires the maintenance of waterways and riverbank corridors as areas of scenic value. The Sutter County General Plan does not include specific regulations regarding the scenic values of the Sacramento River. In light of these regulations, the Sacramento River and its adjoining levees should be considered and protected as a scenic area.

At the location of the proposed pipeline, the river is flanked by levees of approximately 21 to 28 feet in height on both sides. The proposed pipeline will cross beneath both the levees and the river utilizing HDD technology in order to minimize visual and other impacts. HDD sites would not be visible from the river. HDD sites on each side of the river would be visible from the top of the levees; however, because Project construction is temporary and HDD sites would be removed upon completion, potential visual impacts are less than significant (Class III).

Scenic Resources

The Project would not substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic area or highway. No scenic resources within state scenic areas or highways are within viewable proximity to the Project.

There are no State designated scenic highways within the Project viewshed. However, the Yolo County General Plan identifies portions of CR-116, CR-16, and CR-117 as the Sacramento Northern River Scenic Route. The section of the proposed pipeline that would cross CR-117 would be installed underground via HDD, and therefore would not permanently alter the viewshed from any county roads. Additionally, Sacramento County's General Plan designates Garden Highway, which runs along the crown of the Sacramento River's eastern levee from the Sacramento city limits north to the Sutter County line, as a protected scenic corridor. While the proposed pipeline would cross Garden Highway, it would do so approximately 1 mile north of the Sutter County line and therefore outside of the designated scenic corridor.

Photograph 1: Example of Electrolysis Test Station.

Photograph 2: Example of Pipeline Marker.

Source: MBA 2008.

Michael Brandman Associates

Figure 4.1-1
Aboveground Pipeline Marker and Test Station

This portion of the pipeline would also be installed underground via HDD, and therefore would not permanently alter the viewshed from the road. Potential impacts would be less than significant (Class III).

Impact AES-1: Degrade the Existing Visual Character or Quality of the Site and Its Surroundings

The Project would substantially degrade the existing visual character or quality of the site and its surroundings (Potentially Significant, Class II).

Construction activities for the proposed Project would be short term, resulting in a temporary, and therefore less than significant, impact to visual character. The Project includes minimal aboveground facilities, such as valve and pressure limiting stations, which would be located in areas that have previously been disturbed for agricultural or utility infrastructure uses. Mitigation is proposed in Section 4.8, Hydrology and Water Quality, to require flood-proofing of any structures as required for placement within a 100-year floodplain. Both the Powerline Road Pressure Regulating Station and the Powerline Road Main Line Valve structures would be constructed within the 100-year floodplain and would be no more than 10 feet in height without the flood-proofing. The mitigation requires that the structures be raised approximately 1 foot above the 100-year storm flood profile level. While the ultimate height is unknown at this time, there is a single residence approximately 750 feet southeast of the Powerline Road Pressure Regulating Station, and there are no residences near the Powerline Road Main Line Valve. Therefore, the additional height would not result in an impact to aesthetic/visual resources. Also, since the viewshed surrounding the proposed pipeline has been modified for agricultural and residential uses, the line markers and valve stations would not be considered a significant change to the existing visual character.

Construction of the Project would require the removal of vegetation prior to trenching activities. APM BIO-17, as provided in Section 4.4, Biological Resources, specifically ensures that impacts to vegetation are minimized and adequately mitigated to the satisfaction of the permitting agencies, property owners, and/or habitat managers. Restoration of vegetation in agricultural fields and landscaped areas would be negotiated with the landowners and would result in restoration of temporarily disturbed areas to conditions similar to preconstruction conditions, thereby minimizing affects to visual resources caused by the removal of vegetation. Furthermore, if native trees are removed or impacted during construction they would be replaced according to BIO MM-2b, BIO MM-2c, and BIO MM-2d set forth in Section 4.4, Biological Resources.

The replanting of deep-rooted vegetation, such as orchards and vineyards, would not be allowed within 15 feet on either side of the pipeline. This restriction may result in a substantial impact to the visual character of an area where deep-rooted vegetation currently exists. Of specific concern is the removal of vegetation that currently screens rural residences along the proposed pipeline. Since landscaping vegetation is often non-native it would not be protected by mitigation set forth in Section 4.4, Biological Resources. Should such vegetation be removed and replacement restricted, the visual character of the Project site would be significantly changed as seen from the adjoining residence(s).

<u>Mitigation Measures for Impact AES-1: Degrade the Existing Visual Character or Quality of the Site and Its Surroundings</u>

MM AES-1 **Replanting of Screening Vegetation.** If deep-rooted vegetation that provides visual screening or acts as a visual resource to adjoining residences is removed, it shall be replaced in accordance with APM BIO-17. If the replanting of deep-rooted vegetation is not allowed within the permanent easement of the proposed pipeline, appropriate vegetation shall be replanted in a location outside the permanent easement but in a location that would recreate the visual screening and visual quality previously provided by the removed vegetation.

<u>Rationale for Mitigation</u>

The replanting of deep-rooted vegetation in a location outside the permanent easement but in a location that would recreate the visual quality provided by the removed vegetation would ensure that the visual character of the Project site, as seen by adjoining residences, would not be significantly impacted. Impacts would be reduced to less than significant.

Impact AES-2: Create New Source of Light or Glare

The Project would create a new source of substantial light or glare that would adversely affect day or nighttime views in the area (Potentially Significant, Class II).

Lighting at the pressure limiting, pressure regulating, and metering stations proposed for the Project would be minimal and would be used in emergency situations only.

At the 12 locations along the proposed pipeline where HDD would be implemented, lighting would be utilized to allow continuous, 24-hour construction operations. A light plant would be stationed at the entry and exit points of each HDD section and would consist of four 1,000-watt fixtures. Each site would be continuously under construction between two to four weeks. While the majority of HDD sites are located within rural agricultural areas, some sites may be located in proximity to rural households. Continuous construction requiring the use of light plants (mobile pole lighting) could result in light trespass onto nearby homes. While light trespass would be temporary, the contrast to rural lighting conditions typically found along the pipeline would result in a significant source of light.

<u>Mitigation Measures for Impact AES-2: Create New Source of Light or Glare</u>

MM AES-2 **Light Shielding and Positioning Away from Residences.** HDD sites within close proximity of rural residences that would utilize lighting and operate between dusk and dawn shall be required to appropriately shield and direct all lighting away from nearby rural residences in order to reduce light trespass to the maximum extent feasible. Lighting shall be positioned and shielded to provide adequate nighttime illumination for construction workers while minimizing affects on nearby homes.

<u>Rationale for Mitigation</u>

Implementation of directional and shielded lighting would reduce light trespass onto nearby residences thereby reducing the temporary intrusion of construction lighting. Impacts would be reduced to less than significant.

4.1.6 Impacts of Alternatives

A No Project Alternative as well as twelve options have been proposed for the alignment in order to minimize or eliminate environmental impacts of the proposed Project and to respond to comments from nearby landowners. The twelve options, labeled A through L, have been analyzed in comparison to the portion of the proposed route that would be avoided as a result of any of the options. Descriptions of the options can be found in Section 3.0, Alternatives and Cumulative Projects, and the options are depicted in Figure 3-2A through 3-2K.

No Project Alternative

Under the No Project Alternative, no natural gas pipeline would be constructed. As such, this alternative would cause no impacts to aesthetics and visual resources. The No Project Alternative would result in no impacts compared to the proposed Project.

Option A

Option A would shift approximately 14 miles of pipeline from the more densely populated rural area around Line 406 to the sparsely populated area to the north. Under Option A. the alternative Capay Metering station would be moved approximately 1.5 miles north of where it would be placed under the proposed Project.

Under both Option A and the proposed Project, the majority of the construction activities would be occurring within agricultural parcels or parallel agricultural parcel boundaries. Option A and the proposed Project would cross a similar distance of Dunnigan Hills. In addition, both Option A and the proposed Project would parallel agricultural parcel boundaries when not bisecting agricultural fields or the Dunnigan Hills area. Both Option A and the proposed Project would utilize HDD to cross under I-505 and I-5. There are no residences within 200 feet of the I-505 HDD crossing under Option A or the proposed Project.

Approximately 7.25 miles of construction would bisect open areas or agricultural lands under Option A, approximately 1 mile less than would occur under the proposed Project. Option A would increase the total distance of Line 406 construction adjacent to rural roadways by approximately 1 mile, thereby increasing the potential for aesthetics impacts to viewers traveling along roadways.

Under Option A, only one residence would be located within 200 feet of the pipeline construction, whereas eight residences would be located within 200 feet of construction for the proposed Project. Under Option A, the nearest residence to an HDD crossing would be located approximately 490 feet away from the HDD construction pit. The residence nearest the proposed Project's HDD crossing would be located approximately 100 feet from the HDD construction pit. Therefore, the potential construction-related aesthetics impacts on nearby residences would be slightly less under Option A than for the proposed Project.

Aesthetic impacts of Option A would be slightly less than under the proposed project. However, similar to the proposed project, impacts associated with Option A would be potentially significant (Class II). Implementation of MM AES-1 and AES-2 would be required to reduce impacts to less than significant.

Option B

Option B would shift approximately 6.5 miles of pipeline from the more densely populated rural area around Line 406 to the sparsely populated area to the north. Under Option B. the alternative Capay Metering station would be moved approximately 1.5 miles north of where it would be placed under the proposed Project.

Under both Option B and the proposed Project, a portion of the construction activities would be occurring within agricultural parcels or parallel agricultural parcel boundaries. Both Option B and the proposed Project would utilize HDD to cross under I-505. There are no residences within 200 feet of the I-505 HDD crossing under Option B or the proposed Project.

Approximately 3.4 miles of construction would bisect open areas or agricultural lands under Option B, approximately 2 mile less than would occur under the proposed Project. Option B would increase the total distance of Line 406 construction adjacent to rural roadways by approximately 3 miles, thereby increasing the potential for aesthetics impacts to viewers traveling along roadways.

There are no residences located within 200 feet of the pipeline construction under Option B or proposed Project. Therefore, the potential construction-related aesthetics impacts on nearby residences would be identical under Option B as for the proposed Project.

Aesthetic impacts of Option B would be slightly more than under the proposed project. However, similar to the proposed project, impacts associated with Option B would be potentially significant (Class II). Implementation of MM AES-1 would be required to reduce impacts to less than significant.

Option C

Option C would shift approximately 1 mile of pipeline from bisecting two agricultural fields to approximately 750 feet north to parallel the agricultural field boundaries. Under Option C, the Capay Metering station would be remain in the same location as under the proposed Project.

Under both Option C and the proposed Project, the construction activities would be occurring exclusively in agricultural lands. Option C and the proposed Project would cross under CR-85, thereby creating the potential for aesthetics impacts to viewers traveling along the road. Option C does not increase the visibility of construction activities to viewers along CR-85; therefore, the potential impacts to viewers remains the same as for the proposed Project.

There are no residences located within 200 feet of the pipeline construction under Option C or proposed Project. Therefore, the potential construction-related aesthetics impacts on nearby residences would be identical under Option C as for the proposed Project.

Aesthetic impacts of Option C would be similar to the proposed project. Similar to the proposed project, impacts associated with Option C would be potentially significant (Class II). Implementation of MM AES-1 would be required to reduce impacts to less than significant.

Option D

Option D would shift a nearly 2-mile portion of pipeline from bisecting ten agricultural fields located between CR-17 and CR-19, to the agricultural field boundaries near CR-17.

Approximately one third of a mile of construction would be along parcel boundaries of open areas or agricultural lands under Option D, approximately 1.3 mile less than would occur under the proposed Project. Option D would increase the total distance of Line 406 construction adjacent to rural roadways by almost 1.5 miles, thereby increasing the potential for aesthetics impacts to viewers traveling along CR-17.

Under Option D, five residences would be located within 200 feet of the pipeline construction, whereas no residences would be located within 200 feet of construction for the proposed Project. Therefore, the potential construction-related aesthetics impacts on nearby residences would be greater under Option D than for the proposed Project.

Aesthetic impacts of Option D would be greater than under the proposed Project. However, similar to the proposed Project, impacts associated with Option D would be potentially significant (Class II). Implementation of MM AES-1 would be required to reduce impacts to less than significant.

Option E

Option E would shift a portion of pipeline from agricultural fields located between CR-17 and CR-19, to CR-19 to the south.

Approximately 0.5 mile of construction would be along parcel boundaries of open areas or agricultural lands under Option E, approximately 1 mile less than would occur under the proposed Project. Option E would increase the total distance of Line 406 construction adjacent to rural roadways by more than 1.5 miles, thereby increasing the potential for aesthetics impacts to viewers traveling along CR-19.

Under Option E, three residences would be located within 200 feet of the pipeline construction, whereas no residences would be located within 200 feet of construction for the proposed Project. Therefore, the potential construction-related aesthetics impacts on nearby residences would be greater under Option E than for the proposed Project.

Aesthetic impacts of Option E would be greater than under the proposed Project. However, similar to the proposed Project, impacts associated with Option E would be potentially significant (Class II). Implementation of MM AES-1 would be required to reduce impacts to less than significant.

Option F

Option F would shift a north-south portion of pipeline, located northwest of the intersection of CR-17 and CR-96, east by approximately 650 feet.

Option F would increase the total distance of Line 406 construction adjacent to rural roadways by less than 0.25 mile thereby slightly increasing the potential for aesthetics impacts to viewers traveling along CR-17.

Under Option F, no residences would be located within 200 feet of the pipeline construction, whereas one residence would be located within 200 feet of construction for the proposed Project. Therefore, the potential construction-related aesthetics impacts on nearby residences would be less under Option F than for the proposed Project.

Aesthetic impacts of Option F would be slightly less than under the proposed project. However, similar to the proposed project, impacts associated with Option F would be potentially significant (Class II). Implementation of MM AES-1 would be required to reduce impacts to less than significant.

Option G

Option G would relocate the pipeline from the north side of a residential area and bisecting an agricultural field to the south side of the residential area and located along the agricultural field boundary paralleling the roadway. Under both Option G and the proposed Project, the majority of the construction activities would be occurring in or adjacent to agricultural lands. Option G and the proposed Project would parallel a similar distance of country roads.

There are three residences located within 200 feet of Option G and the proposed Project. Under Option G, however, the nearest residence would be located approximately 10 feet closer to construction activities than under the proposed Project.

Aesthetic impacts of Option G would be slightly more than under the proposed project. However, similar to the proposed project, impacts associated with Option F would be potentially significant (Class II). Implementation of MM AES-1 would be required to reduce impacts to less than significant.

Option H

Option H would shift almost 5.5 miles of pipeline from the more densely populated rural area around Line 407 West to the sparsely populated area to the south. Under Option H, the Powerline Road Main Line Valve, the Powerline Road Pressure Regulating Station, and the DFM alignment would remain the same as under the proposed Project.

Under both Option H and the proposed Project, the majority of the construction activities would be occurring adjacent to country roads. Option H and the proposed Project would utilize HDD to cross the West Side of the Yolo Bypass, the Tule Canal, the Sacramento River, and the Spangler Canal. In addition, both Option H and the proposed Project would cross Garden Highway, which, according to the Sacramento County General Plan, is a protected scenic corridor from the Sacramento city limit north to the Sutter County line. Option H and the proposed Project would cross a similar distance of agricultural lands.

Option H would decrease the total distance of Line 406 West construction adjacent to rural roadways by approximately 0.5 mile, thereby reducing the potential for aesthetics impacts to viewers traveling along roadways.

Under Option H, only one residence would be located within 200 feet of the pipeline construction, whereas five residences would be located within 200 feet of construction for the proposed Project. Under Option H, the nearest residence to an HDD crossing would be located more than 2,000 feet away from the HDD construction pit. The residence nearest the proposed Project's HDD crossing would be located approximately 360 feet from the HDD construction pit. Therefore, the potential construction-related aesthetics impacts on nearby residences would be less under Option H than for the proposed Project.

Aesthetic impacts of Option H would be less than under the proposed project. However, similar to the proposed project, impacts associated with Option A would be potentially significant (Class II). Implementation of MM AES-1 would be required to reduce impacts to less than significant.

Option I

Option I would shift approximately 1 mile of pipeline from the more densely populated rural area around Line 407 East along Base Line Road to the sparsely populated rural area to the north.

Approximately 1 mile of construction would bisect open areas or agricultural lands under Option I, whereas the construction of the proposed Project would occur along parcel boundaries paralleling Base Line Road. Option I would decrease the total distance of Line 406 construction adjacent to rural roadways by approximately 0.5 mile, thereby reducing the potential for aesthetics impacts to viewers traveling along Base Line Road.

Under Option I, four residences would be located within 200 feet of the pipeline construction, whereas eight residences would be located within 200 feet of construction for the proposed Project. Therefore, the potential construction-related aesthetics impacts on nearby residences would be less under Option I than for the proposed Project.

Aesthetic impacts of Option I would be less than under the proposed project. However, similar to the proposed project, impacts associated with Option I would be potentially significant (Class II). Implementation of MM AES-1 would be required to reduce impacts to less than significant.

Option J

Option J would shift approximately 1 mile of pipeline from the more densely populated rural area around Line 407 East along Baseline Road to the sparsely populated rural area to the north.

More than 1 mile of construction would bisect open areas or agricultural lands under Option J, whereas the construction of the proposed Project would occur along parcel boundaries paralleling Base Line Road. Option J would decrease the total distance of Line 406 construction adjacent to rural roadways by almost 0.25 mile, thereby reducing the potential for aesthetics impacts to viewers traveling along Base Line Road.

Under Option J, six residences would be located within 200 feet of the pipeline construction, whereas eight residences would be located within 200 feet of construction for the proposed Project. Therefore, the potential construction-related aesthetics impacts on nearby residences would be less under Option J than for the proposed Project.

Aesthetic impacts of Option J would be less than under the proposed project. However, similar to the proposed project, impacts associated with Option J would be potentially significant (Class II). Implementation of MM AES-1 would be required to reduce impacts to less than significant.

Option K

Option K would shift approximately 0.35 mile of pipeline from Base Line Road to the annual grassland to the north.

Under Option K, temporary construction activities would be less visible to road traffic located on Base Line Road, where approximately 1,000 feet of the route would not be aligned with the roadway. There are no residences within 200 feet of Option K or the proposed Project. Aesthetic impacts of Option K would be less than under the proposed project. However, similar to the proposed project, impacts associated with Option K would be potentially significant (Class II). Implementation of MM AES-1 would be required to reduce impacts to less than significant.

Option L

Under Option L, a portion of the proposed Project adjacent to Base Line Road would be constructed utilizing HDD instead of trenching. Option L would not change the location of the route, but would change the construction method from trenching to HDD. As discussed in Impact AES-2, HDD construction utilizes nighttime lighting that may trespass onto nearby homes. However, there are no residences located near Option L. As such, impacts to aesthetics under Option L would be similar to the proposed route and would be potentially significant (Class II). Implementation of MM AES-1 and MM AES-2 would be required to reduce impacts to less than significant.

Table 4.1-1: Comparison of Alternatives for Aesthetics and Visual Resources

Alternative	Comparison with Proposed Project
No Project	No Impacts
Option A	Slightly Fewer Impacts
Option B	Slightly Greater Impacts
Option C	Similar Impacts
Option D	More Impacts
Option E	More Impacts
Option F	Slightly Fewer Impacts
Option G	Slightly Greater Impacts
Option H	Fewer Impacts
Option I	Fewer Impacts
Option J	Fewer Impacts
Option K	Fewer Impacts
Option L	Similar Impacts
Source: Michael Brandman Associates 2009.	

4.1.7 Cumulative Projects Impact Analysis

Other projects within this Project's vicinity that would affect aesthetics include road construction within the Sutter Pointe Specific Plan, the Placer Vineyards Specific Area Plan, and the Sierra Vista Specific Plan. The concurrent construction of the aforementioned projects within the vicinity of the natural gas pipeline discussed in this document would increase the amount of visual disturbance from construction activities. However, since the natural gas pipeline would be buried upon completion and the remaining aboveground facilities would be located in areas already developed by agriculture or utility infrastructure, affects would be temporary and would therefore not contribute to permanent cumulative impacts on aesthetics and visual resources.

4.1.8 Summary of Impacts and Mitigation Measures

Table 4.1-2 presents a summary of impacts on aesthetics and visual resources and the recommended mitigation measures.

Table 4.1-2: Summary of Aesthetics and Visual Resources Impacts and Mitigation Measures

Impact	Mitigation Measure
AES-1. Degrade the existing visual character or quality of the site and its surroundings.	**AES-1.** Replanting of screening vegetation.
AES-2. Create new source of light or glare.	**AES-2.** Light shielding and positioning away from residences.
Source: Michael Brandman Associates 2009.	

4.2 AGRICULTURAL RESOURCES

This Section provides a discussion of existing agricultural resources and an analysis of potential impacts that may result from Project implementation. Included are descriptions of the environmental setting in terms of existing agricultural resources that could be affected by the proposed Project.

4.2.1 Environmental Setting

The proposed pipeline is approximately 40 miles long and traverses through Yolo, Sutter, Sacramento, and Placer counties. Nearly all of the proposed pipeline crosses Prime Farmland, Unique Farmland, Farmland of Statewide Importance, Farmland of Local Importance, Grazing Land, and land under Williamson Act contracts. Agricultural uses in the Project area include rice fields, row crops, orchards, and grazing land.

Yolo County

Yolo County has placed importance on agricultural land preservation and enacted some of the earliest ordinances that limit use of agricultural lands, create minimum parcel sizes, and implement the Williamson Act. In 2006, the total agricultural commodity value was over $330 million, surpassing the 2005 value by more than $40 million (Yolo County 2006 Crop Report). The top ten commodities, in order, are tomatoes, hay/alfalfa, grapes/wine, almonds, seed crops, rice, walnuts, organic crops, cattle and calves, and apiary/livestock/poultry products. Table 4.2-1 below shows the 2005 and 2006 agricultural industry production values.

Table 4.2-1: Yolo County Agricultural Production Summary, 2005 to 2006

Industry	Value of Production ($)	
	2005	2006
Fruit and Nut Crops	103,007,000	94,837,723
Field Crops	87,282,000	114,350,583
Vegetable Crops	76,518,000	86,704,112
Livestock/Poultry	15,474,000	13,789,308
Livestock/Poultry Products	3,933,000	5,271,300
Nursery Products	6,029,000	8,132,784
Apiary Products	2,575,000	3,845,391

Industry	Value of Production ($)	
	2005	2006
Seed Crops	21,413,000	28,767,033
Organic Production	13,914,000	14,497,739
Total Value in Dollars	330,145,000	370,195,973
Source: Yolo County 2006.		

The California Department of Conservation (DOC) monitors agricultural land use through its Farmland Mapping and Monitoring Program (FMMP). According to the FMMP, agricultural land decreased in Yolo County by 27,030 acres since 1984 on an average of 1,352 acres per year. Between 2002 and 2004, 2,287 net acres were converted to nonagricultural uses, as shown in Table 4.2-2. Within Yolo County, the proposed Project would traverse areas of Prime Farmland, Farmland of Statewide Importance, Unique Farmland, Farmland of Local Importance, Farmland of Local Potential, and Grazing Land.

Table 4.2-2: Farmland Conversion from 2002 to 2004 in Yolo County

Land Use Category	Total Acres Inventoried		2002 to 2004 Acreage Changes		
	2002	2004	Acres Lost	Acres Gained	Net Change
Prime Farmland	261,648	259,637	2,602	591	-2,011
Farmland of Statewide Importance	18,007	18,123	154	270	116
Unique Farmland	54,586	53,157	2,180	751	-1,429
Farmland of Local Importance	67,546	66,619	2,313	1,386	-927
Grazing Land	143,263	145,227	343	2,307	1,964
Agricultural Land Subtotal	545,050	542,763	7,592	5,305	-2,287
Source: California Department of Conservation 2006.					

Sutter County

In 2006, the total agricultural production value was more than $358 million, exceeding the 2005 value by more than $53 million (Sutter County 2006 Crop, Livestock, and Annual Department Report). The ten leading crops by value in 2006 were rice, dried plums (prunes), walnuts, peaches, nursery products, tomatoes, cattle/calves, almonds, melons, and alfalfa. Table 4.2-3 below shows the 2005 and 2006 agricultural industry production values.

Table 4.2-3: Sutter County Agricultural Production Summary, 2005 to 2006

Industry	Value of Production ($)	
	2005	2006
Fruit and Nut Crops	123,834,400	158,918,900
Field Crops	116,674,300	130,626,000
Vegetable Crops	19,788,600	21,564,300
Livestock/Poultry	12,147,100	12,363,300
Livestock/Poultry Products	3,820,800	3,710,600
Nursery Products	11,058,300	12,736,500
Apiary Products	3,497,900	3,973,400
Seed Crops	14,368,790	14,951,900
Total Value in Dollars	305,190,190	358,845,200
Source: Sutter County 2006.		

Sutter County's agricultural land totals have been monitored by the FMMP since 1988. Between 1988 and 2004, agricultural land decreased by 19,029 acres, resulting in an average loss of 1,057 net acres per year. Between 2002 and 2004, 1,926 net acres were converted to nonagricultural uses, as shown in Table 4.2-4. Within Sutter County, the proposed Project would traverse areas of Prime Farmland, Farmland of Statewide Importance, and Grazing Land.

Table 4.2-4: Farmland Conversion from 2002 to 2004 in Sutter County

Land Use Category	Total Acres Inventoried		2002 to 2004 Acreage Changes		
	2002	2004	Acres Lost	Acres Gained	Net Change
Prime Farmland	167,436	166,203	1,509	276	-1,233
Farmland of Statewide Importance	108,750	107,743	1,169	162	-1,007
Unique Farmland	19,482	19,480	267	265	-2
Farmland of Local Importance	0	0	0	0	0
Grazing Land	50,321	50,637	617	933	316
Agricultural Land Subtotal	345,989	344,063	3,562	1,636	-1,926
Source: California Department of Conservation 2006.					

Sacramento County

The majority of Sacramento County's non-urban lands are used for agricultural purposes. The county's total 2006 crop production value of $306.8 million represents a 12 percent reduction from 2005 values (Sacramento County 2006 Crop and Livestock Report). The reduction of $42 million was due to weather-related issues; a wet spring resulted in unplanted fields, late plantings, and reduction in crop production. The 2006 leading farm commodities were grapes/wine, milk (market), nursery stock, Bartlett pears, poultry, cattle/calves, tomatoes, corn (field), hay/alfalfa, and corn (silage). Table 4.2-5 below shows the 2005 and 2006 agricultural industry production values.

Table 4.2-5: Sacramento County Agricultural Production Summary, 2005 to 2006

Industry	Value of Production ($)	
	2005	2006
Fruit and Nut Crops	136,190,000	107,930,000
Field Crops	43,362,000	35,721,000
Vegetable Crops	32,196,000	28,128,000

Industry	Value of Production ($)	
	2005	2006
Livestock/Poultry	44,458,000	54,106,000
Livestock/Poultry Products	52,100,000	41,145,000
Nursery Products	36,544,000	36,738,000
Apiary Products	35,000	451,000
Seed Crops	4,000,000	3,027,000
Total Value in Dollars	348,885,000	306,846,000
Source: Sacramento County 2006.		

Between 1988 and 2004, agricultural land in Sacramento County decreased by 40,264 acres, resulting in an average loss of 2,517 net acres per year. Between 2002 and 2004, 6,891 net acres were converted to nonagricultural uses, as shown in Table 4.2-6. Within Sacramento County, the proposed Project would traverse areas of Prime Farmland and Farmland of Statewide Importance

Table 4.2-6: Farmland Conversion from 2002 to 2004 in Sacramento County

Land Use Category	Total Acres Inventoried		2002 to 2004 Acreage Changes		
	2002	2004	Acres Lost	Acres Gained	Net Change
Prime Farmland	112,037	110,278	1,818	59	-1,759
Farmland of Statewide Importance	60,817	56,141	4,796	120	-4,676
Unique Farmland	15,743	15,188	637	82	-555
Farmland of Local Importance	37,924	39,873	2,795	4,744	1,949
Grazing Land	165,023	163,173	2,288	438	-1,850
Agricultural Land Subtotal	391,544	384,653	12,334	5,443	-6,891
Source: California Department of Conservation 2006.					

Placer County

The 2006 gross value of agriculture production for Placer County was $52.7 million. This was a $10 million decline since the previous year (Placer County 2006 Agricultural Crop Production Report). Both a wet spring and development pressures negatively affected rice production by nearly $3 million, which attributed to the decline in production value. Products leading the industry are nursery products, timber production, cattle/calves, rice, and walnuts. Table 4.2-7 below shows the 2005 and 2006 agricultural industry production values.

Table 4.2-7: Placer County Agricultural Production Summary, 2005 to 2006

Industry	Value of Production ($)	
	2005	2006
Fruit and Nut Crops	7,758,700	7,470,691
Field Crops	17,166,800	14,654,900
Vegetable Crops	500,000	401,103
Livestock/Poultry	20,396,500	13,101,226
Livestock/Poultry Products	2,400,000	3,000,000
Nursery Products	13,998,300	13,579,420
Apiary Products	118,000	507,550
Seed Crops	N/A	N/A
Total Value in Dollars	62,338,300	52,714,890

Source: Placer County 2006.

Agricultural lands in Placer County have continually decreased between 1984 and 2004. During this period, 38,631 acres of agricultural land was converted to nonagricultural uses, resulting in an average loss of 1,932 acres per year. Between 2002 and 2004, agricultural land decreased from 545,050 to 542,763, a difference of 2,287 acres, as shown in Table 4.2-8. Within Placer County, the proposed Project would traverse areas of Farmland of Local Importance.

Table 4.2-8: Farmland Conversion from 2002 to 2004 in Placer County

Land Use Category	Total Acres Inventoried		2002 to 2004 Acreage Changes		
	2002	2004	Acres Lost	Acres Gained	Net Change
Prime Farmland	9,538	9,236	433	131	-302
Farmland of Statewide Importance	5,493	5,509	386	402	16
Unique Farmland	22,105	23,283	507	1,685	1,178
Farmland of Local Importance	87,832	86,234	2,393	795	-1,598
Grazing Land	50,478	46,000	4,685	207	-4,478
Agricultural Land Subtotal	175,446	170,262	8,404	3,220	-5,184
Source: California Department of Conservation 2006.					

Important Farmlands

The DOC monitors agricultural land use through its FMMP. The FMMP, established in 1982, is a non-regulatory program and provides a consistent and impartial analysis of agricultural land use and land use changes throughout California. The FMMP produces maps and statistical data used for analyzing impacts on California's agricultural resources. Within the FMMP, land is generally grouped into one of the following categories:

- **Prime Farmland:** Farmland with the best combination of physical and chemical features able to sustain long-term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.

- **Farmland of Statewide Importance(s):** Farmland similar to Prime Farmland but with minor shortcomings, such as greater slopes or less ability to store soil moisture. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.

- **Unique Farmland:** Farmland of lesser quality soils used for the production of the State's leading agricultural crops. This land is usually irrigated, but may include non-irrigated orchards or vineyards as found in some climatic zones in California. Land must have been cropped at some time during the 4 years prior to the mapping date.

- **Farmland of Local Importance:** Land of importance to the local agricultural economy as determined by each county's board of supervisors and a local advisory committee.

- **Grazing Land:** Land on which the existing vegetation is suited to the grazing of livestock. This category was developed in cooperation with the California Cattlemen's Association, University of California Cooperative Extension, and other groups interested in the extent of grazing activities. The minimum mapping unit for Grazing Land is 40 acres.

- **Urban and Built-Up Land:** Land occupied by structures with a building density of at least one unit to 1.5 acres, or approximately six structures to a 10-acre parcel. This land is used for residential, industrial, commercial, institutional, public administrative purposes, railroad and other transportation yards, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, water control structures, and other developed purposes.

- **Other Land:** Land not included in any other mapping category. Common examples include low density rural developments; brush, timber, wetland, and riparian areas not suitable for livestock grazing; confined livestock, poultry or aquaculture facilities; strip mines, borrow pits; and water bodies smaller than 40 acres. Vacant and nonagricultural land surrounded on all sides by urban development and greater than 40 acres is mapped as Other Land.

- **Water:** Perennial water bodies with an extent of at least 40 acres.

The proposed Project would include a temporary 100-foot right-of-way (ROW) to allow for construction of the pipeline. Upon Project completion, a permanent 50-foot easement along the entire length of the Lines 406 and 407 would remain. A permanent 35-foot easement would remain along the entire length of the Powerline Road Distribution Feeder Main (DFM). It is PG&E’s standard policy to obtain permanent easements surrounding underground pipelines for purposes of pipeline maintenance and to minimize potential damage and disruption to infrastructure if ground-disturbance activity is proposed near the pipeline.

Figures 4.2-1A, 4.2-1B, and 4.2-1C show the approximate pipeline alignment as well as FMMP land use categories.

The 2004 FMMP maps for Yolo, Sutter, Sacramento, and Placer counties indicate that the temporary construction ROW (100 feet) would affect approximately 511.42 acres of farmland, including the permanent easement (50 feet for Lines 406 and 407, and 35 feet for the Powerline Road DFM) which would affect approximately 250.84 acres of farmland. Summaries of affected farmland acreage are illustrated in Table 4.2-9 and Table 4.2-10.

Table 4.2-9: Farmland Acreage Summary - Temporary Right-of-Way

Farmland Designation[a]	Temporary ROW Acreage[b]				
	County				Total Temporary ROW Acreage
	Yolo	Sutter	Sacra-mento	Placer	
Important Farmland					
Prime Farmland	237.47	23.83	4.68	0	265.98
Farmland of Statewide Importance	5.22	43.44	13.56	0	62.23
Unique Farmland	15.89	0	0	0	15.89
Farmland of Local Importance	0	0	0	64.47	64.47
Farmland of Local Potential	58.49	0	0	0	58.49
Grazing Land	9.54	12.72	0	0	22.26
Other[c]	2.19	11.26	0	8.66	22.10
Total Acreage	**328.80**	**91.25**	**18.24**	**73.13**	**511.42**

Notes:
a Areas affected by the Project that are designated as urban and built up land or water are not included in this table.
b Acreage totals for individual farmland classifications within the 100-foot temporary construction ROW. Values calculated by PG&E.
c Land not included in any other mapping category. Common examples include low density rural developments; brush, timber, wetland, and riparian areas not suitable for livestock grazing; confined livestock, poultry or aquaculture facilities; strip mines, borrow pits; and water bodies smaller than 40 acres. Vacant and nonagricultural land surrounded on all sides by urban development and greater than 40 acres is mapped as Other Land.
ROW = Right-of-way.
Source: California Department of Conservation 2004, PG&E 2008, Michael Brandman Associates 2008.

Table 4.2-10: Farmland Acreage Summary - Within Permanent Easement

Farmland Designation[a]	Permanent Easement Acreage [b]				
	County				Total Permanent Easement Acreage
	Yolo	Sutter	Sacramento	Placer	
Important Farmland					
Prime Farmland	113.3	12.58	2.06	0	127.94
Farmland of Statewide Importance	2.71	21.74	4.47	0	28.92
Unique Farmland	13.07	0	0	0.74	13.81
Farmland of Local Importance	22.19	0	0	31.49	53.68
Farmland of Local Potential	4.82	0	0	0	4.82
Grazing Land	5.54	4.58	0	0.02	10.14
Other[c]	0.95	5.51	0	5.07	11.53
Total Acreage	**162.58**	**44.41**	**6.53**	**37.32**	**250.84**

Notes:

a Areas affected by the Project that are designated as urban and built up land or water are not included in this table.

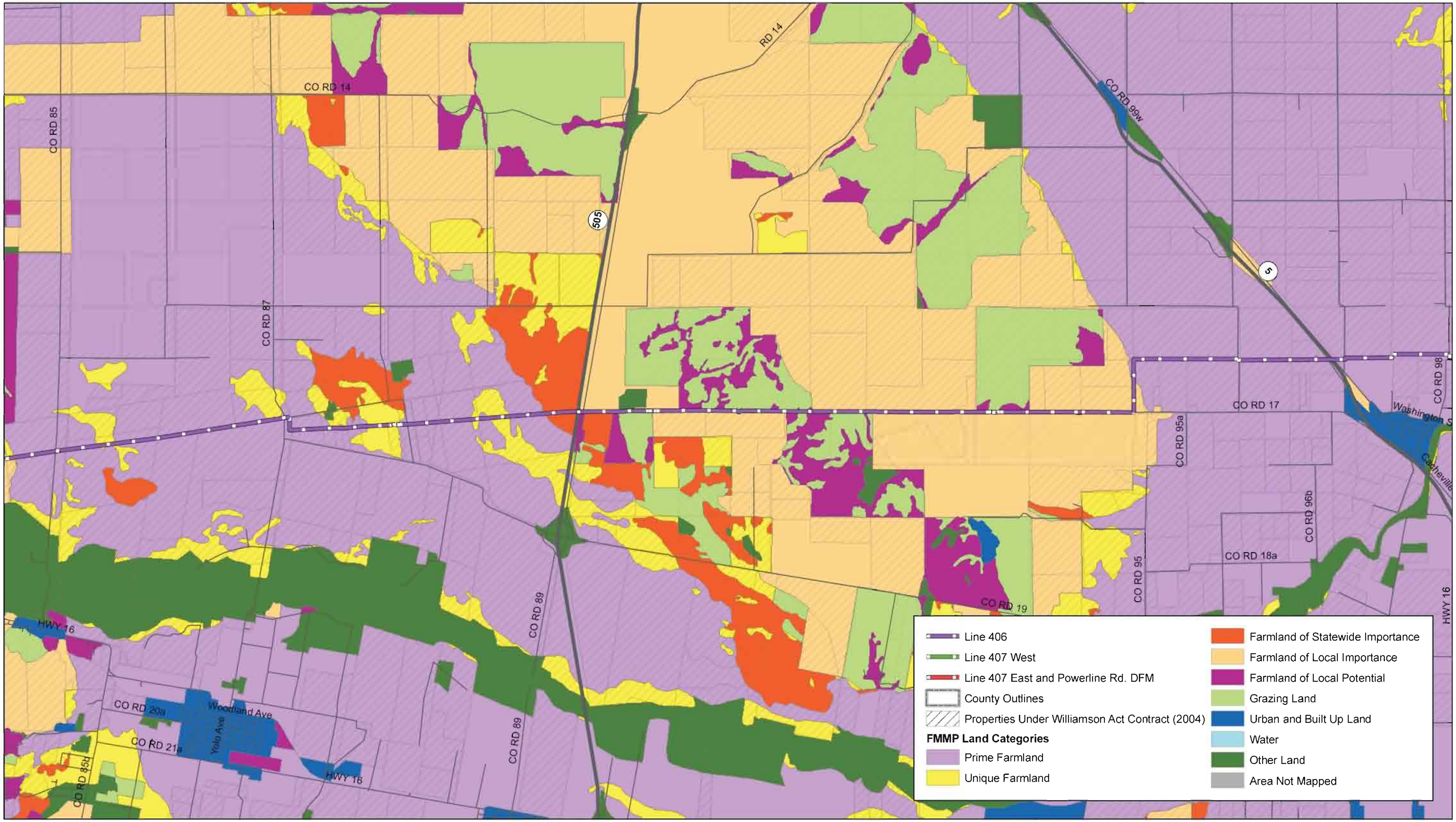
b Acreage totals for individual farmland classifications within the 50-foot (line 406 and 407) and 35-foot (Powerline DFM) permanent easements. Values calculated by MBA.

c Land not included in any other mapping category. Common examples include low density rural developments; brush, timber, wetland, and riparian areas not suitable for livestock grazing; confined livestock, poultry or aquaculture facilities; strip mines, borrow pits; and water bodies smaller than 40 acres. Vacant and nonagricultural land surrounded on all sides by urban development and greater than 40 acres is mapped as Other Land.

Source: California Department of Conservation 2004 and Michael Brandman Associates 2008.

Williamson Act Contracts

Between 2006 and 2007, acreage under Williamson Act contracts increased in Yolo, Sutter, and Sacramento counties by 457, 5,845, and 498 acres, respectively. Contract land decreased in Placer County by 2,421 acres during the same period. Table 4.2-11 indicates the amount of acreage under Williamson Act contracts for the years 2006 and 2007 in each of the four Project counties. For an explanation of the Williamson Act and its regulations, refer to Section 4.2.2, Regulatory Setting.



Source: Adapted from PG&E, 2009.

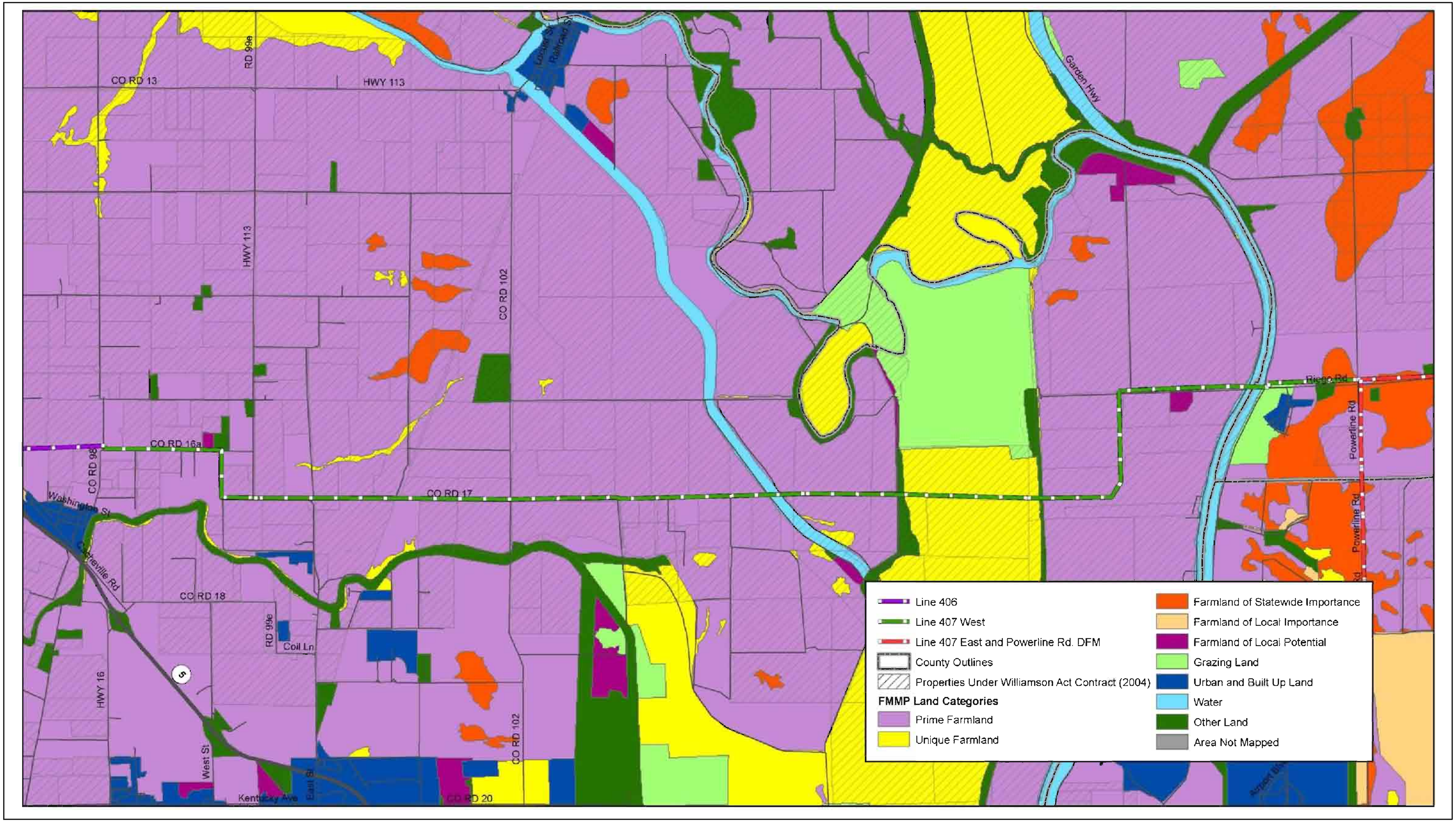
Michael Brandman Associates

NORTH

Not to Scale

Figure 4.2-1A

Agricultural Lands: FMMP Designations and Lands Under Williamson Act Contracts



Source: Adapted from PG&E 2008.

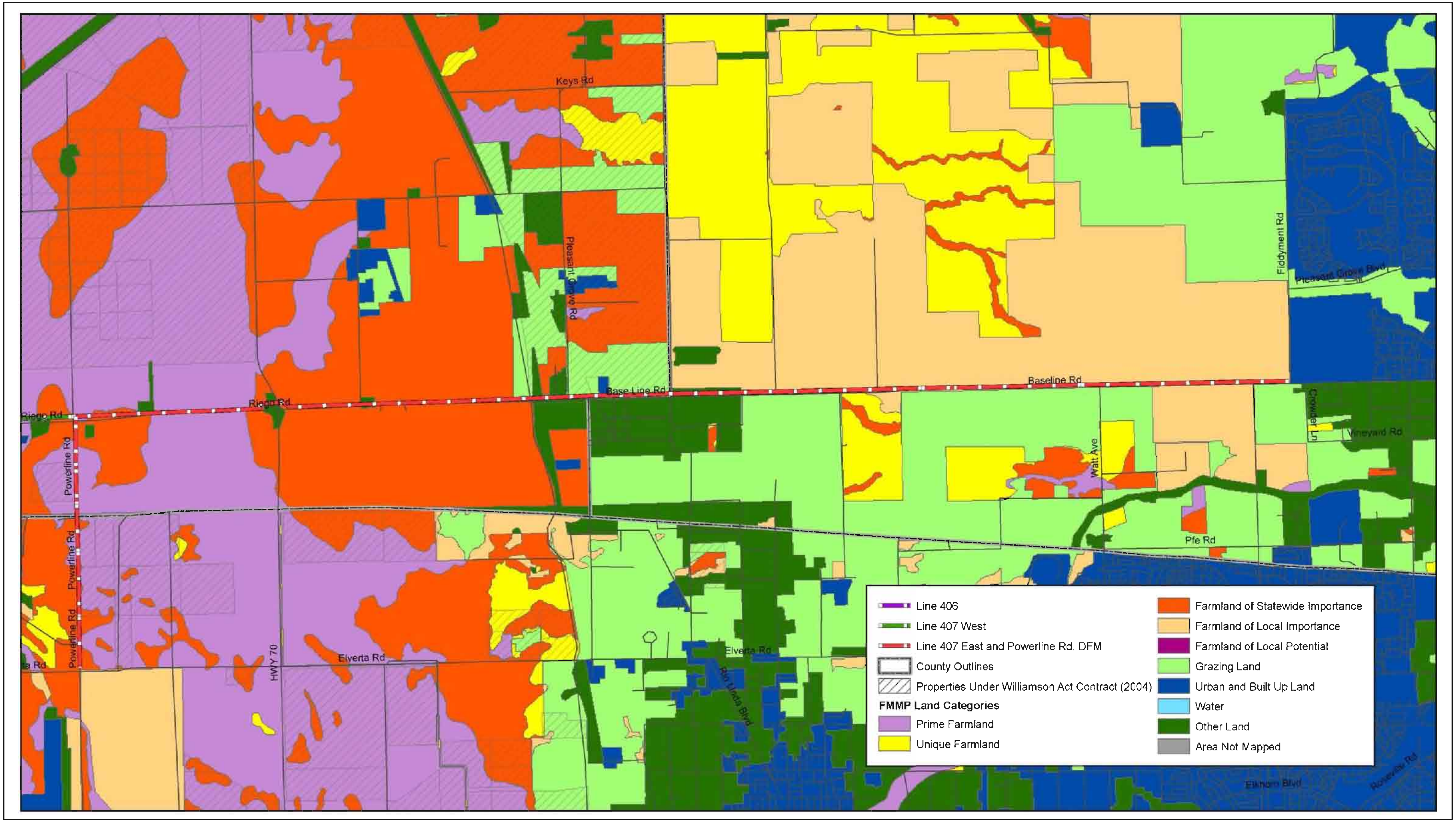
Michael Brandman Associates

NORTH

Not to scale

Figure 4.2-1B

Agricultural Lands: FMMP Designations and Lands Under Williamson Act Contracts



Source: Adapted from PG&E 2008.

Michael Brandman Associates

NORTH

Not to scale

Figure 4.2-1C

Agricultural Lands: FMMP Designations and Lands Under Williamson Act Contracts

Table 4.2-11: Acres under Williamson Act Contracts

County	Total Acres Reported under Williamson Act	
	2006	2007
Yolo	415,913	416,370
Sutter	57,177	63,022
Sacramento	88,273	88,771
Placer	45,022	42,601
Source: California Department of Conservation 2008.		

Approximately 27 miles of the pipeline would cross 67 parcels listed as active under Williamson Act contracts. Yolo County contains 64 of these parcels. Three areas of land under contract are in non-renewal, and parcels under contract in the Dunnigan Hills are considered non-prime agricultural land. Refer to Figures 4.2-1A, 4.2-1B, and 4.2-1C for the location of Williamson Act parcels near the proposed pipeline. Table 4.2-12 defines the amount of Williamson Act lands that would be included in PG&E's permanent easement.

Table 4.2-12: Williamson Act Contract Lands Included in Permanent Easement

County	Acres
Yolo County (50 ft)[a]	
Prime	92.75
Non-Prime	19.17
Prime - Non-Renewal	11.94
Sutter County (50 ft)[a]	
Prime	3.21
Sacramento County (35 ft)[b]	
Prime	4.12
Total	**131.19**

Notes:
[a] The 50-foot easement covers the length of Lines 406 and 407.
[b] The 35-foot easement covers the length of the DFM.
Source: California Department of Conservation 2007, Michael Brandman Associates 2009.

4.2.2 Regulatory Setting

Federal

There are no Federal regulations related to agricultural resources that are relevant to the Project.

State

Williamson Act Farmlands

The California Land Conservation Act (also known as the Williamson Act) was implemented in 1965 as a mechanism for protecting agricultural and open space land from premature and unnecessary urban development. Under the Williamson Act, private landowners and local government agencies create voluntary, rolling term, 10-year renewable contracts which restrict land use to agricultural and compatible open-space uses. In return, parcels under the Act are assessed for property tax purposes at a rate consistent with their actual use, rather than potential market value. Parcels are defined as either prime or non-prime agricultural land based on the per acre production value.

The California Government Code section 51293(c) specifically allows the location or construction of any public improvement on Williamson Act lands, hence current contracts would not be affected by the Project.

California Government Code, under section 51238, discusses the compatibility of gas pipelines with lands under Williamson Act contract as follows:

> 51238(a) (1) Notwithstanding any determination of compatible uses by the county or city pursuant to this article, unless the board or council after notice and hearing makes a finding to the contrary, the erection, construction, alteration, or maintenance of gas, electric, water, communication, or agricultural laborer housing facilities are hereby determined to be compatible uses within any agricultural preserve. (2) No land occupied by gas, electric, water, communication, or agricultural laborer housing facilities shall be excluded from an agricultural preserve by reason of that use.
>
> (b) The board of supervisors may impose conditions on lands or land uses to be placed within preserves to permit and encourage compatible uses in conformity with section 51238.1, particularly public outdoor recreational uses.

<u>County Designated Compatible Williamson Act Land Uses</u>

Yolo County's Code Article 4 Agricultural Preserve Zone (AP) section 8-2.404 requires a minor use permit for (c) Electrical distribution and transmission substations, communication equipment buildings, and public utility ser1vice yards; and (f) publicly-owned facilities incidental to the supply of essential services by a public entity, such as wastewater treatment ponds, sewage facilities pump station, water supply facilities and pump stations, and solid waste disposal sites; and (i) oil and gas well drilling and operations.

While the Sacramento General Plan does not include specific language regarding the compatible uses in Williamson Act contracted parcels, compatible uses are included within the County's Resolution Establishing Agricultural Preserve's Exhibit B which includes "gas, electric, water, and communication utility facilities."

Both Placer and Sutter counties do not include specific language regarding compatible uses in Williamson Act contracted parcels within their respective General Plans or zoning codes.

Local

The following local regulations and polices have been identified and used in the assessment of Project impacts relating to agricultural resources.

Yolo County General Plan

Approximately 27 miles of the proposed pipeline are located in agricultural areas of Yolo County. Yolo County's General Plan, adopted on July 17, 1983, was reviewed for land use goals, objectives and policies applicable to this Project. The Agricultural Element of the General Plan contains the following goals, objectives, and polices:

> **Goal AG-1:** Conserve and preserve agricultural lands in Yolo County, especially areas currently farmed or having prime agricultural soils and outside existing planned communities and city limits.

> **Policy AP-12:** Agricultural lands shall be protected from urban encroachment by limiting the extension of urban service facilities and infrastructure, particularly sewers.

Sutter County General Plan

The current General Plan for Sutter County was adopted in 1996 and a comprehensive update is currently in progress. Since the proposed pipeline traverses 7.9 miles of mainly agricultural lands in Sutter County, the agricultural element of the County General Plan was reviewed for relevant policies. The following were found to be applicable:

> **Goal 6.A:** To preserve high quality agricultural land for agricultural purposes.

> **Policy 6.A-1:** The County shall preserve agriculturally-designated areas for agricultural uses and direct nonagricultural development to areas designated for urban/suburban growth, or rural communities and/or cities.

> **Policy 6.A-2:** The County shall balance the needs of proposed urban and suburban development with the need to preserve agricultural lands.

Sacramento County General Plan

The DFM extends approximately 1.5 miles into Sacramento County agricultural lands. Sacramento County's General Plan 2010 was adopted on December 15, 1993, and is currently undergoing a comprehensive update. The General Plan was reviewed for land use goals, objectives and policies applicable to this Project. Section I of the Sacramento County Agricultural Element contains the following policies:

> **Goal:** Protect Important Farmland from conversion and encroachment and conserve agricultural resources.

> **Objective:** Prime Farmlands (as defined by the DOC) and lands with intensive agricultural investments (such as orchards, vineyards, dairies, and other concentrated livestock or poultry operations) are protected from urban encroachment.

> **Policy AG-1:** The County shall protect Prime Farmlands and lands with intensive agricultural investments from urban encroachments.

> **Policy AG-5:** Mitigate loss of Prime Farmlands or land with intensive agricultural investments through CEQA requirements to provide in-kind protection of nearby farmland.

Placer County General Plan

Approximately 6 miles of the proposed pipeline are located in semi-rural and agricultural areas of Placer County. The goals, objectives, and policies contained within the 1994 Placer County General Plan were reviewed for Project relevancy. The Agricultural and Forestry Section, and Land Use Section of the General Plan, contain the following policies:

The Agricultural Land Use designation, as described in the Land Use Section contains the following policy:

> **Policy 1.H.2:** The County shall seek to ensure that new development and public works projects do not encourage expansions of urban uses into designated agricultural areas.

> **Policy 1.N.3:** The County shall endeavor to protect the natural resources upon which the County's basic economy e.g., recreation, forestry, agriculture, mining, and tourism, is dependent.

> **Goal 7.A:** To provide for the long-term conservation and use of agriculturally-designated lands.

> **Policy 7.A.1:** The County shall protect agriculturally-designated areas from conversion to non-agricultural uses.

> **Policy 7.A.12:** The County shall actively encourage enrollments of agricultural lands in its Williamson Act program.

4.2.3 Significance Criteria

An adverse impact on agricultural resources is considered significant and would require mitigation if Project construction or operation would:

1. Convert prime agricultural land, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use.
2. Conflict with existing land use plans, policies, or regulations for agricultural use or a Williamson Act contract.
3. Involve other changes in the existing environment that, due to their location or nature, could result in permanent loss of farmland or conversion of farmland to non-agricultural use.

4.2.4 Applicant Proposed Measures

PG&E has not identified any Applicant Proposed Measures (APMs) that are relevant to agricultural resources.

4.2.5 Impact Analysis and Mitigation

The proposed Project has been analyzed for its potential to convert important agricultural land to non-agricultural uses, any conflicts with existing land use zoning that would affect Williamson Act contracted lands, and any other changes to the environment that would result in the conversion of farmland to non-agricultural uses.

Impact Discussion

Conflict with Existing Plans, Policies, Regulations, or Williamson Act Contract

The proposed Project traverses 67 parcels that are currently active under Williamson Act Contacts. California Government Code section 51238 determines the construction, alteration, or maintenance of gas transmitting facilities as compatible uses within any agricultural preserve. Additionally, California Government Code 51293(c) specifically allows the location or construction of any public utility improvement on Williamson Act land if it has been approved by the California Public Utilities Commission (CPUC). As such, current contracts would not be affected by the Project.

All Williamson Act lands disturbed by construction activities would be returned to prior status as agreed upon with the landowner with the exception of certain areas where permanent aboveground stations would be constructed in Williamson Act tracts.

The permanent aboveground stations include the Capay Station and the Yolo Junction Station, which would permanently convert 0.78 acres of Williamson Act lands to non-agricultural uses. The California Government Code section 51293(c) specifically allows the location or construction of any public improvement on Williamson Act lands. In addition, the construction of the aboveground stations would not cause a termination of Williamson Act contracts for the parcels because agricultural practices in all other areas of the parcels would be allowed to resume agricultural production following construction.

Restrictions on land within the permanent easement of Line 406, Line 407, and the DFM would be limited to the planting of deep-rooted vegetation within 15 feet of the pipeline centerline (that is, 30 feet of the permanent easement). The land would not be converted to a non-agricultural use because other types of crops could be planted within the easement.

Therefore, the proposed Project does not conflict with the existing land use plans, policies, and regulations for agricultural use. Impacts would be less than significant (Class III).

Conversion of Agricultural Land to Non-Agricultural Use

Temporary Impacts

As shown in Table 4.2-9, construction of the proposed Project would temporarily utilize approximately 511 acres of farmland within the 100-foot temporary ROW. This farmland would include 265.98 acres of prime farmland, 62.23 acres of farmland of statewide importance, 15.89 acres of unique farmland, 64.47 acres of farmland of local importance, 58.49 acres of farmland of local potential, 22.26 acres of grazing land, and 22.10 acres of other land.

Topsoil and subsoil removed for trenching during Project construction would be stockpiled separately and replaced after backfill of the trench. Soils would be decompacted and reseeded by PG&E in accordance with the landowners' requests. All work areas would be graded and restored to pre-construction contours within 20 days of trench backfilling. Restoration activities would commence within 6 days of final grading. Following installation of the proposed pipeline and subsequent restoration of the topography and topsoil, agricultural production would be permitted within the temporary construction easement. Temporary impacts to agricultural lands would be less than significant (Class III).

Permanent Impacts

Six fenced, aboveground pressure limiting, pressure regulating, metering, and main line valve stations would be constructed along the pipeline route. These stations are required for the proper regulation and maintenance of the pipeline. The six aboveground stations (and their respective acreage) would include the Capay Metering Station (1 acre) located in Farmland of Local Importance; the Yolo Junction Pressure Limiting Station (0.29 acre) located in Prime Farmland; the Powerline Road Main Line Valve (0.02 acre) located in Prime Farmland; the Powerline Road Pressure Regulating Station (0.9 acre) located in Farmland of Local Importance; the Baseline Road Pressure Limiting Station (0.28 acre) located in Farmland of Local Importance; and the Baseline/Brewer Road Main Line Valve Station (0.06 acres) located in Farmland of Local Importance. Refer to Figures 2-3, 2-4, 2-5, 2-6, and 2-7 for the locations of these stations and Figure 2-8 for an example of a typical aboveground station. Installation of these stations would result in the permanent loss of 2.55 acres of farmland.

As shown in Table 4.2-10, approximately 250 acres of farmland would be affected by the Lines 406 and 407 50-foot permanent easement and the 35-foot permanent easement of the DFM. This farmland would include 127.94 acres of prime farmland, 28.92 acres of farmland of statewide importance, 13.81 acres of unique farmland, 53.68 farmland of local importance, 4.82 acres of farmland of local potential, 10.14 acres of grazing land, and 11.53 acres of other land.

Upon completion of construction and restoration of topography, most farming practices would be allowed to resume within the permanent easement. The permanent easement is used for pipeline maintenance and is needed to minimize potential damage and disruption to infrastructure by ground-disturbing activities near the proposed pipeline. Within agricultural lands, the pipeline is proposed to be constructed with 5 feet of soil coverage in order to allow farming activities such as discing or deep-ripping to continue within the entire easement. The EPA defines deep-ripping as the mechanical manipulation of the soil to break up or pierce highly compacted, impermeable or slowly permeable subsurface soil layers occurring at depths greater than 16 inches and, in some cases, exceeding 4 feet below the surface (EPA 1996). As a part of the project, PG&E has increased the cover beyond minimum requirements from 3 feet to 5 feet because its past experience has demonstrated that this depth is sufficient to eliminate most threats from agricultural operations. Excavations in excess of 5 feet present additional construction challenges (and cost) due to the need for trench benching or shoring for worker entry. Maintaining the cover on the pipe at 5 feet would reduce the impact on farming operations if the pipeline must be excavated in the future.

Restrictions within the permanent easement would prohibit the planting of deep rooted plants, such as trees or vines, within 15 feet in either direction of the pipeline centerline (30 feet of the permanent easement) in order to minimize possible disturbances from the deep roots of such vegetation. This would limit the future use of approximately 152.81 acres of farmland to row crops, field crops, or any crops that do not involve deep rooted plants. However, the land would not be converted to non-agricultural uses. The majority of the land within the proposed permanent easement is grassland, row crops or rice fields. These practices could continue within the permanent easement.

Project implementation would result in the permanent conversion of approximately 3.1 acres of existing orchards, as replanting of those trees and other deep-rooted plants, would not be allowed; however, other agricultural practices could still be implemented. Because the majority of the route is currently grassland, row crops or rice fields, no other agricultural areas would experience a change of crop type over existing baseline conditions.

To summarize the above discussion, the amount of farmland that would be permanently converted to non-agricultural use by the construction of the six stations is 2.55 acres. The project would also result in the permanent conversion of approximately 3.1 acres of existing orchards (because of restrictions related to replanting of trees and other deep-rooted plants) to other agricultural practices.

The amount of farmland permanently impacted (2.55 acres), and the amount of farmland converted from deep rooted plants to other types of crops (3.1 acres) does not represent a significant regional loss. Impacts related to the conversion of agricultural land are considered to be less than significant (Class III).

In addition, PG&E would be required to provide financial compensation for temporary and permanent loss of agricultural uses through the California Code of Civil Procedure, as follows:

- Section 1245.030(b) requires compensation for property damage, including crop damage, resulting from pre-construction project studies, testing, surveying, etc.
- Section 1263.210(a) requires all property improvements, including agricultural crops and associated facilities and infrastructure, in project land rights acquisition compensation.
- Section 1263.250(a) requires compensation for crop damage/losses resulting from project construction. It also requires scheduling project construction to avoid impacts to agricultural crops when possible.

4.2.6 Impacts of Alternatives

A No Project Alternative as well as twelve options have been proposed for the alignment in order to minimize environmental impacts of the proposed Project and to respond to comments from nearby landowners. The twelve options, labeled A through L, have been analyzed in comparison to the portion of the proposed route that has been avoided because of the option. Descriptions of the options can be found in Section 3.0, Alternatives and Cumulative Projects, and are depicted in Figures 3-2A through 3-2K. A comparison of impacts is found in Table 4.2-13.

No Project Alternative

Under the No Project Alternative, no new natural gas pipeline or aboveground stations would be constructed by PG&E in Yolo, Sutter, Sacramento, and Placer counties. There would be no restrictions on agricultural land use. No agricultural land would be converted to non-agricultural use and no orchards would be converted to other types of crops. No temporary or permanent impacts to agricultural resources would result under the No Project Alternative.

Option A

Under Option A, Line 406 would follow CR-16, CR-15B and farm roads or parcel boundaries to avoid placing the pipeline within 8 of the 16 agricultural fields that the proposed alignment would cross for Line 406. This option would also avoid removing trees from an orchard at the west end of the proposed alignment. However, vineyards would be impacted with this option, and trees within the orchards near the Sacramento River would still be disturbed. The amount of agricultural land converted to non-agricultural uses (2.55 acres) due to the six aboveground stations would be the same as the proposed alignment with this option. The amount of orchard conversion would be reduced with this option. While agricultural impacts of the proposed Project are considered to be less than significant, the amount of temporary construction impacts to agricultural fields would be increased with this option due to the increased length (an additional 2,200 feet) along agricultural fields. The amount of agricultural land restricted in the permanent easement to allow only shallow rooted crops to be grown would also be increased with this option.

Option B

Under Option B, a portion of Line 406 would follow CR-16 and farm roads or parcel boundaries to avoid segmenting 13 of the 16 agricultural fields that the proposed alignment would cross for Line 406. This option would also avoid removing trees from an orchard at the west end of the proposed alignment. However, trees within the orchards near the Sacramento River would still be disturbed. The amount of agricultural land converted to non-agricultural uses (2.55 acres) due to the six aboveground stations would be the same as the proposed alignment with this option.

The amount of orchard conversion would be reduced with this option. While agricultural impacts of the proposed Project are considered to be less than significant, the amount of temporary construction impacts to agricultural fields would be increased with this option due to the increased length (an additional 2,640 feet) along agricultural fields. The amount of agricultural land restricted in the permanent easement to allow only shallow rooted crops to be grown would also be increased with this option.

Option C

Under Option C, a portion of Line 406 would utilize a section of the Hungry Hollow Canal right-of-way and a farm road (increasing the length of the pipeline by 1,160 feet) to avoid segmenting 3 of the 16 agricultural fields that the proposed alignment would cross for Line 406. This option would also avoid removing trees from an orchard at the west end of the proposed alignment. However, trees within the orchards near the Sacramento River would still be disturbed. The amount of agricultural land converted to non-agricultural uses (2.55 acres) due to the six aboveground stations would be the same as the proposed alignment with this option. Agricultural impacts of the proposed Project are considered to be less than significant. The amount of temporary construction impacts to agricultural fields, the amount of orchard conversion, and the amount of agricultural land restricted in the permanent easement to allow only shallow rooted crops to be grown, would be similar to the proposed project.

Option D

Under Option D, a portion of Line 406 would follow CR-17 and parcel boundaries to avoid segmenting 10 of the 16 agricultural fields that the proposed alignment would cross for Line 406. Trees within the orchards at the west end of the alignment and near the Sacramento River would still be disturbed under this option. The amount of agricultural land converted to non-agricultural uses (2.55 acres) due to the six above-ground stations would be the same as the proposed alignment with this option. Agricultural impacts of the proposed Project are considered to be less than significant. The amount of temporary construction impacts to agricultural fields, the amount of orchard conversion, and the amount of agricultural land restricted in the permanent easement to allow only shallow rooted crops to be grown, would be similar to the proposed project.

Option E

Under Option E, a portion of Line 406 would follow CR-19 and parcel boundaries to avoid segmenting 10 of the 16 agricultural fields that the proposed alignment would cross for Line 406. Trees within the orchards at the west end of the alignment and near the Sacramento River would still be disturbed under this option. The amount of agricultural land converted to non-agricultural uses (2.55 acres) due to the six aboveground stations would be the same as the proposed alignment with this option. Agricultural impacts of the proposed Project are considered to be less than significant. The amount of temporary construction impacts to agricultural fields, the amount of orchard conversion, and the amount of agricultural land restricted in the permanent easement to allow only shallow rooted crops to be grown, would be similar to the proposed project.

Option F

Under Option F, a small portion of Line 406 would be rerouted to avoid placing the pipeline within 30 feet of a residence. Instead of segmenting grazing land, this option would segment an agricultural field with row crops. Trees within the orchards at the west end of the alignment and near the Sacramento River would still be disturbed under this option. The amount of agricultural land converted to non-agricultural uses (2.55 acres) due to the six aboveground stations would be the same as the proposed alignment with this option. Agricultural impacts of the proposed Project are considered to be less than significant. The amount of temporary construction impacts to agricultural fields, the amount of orchard conversion, and the amount of agricultural land restricted in the permanent easement to allow only shallow rooted crops to be grown, would be similar to the proposed Project.

Option G

Under Option G, a small portion of Line 406 would be rerouted to avoid segmenting one agricultural field that the proposed alignment would cross for Line 406. Trees within the orchards at the west end of the alignment and near the Sacramento River would still be disturbed under this option. The amount of agricultural land converted to non-agricultural uses (2.55 acres) due to the six aboveground stations would be the same as the proposed alignment with this option. Agricultural impacts of the proposed Project are considered to be less than significant. The amount of temporary construction impacts to agricultural fields, and the amount of agricultural land restricted in the permanent easement to allow only shallow rooted crops to be grown, would be similar to the proposed project.

Option H

Implementation of Option H, which is a portion of Line 407 and the DFM, would increase disturbance to the Yolo Bypass by increasing the amount of that land crossed by the pipeline. The Yolo Bypass contains prime and unique farmland within the Project and Option H vicinity. Trees within the orchards at the west end of the alignment and near the Sacramento River would still be disturbed under this option. The amount of agricultural land converted to non-agricultural uses (2.55 acres) due to the six aboveground stations would be the same as the proposed alignment with this option. Agricultural impacts of the proposed Project are considered to be less than significant; the amount of temporary construction impacts to agricultural fields, and the amount of agricultural land restricted in the permanent easement to allow only shallow rooted crops to be grown, would be similar to the proposed Project.

Option I

Under Option I, a portion of Line 407-E would be rerouted to the north to place the pipeline outside of a 1,500-foot safety buffer zone around a planned high school to be located on the South side of Baseline Road. Rather than following Base Line Road, the pipeline would cross three agricultural fields and traverse the boundary of a fourth agricultural field. The agricultural crops currently grown in the three fields are rice and row crops, which would be allowed to continue farming once construction of the pipeline is completed. The amount of agricultural land converted to non-agricultural uses (2.55 acres) due to the six aboveground stations would be the same as the proposed alignment with this option. Agricultural impacts of the proposed Project are considered to be less than significant; the amount of temporary construction impacts to agricultural fields, and the amount of agricultural land restricted in the permanent easement to allow only shallow rooted crops to be grown, would be similar to the proposed project.

Option J

Under Option J, a portion of Line 407-E would be rerouted to the north to place the pipeline outside of a 1,500-foot safety buffer zone around a planned high school to be located on the South side of Baseline Road. Rather than following Base Line Road, the pipeline would cross four agricultural fields near their boundary lines. The agricultural crops currently grown in the three fields are rice and row crops, which would be allowed to continue farming once construction of the pipeline is completed. The amount of agricultural land converted to non-agricultural uses (2.55 acres) due to the six aboveground stations would be the same as the proposed alignment with this option. Agricultural impacts of the proposed Project are considered to be less than significant; the amount of temporary construction impacts to agricultural fields, and the amount of agricultural land restricted in the permanent easement to allow only shallow rooted crops to be grown, would be similar to the proposed Project.

Option K

Under Option K, a portion of Line 407-E would be rerouted to the north to place the pipeline outside of a 1,500-foot safety buffer zone around a planned elementary school to be located south of Baseline Road. Rather than following Base Line Road, the pipeline would cross through annual grassland. The amount of agricultural land converted to non-agricultural uses (2.55 acres) due to the six aboveground stations would be the same as the proposed alignment with this option. Agricultural impacts of the proposed Project are considered to be less than significant. This option would not increase the acreage of temporary or permanent impacts; therefore, the impacts to agricultural resources would remain the same as the proposed Project.

Option L

Under Option L, a portion of the proposed Line 406-E HDD would be extended for approximately 1,000 feet to the east along Base Line Road in order to increase the amount of covered pipeline located within a 1,500-foot safety buffer zone around a planned elementary school that is to be located south of Baseline Road. The amount of agricultural land converted to non-agricultural uses (2.55 acres) due to the six above-ground stations would be the same as the proposed alignment with this option. Agricultural impacts of the proposed Project are considered to be less than significant. This option would not increase the acreage of temporary or permanent impacts; therefore, the impacts to agricultural resources would remain the same as the proposed Project.

Table 4.2-13: Comparison of Alternatives for Agricultural Resources

Alternative	Comparison with Proposed Project
No Project	No Impacts

Alternative	Comparison with Proposed Project
Option A	Greater Impacts
Option B	Greater Impacts
Option C	Similar Impacts; less segmenting of fields
Option D	Similar Impacts; less segmenting of fields
Option E	Similar Impacts; less segmenting of fields
Option F	Similar Impacts
Option G	Similar Impacts
Option H	Similar Impacts
Option I	Similar Impacts
Option J	Similar Impacts
Option K	Similar Impacts
Option L	Similar Impacts
Source: Michael Brandman Associates 2009.	

4.2.7 Cumulative Projects Impact Analysis

Other projects within this Project's vicinity that would affect agricultural resources include the Sutter Pointe Specific Plan's several road improvement projects; Placer Vineyards Specific Area Plan and its road improvement projects; the Sierra Vista Specific Plan; the Placer Parkway Corridor Preservation; and the Natomas Levee Improvement Plan. The proposed Project converts only a small amount of farmland to non-agricultural uses. Since the proposed Project would not conflict with existing land use regulations or Williamson Act contracts, or create changes to the environment that would result in a significant loss of farmland, a less than significant cumulative impact would occur to agricultural resources.

4.2.8 Summary of Impacts and Mitigation Measures

The amount of farmland permanently impacted (2.55 acres) and the amount of farmland converted from deep rooted plants to other types of crops (3.1 acres) does not represent a significant regional loss. Therefore, impacts to agricultural resources are considered to be less than significant and no mitigation measures have been proposed.

4.3 AIR QUALITY

This Section describes existing conditions, potential Project-related impacts, and proposed mitigation measures for air quality and climate change issues in the Project area. Included are descriptions of the environmental setting in terms of existing air quality that could be affected by the proposed alignment. Federal, State, and local regulations that could affect the Project construction and operation are discussed followed by discussions of impacts and mitigation measures, organized by each of the significance criteria identified.

4.3.1 Environmental Setting

Regional Air Quality

The proposed Project would be located in the lower Sacramento Valley and traverse Yolo, Sutter, Sacramento, and Placer counties. The pipeline would originate in Yolo County, just west of Yolo County Road (CR) 85, and extend approximately 40 miles east to Placer County, terminating at the intersection of Fiddyment Road and Baseline Road, adjacent to the City of Roseville.

The Project area is located within the Sacramento Valley Air Basin (SVAB), a large north-south oriented valley in Northern California. The SVAB is bounded by the Sierra Nevada Mountains to the east and the North Coast Ranges to the west, and extends from Shasta County to Sacramento County. The SVAB encompasses 11 counties, including Shasta, Tehama, Glenn, Colusa, Yolo, Butte, Yuba, Sutter, and Sacramento County. The SVAB also includes the northeastern half of Solano County and the western portion of Placer County. The SVAB is further divided into two planning areas: the Broader Sacramento Area that consists of the southern (more populated) portion of the SVAB, and the Upper Sacramento Valley. The Project is located in the Broader Sacramento Area portion of the SVAB.

The Project passes through the Yolo/Solano Air Quality Management District (YSAQMD), the Feather River Air Quality Management District (FRAQMD), the Placer County Air Pollution Control District (PCAPCD), and the Sacramento Metropolitan Air Quality Management District (SMAQMD). The local air districts in the Project area are illustrated in Figure 4.3-1.

Topography. The SVAB is generally shaped like a bowl. It is open in the south and is surrounded by mountain ranges on all other sides. The Sierra Nevada Mountains form the eastern border of SVAB, and the Coast Ranges are located along the western boundary of the SVAB.

Meteorology. The lower Sacramento Valley region enjoys a Mediterranean climate with warm, dry summers and cool, mild winters. Summers are generally dry with hot afternoons and mild evening temperatures. Summer temperatures are influenced by the Delta Breeze that generally arrives in the afternoon and serves to moderate maximum temperatures. The rainy season begins in mid November and continues through March. Average annual total precipitation for the area is approximately 19.35 inches with the months of May through October each receiving less than an inch of precipitation (WWRC 2007). Winds prevail from the south and west, with the exception of November and December when winds are from the northwest. Approximate temperatures range from an average minimum of 37.6 degrees Fahrenheit (ºF) in January to an average maximum of 95.8 ºF in July (WWRC 2007).

Dominant Airflow. Dominant airflows provide the driving mechanism for transport and dispersion of air pollution. Summer patterns are dominated by the Delta Breeze that transports cool air inland from the Sacramento-San Joaquin Delta (Delta) south of the SVAB. The arrival and intensity of the Delta Breeze are key factors in air quality of the Sacramento Valley. Alternate flows include dry overland flows from the north end of the SVAB. Another prominent wind flow feature, the "Schultz Eddy," can influence air quality in the Project area. The Schultz Eddy is a counterclockwise circular eddy centered around the Sacramento, Woodland, and Davis area.

Transport. Transport is the term used to describe the flow of air pollutants from one geographic area to another. The Project area is considered both a contributor and recipient of transported air pollutants. The air quality in the Broader Sacramento Area can be impacted by ozone precursors generated in the San Francisco Bay Area, and on occasion, by pollutants transported from the San Joaquin Valley. However, local emissions dominate the inventory of air pollution on hot stagnant summer days. (CARB 2001).

Attainment Status

There are three terms used to describe an air basin that is exceeding or meeting Federal and State standards: Attainment, Nonattainment, and Unclassified. Air basins, or sub-parts of air basins, are assessed for each applicable standard, and receive a designation for each standard based on that assessment. If an ambient air

Source: Adapted from PG&E 2007, California Air Resources Board March 2004, USGS National Elevation Dataset .

Michael Brandman Associates

NORTH

0 2.5 5 10 Miles

Figure 4.3-1
Air Districts in the Project Region

quality standard is exceeded, the area is designated as "nonattainment" for that standard. An area is designated as an "attainment" area for standards that are met. If there is inadequate or inconclusive data to make a definitive attainment designation for an air quality standard, the area is considered "unclassified." Federal nonattainment areas are further divided into classifications—classified as severe, serious, or moderate as a function of deviation from standards. The current attainment designations for the Project area are shown in Table 4.3-1 below.

Table 4.3-1: Attainment Status of Yolo, Sutter, Sacramento, and Placer Counties

Pollutant	Yolo County	Sutter County	Sacramento County	Placer County[1]
Federal				
Ozone (0_3)	Nonattainment	Nonattainment	Nonattainment	Nonattainment
Carbon Monoxide (CO)	Unclassified/ Attainment	Unclassified/ Attainment	Unclassified/ Attainment	Unclassified/ Attainment
Nitrogen Dioxide (NO_2)	Unclassified/ Attainment	Unclassified/ Attainment	Unclassified/ Attainment	Unclassified/ Attainment
Sulfur Dioxide (SO_2)	Unclassified	Unclassified	Unclassified	Unclassified
Particulate Matter (PM_{10})	Unclassified	Unclassified	Nonattainment	Unclassified
Particulate Matter ($PM_{2.5}$)	Unclassified/ Attainment	Unclassified/ Attainment	Unclassified/ Attainment	Unclassified/ Attainment
State				
Ozone (0_3)	Nonattainment	Nonattainment	Nonattainment	Nonattainment
Carbon Monoxide (CO)	Attainment	Attainment	Attainment	Attainment
Nitrogen Dioxide (NO_2)	Attainment	Attainment	Attainment	Attainment
Sulfur Dioxide (SO_2)	Attainment	Attainment	Attainment	Attainment
Particulate Matter (PM_{10})	Nonattainment	Nonattainment	Nonattainment	Nonattainment
Particulate Matter ($PM_{2.5}$)	Unclassified	Unclassified	Nonattainment	Nonattainment

Pollutant	Yolo County	Sutter County	Sacramento County	Placer County[1]

Notes
[1] Placer County is divided between two air basins: the Mountain Counties Air Basin and the Sacramento Valley Air Basin. Attainment status listed in this table represents the portion of Placer County within the Sacramento Valley Air Basin, where the proposed Project is located.
Source: CARB 2008.

The counties in which the Project is located are classified as nonattainment for the Federal 1-hour ozone standard. However, the United States Environmental Protection Agency (EPA) revoked the Federal 1-hour ozone standard on June 15, 2005, replacing it with the more stringent 8-hour ozone standard. However, the local air districts are still subject to continuation of existing 1-hour ozone control strategies.

Under the new Federal 8-hour standard, the counties where the Project is located are classified as serious nonattainment and identified as the Sacramento Federal Nonattainment Area. The Federal 8-hour ozone attainment deadline for the Sacramento Federal Nonattainment Area is June 15, 2013. Additionally, the counties are designated as nonattainment for both the 1-hour and 8-hour State ozone standards.

The counties in which the Project is located are designated as unclassified/attainment under the Federal standards for carbon monoxide (CO). However, portions of Placer County, Sacramento County and Yolo County had previously been nonattainment for the Federal CO standard. The counties have since attained the standard and are listed as maintenance areas for the Federal CO standard. Under State standards the counties are designated as attainment for CO.

Under Federal standards, Yolo, Sutter, and Placer Counties are unclassified for particulate matter (less than 10 microns [PM_{10}]). Sacramento County is currently designated nonattainment of the Federal PM_{10} standard. However, current data shows that Sacramento County has attained the standard although the county will not be redesignated until the EPA officially publishes the county's designation as attainment.

In addition, all the counties are designated nonattainment for the State PM_{10} standard. Sacramento County is designated nonattainment for the State particulate matter (less than 2.5 microns [$PM_{2.5}$]) standard.

Pollutants of Concern

As described above, the Project area is designated nonattainment for the Federal and State 8-hour ozone standards. In addition, the area is nonattainment for the State 1-hour ozone, 24-hour and annual PM_{10}, and annual $PM_{2.5}$ standards. Because the area exceeds these health-based ambient air quality standards, ozone, PM_{10} and $PM_{2.5}$ are the main criteria pollutants of concern for the Project area. In addition, CO is a pollutant of concern due to the localized nature of CO hot spots (see discussion below under Toxic Air Contaminant Regulation). Other pollutants of concern are toxic air contaminants and greenhouse gases (GHGs).

The proposed Project is not expected to produce air emissions containing hydrogen sulfide, sulfates, and vinyl chloride. Therefore, these pollutants will not be discussed.

The emissions sources and potential health effects of the pollutants of concern are described below.

Pollutant Descriptions

Ozone. Ozone is not emitted directly into the air, but is formed by a photochemical reaction in the atmosphere. The ozone precursors reactive organic gases (ROG) and oxides of nitrogen (NO_x) react in the atmosphere in the presence of sunlight to form ozone. Because photochemical reaction rates depend on the intensity of ultraviolet light and air temperature, ozone is primarily a summertime air pollution problem. Often, ozone impacts occur at a distance downwind of the sources of ozone precursors. Therefore, ozone is a regional pollutant. Ground-level ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and can cause substantial damage to vegetation and other materials.

Ozone can irritate lung airways and cause inflammation much like a sunburn. Other symptoms include wheezing, coughing, pain when taking a deep breath, and breathing difficulties during exercise or outdoor activities. People with respiratory problems are most vulnerable, but even healthy people who are active outdoors can be affected when ozone levels are high. Chronic ozone exposure can induce morphological (tissue) changes throughout the respiratory tract, particularly at the junction of the conducting airways and the gas exchange zone in the deep lung. Anyone who spends time outdoors in the summer is at risk, particularly children and other people who are more active outdoors. Even at very low levels, ground-level ozone triggers a variety of health problems, including aggravated asthma, reduced lung capacity, and increased susceptibility to respiratory illnesses like pneumonia and bronchitis.

Ozone also damages vegetation and ecosystems. It leads to reduced agricultural crop and commercial forest yields; reduced growth and survivability of tree seedlings; and increased susceptibility to diseases, pests, and other stresses such as harsh weather. In the United States alone, ozone is responsible for an estimated $500 million in reduced crop production each year. Ozone also damages the foliage of trees and other plants, affecting the landscape of cities, national parks and forests, and recreation areas. In addition, ozone causes damage to buildings, rubber, and some plastics.

Reactive Organic Gases. ROGs, also known as volatile organic compounds (VOCs), are defined as any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, which participate in atmospheric photochemical reactions. ROGs consist of nonmethane hydrocarbons and oxygenated hydrocarbons. Hydrocarbons are organic compounds that contain only hydrogen and carbon atoms. Nonmethane hydrocarbons are hydrocarbons that do not contain the unreactive hydrocarbon methane. Oxygenated hydrocarbons are hydrocarbons with oxygenated functional groups attached.

There are no State or Federal ambient air quality standards for ROGs because they are not classified as criteria pollutants. ROG is regulated, however, because a reduction in ROG emissions reduces certain chemical reactions that contribute to the formulation of ozone. ROGs are also transformed into organic aerosols in the atmosphere, which contribute to higher PM_{10} levels and lower visibility.

Nitrogen Oxides. During combustion of fossil fuels, oxygen reacts with nitrogen to produce nitrogen oxides or NO_x. This occurs primarily in motor vehicle internal combustion engines and fossil fuel-fired electric utility facilities and industrial boilers. The pollutant NO_x is a concern because it is an ozone precursor, which means that it helps form ozone. When NO_x and ROG are released in the atmosphere, they can chemically react with one another in the presence of sunlight and heat to form ozone. NO_x can also be a precursor to PM_{10} and $PM_{2.5}$.

Particulate Matter (PM_{10} and $PM_{2.5}$). Particulate matter (PM) is the term for a mixture of solid particles and liquid droplets found in the air. Some particles, such as dust, dirt, soot, or smoke, are large or dark enough to be seen with the naked eye. Others are so small they can only be detected using an electron microscope.

In discussions of air pollution, particulate matter is typically divided into two size categories: PM_{10} and $PM_{2.5}$ because of the adverse health effects associated with the smaller sized particles. PM_{10} refers to particulate matter that is 10 microns or less in diameter (1 micron is one-millionth of a meter) and is conventionally known as Inhalable Particulate Matter. $PM_{2.5}$ refers to particulate matter that is 2.5 microns or less in diameter and is conventionally known as Fine Particulate Matter. For reference, $PM_{2.5}$ is approximately one-thirtieth the diameter of the average human hair.

These particles come in many sizes and shapes and can consist of hundreds of different chemicals. Some particles, known as primary particles, are emitted directly from a source, such as dust from construction sites, unpaved roads, or fields, and soot or ash from smokestacks or fires. Others form in complicated reactions in the atmosphere from chemicals such as sulfur dioxides and nitrogen oxides that are emitted from sources such as power plants, industrial activity, and automobiles. These particles, known as secondary particles, make up most of the fine particulate pollution in the United States.

Particulate exposure can lead to a variety of health effects. For example, numerous studies link particle levels to increased hospital admissions and emergency room visits—and even to death from heart or lung diseases. Both long- and short-term particle exposures have been linked to health problems. Long-term exposures, such as those experienced by people living for many years in areas with high particle levels, have been associated with problems such as reduced lung function, the development of chronic bronchitis, and even premature death. Short-term exposures to particles (hours or days) can aggravate lung disease, causing asthma attacks and acute bronchitis, and may increase susceptibility to respiratory infections. In people with heart disease, short-term exposures have been linked to heart attacks and arrhythmias. Healthy children and adults have not reported to suffer serious effects from short-term exposures, although they may experience temporary minor irritation when particle levels are elevated.

Carbon Monoxide. CO is a colorless, odorless gas that is formed when carbon in fuel is not burned completely. It is a component of motor vehicle exhaust, which contributes about 56 percent of all CO emissions nationwide. Other non-road engines and vehicles (such as construction equipment and boats) contribute about

22 percent of all CO emissions nationwide. Higher levels of CO generally occur in areas with heavy traffic congestion. In cities, 85 to 95 percent of all CO emissions may come from motor vehicle exhaust. Other sources of CO emissions include industrial processes (such as metals processing and chemical manufacturing), residential woodburning, and natural sources such as forest fires. Woodstoves, gas stoves, cigarette smoke, and unvented gas and kerosene space heaters are sources of CO indoors.

CO is a public health concern because it combines readily with hemoglobin, reducing the amount of oxygen transported in the bloodstream. The health threat from lower levels of CO is most serious for those who suffer from such heart-related diseases as angina, clogged arteries, or congestive heart failure. For a person with heart disease, a single exposure to CO at low levels may cause chest pain and reduce that person's ability to exercise; repeated exposures may contribute to other cardiovascular effects. High levels of CO can affect even healthy people. People who breathe high levels of CO can develop vision problems, reduced ability to work or learn, reduced manual dexterity, and difficulty performing complex tasks. At extremely high levels, CO is poisonous and can be fatal.

Motor vehicles are the dominant source of CO emissions in most areas. CO is described as having only a local influence because it disperses quickly. High CO levels develop primarily during winter because emissions are higher with colder temperatures and low dispersion rates associated with light winds combine with the formation of ground-level temperature inversions (typically from the evening through early morning). High CO concentrations occur in areas of limited geographic size, sometimes referred to as hot spots. Since CO concentrations are strongly associated with motor vehicle emissions, high CO concentrations generally occur in the immediate vicinity of roadways with high traffic volumes and traffic congestion, active parking lots, and in automobile tunnels. Areas adjacent to heavily traveled and congested intersections are particularly susceptible to high CO concentrations.

Toxic Air Contaminants. A toxic air contaminant (TAC) is defined as an air pollutant which may cause or contribute to an increase in mortality or serious illness, or which may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air. However, their high toxicity or health risk may pose a threat to public health even at very low concentrations. In general, for those TACs that may cause cancer, any concentration presents some risk. This contrasts with the criteria pollutants for which acceptable levels of exposure can be determined and for which the State and Federal governments have set ambient air quality standards.

TACs can be emitted from a variety of common sources, including gasoline stations, automobiles, dry cleaners, industrial operations, and painting operations. Natural source emissions include windblown dust and wildfires. Farms, construction sites, and residential areas can also contribute to toxic air emissions. The California Air Resources Board (CARB) has identified the ten TACs that pose the greatest known health risk in California as: acetaldehyde, benzene, 1,3-butadiene, carbon tetrachloride, hexavalent chromium, para-dichlorobenzene, formaldehyde, methylene chloride, perchloroethylene, and diesel particulate matter (diesel PM).

Diesel Particulate Matter. According to the California Almanac of Emissions and Air Quality, the majority of the estimated health risk from TACs can be attributed to relatively few compounds, the most important being particulate matter from diesel-fueled engines (DPM). DPM differs from other TACs in that it is not a single substance, but rather a complex mixture of hundreds of substances. Although DPM is emitted by diesel-fueled internal combustion engines, the composition of the emissions varies depending on engine type, operating conditions, fuel composition, lubricating oil, and whether an emission control system is present. Unlike the other TACs, no ambient monitoring data are available for DPM because no routine measurement method currently exists (CARB 2008b).

The State, after a 10-year research program, determined in 1998 (CARB 1998) that DPM from diesel-fueled engines is a human carcinogen and that chronic (long-term) inhalation exposure to DPM poses a chronic health risk. In addition to increasing the risk of lung cancer, exposure to diesel exhaust can have other health effects as well. Diesel exhaust can irritate the eyes, nose, throat, and lungs, and can cause coughs, headaches, light-headedness, and nausea. Diesel exhaust is a major source of fine particulate pollution as well and studies have linked elevated particle levels in the air to increased hospital admissions, emergency room visits, asthma attacks and premature deaths among those suffering from respiratory problems (CARB 1998).

In California, on-road diesel-fueled vehicles contribute approximately 40 percent of the statewide total of DPM, with an additional 57 percent attributed to other mobile sources such as construction and mining equipment, agricultural equipment, and transport refrigeration units. Stationary sources, contributing about 3 percent of emissions, include shipyards, warehouses, heavy equipment repair yards, and oil and gas production operations. Emissions from these sources are from diesel-fueled internal combustion engines. Stationary sources that report diesel PM emissions also include heavy construction (except highway) manufacturers of asphalt paving materials and blocks, and electrical generation.

In the SVAB, in 2000, the estimated health risk from diesel PM was 360 excess cancer cases per million people. However, the estimated health risk in 2000 is a reduction from the risks estimated for 1990 (CARB 2008b).

Naturally Occurring Asbestos. Naturally occurring asbestos (NOA) is present in certain rock formations such as serpentinite and/or ultramafic rocks. Crushing or breaking these rocks, through construction or other means, can release the asbestos fibers into the air. Rock formations that contain NOA are known to be present in 44 of California's 58 counties. Exposure to asbestos is a health threat; exposure to asbestos fibers may result in health issues such as lung cancer, mesothelioma (a rare cancer of the thin membranes lining the lungs, chest and abdominal cavity), and asbestosis (a non-cancerous lung disease which causes scarring of the lungs).

Greenhouse Gases (GHGs). Gases that trap heat in the atmosphere are GHGs, analogous to the way a greenhouse retains heat. The accumulation of GHGs in the atmosphere regulates the earth's temperature to be suitable for life. However, human activities have increased the amount of GHGs in the atmosphere. Some GHGs can remain in the atmosphere for hundreds of years. The following GHGs are defined under Assembly Bill (AB) 32: carbon dioxide, methane, nitrous oxide, chlorofluorocarbons, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.

The term "global warming potential" is the potential of a gas to contribute to global warming; it is based on a reference scale with carbon dioxide at one. Some pollutants are more potent than carbon dioxide, which is reflected by a higher global warming potential. The following is a brief description of the most common GHGs that may be emitted by the Project.

Carbon Dioxide. Carbon dioxide (CO_2) is an odorless, colorless natural GHG. CO_2 is emitted from natural and anthropogenic (human-caused) sources. Natural sources include the following: decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic sources are from burning coal, oil, natural gas, and wood. CO_2 has a global warming potential of one.

Methane. Methane is a flammable GHG. A natural source of methane is from the anaerobic decay of organic matter. Geological deposits, known as natural gas fields, also contain methane, which is extracted for fuel. Other sources include landfills, fermentation of manure, and ruminants such as cattle. Methane has a global warming potential of 21, meaning that a molecule of methane has 21 times the global warming potential of a molecule of CO_2.

Nitrous Oxide. Nitrous oxide, also known as laughing gas, is a colorless GHG. Nitrous oxide is produced by microbial processes in soil and water, including those reactions that occur in fertilizer containing nitrogen. In addition to agricultural sources, some industrial processes (fossil fuel-fired power plants, nylon production, nitric acid production, and vehicle emissions) also contribute to its atmospheric load. Nitrous oxide is a highly potent GHG with a global warming potential of 310.

Regional Sources of Air Pollutants

According to the CARB's 2008 Almanac of Emissions and Air Quality (CARB 2008b), on-road motor vehicles are the primary source of emissions in Broader Sacramento Area/Sacramento Metropolitan Area, contributing the largest share of NO_X, ROG, and CO. Emissions of ROG, NO_X, and CO have been decreasing since 1990, due to controls on motor vehicle emissions and reductions in evaporative emissions.

The PM_{10} inventory for the SVAB is dominated by areawide sources, primarily by emissions of fugitive dust from paved and unpaved roads, farming operations, construction, and demolition, and particulates from residential fuel combustion. Overall, PM_{10} emissions have been steadily increasing in the SVAB since 1975.

Area-wide sources also contribute the majority of $PM_{2.5}$ emissions in the SVAB, with fugitive dust from paved and unpaved road, construction, and demolition, and particulates from residential fuel combustion and waste burning generating the majority of the inventory. The $PM_{2.5}$ emissions have remained relatively steady from 1975 to 2005, but are estimated to increase slightly between 2005 and 2020.

Local Air Quality

Topography. Topography along the Project area consists of a combination of flat to undulating and rolling hills with corresponding elevations ranging from approximately 15 to 255 feet above mean sea level (msl) (PG&E 2007). The mountains to the east, west, and north enclose the valley and can trap air pollutants and contaminants, elevating ambient concentrations.

Air Monitoring Data. Existing air quality for the Project setting is described using data from the CARB's monitoring stations. The stations described here are located in proximity to the Project site in three of the four counties (Yolo, Sacramento, and

Placer) through which the pipeline traverses. Air monitoring stations within Sutter County are more than 25 miles from the Project area and therefore were not included in this discussion. The most centrally located ambient air monitoring station to the Project area is at 41929 East Gibson Road in Woodland, approximately 5 miles south of the western end of Line 407 West in Yolo County. This station collects data for ozone, $PM_{2.5}$, and PM_{10}. Within Sacramento County, the closest monitoring station to the Project area is the North Highland-Blackfoot Way station located at 7823 Blackfoot Way in North Highlands, approximately 2.7 miles south of the eastern portion of Line 407 East. This station collects data for ozone, PM_{10}, CO, NO_2, and SO_2. Within Placer County, the Roseville North Sunrise Boulevard station is located at 151 North Sunrise Boulevard in Roseville and is approximately 5 miles east of the eastern extent of the Project area. This station collects data for ozone, PM_{10}, $PM_{2.5}$, CO, and NO_2. Table 4.3-2 summarizes the latest published monitoring data for these stations and compares them to California Ambient Air Quality Standards (CAAQS) and National Ambient Air Quality Standards (NAAQS).

Table 4.3-2: Project Area Air Quality Summary - 2005 through 2007

County/Pollutant / Monitoring Station		2005	2006	2007
Ozone - 1 Hour				
Yolo	Max 1 Hour (ppm) Days > CAAQS (0.09 ppm)	0.099 2	0.106 6	0.106 1
Sacramento	Max 1 Hour (ppm) Days > CAAQS (0.09 ppm)	0.103 3	0.135 15	0.109 1
Placer	Max 1 Hour (ppm) Days > CAAQS (0.09 ppm)	0.118 13	0.121 16	0.109 4
Ozone - 8 Hour				
Yolo	Max 8 Hour (ppm)[1] Days > CAAQS (0.07 ppm) Days > NAAQS (0.08 ppm)	0.086 13 2	0.091 23 4	0.078 5 0
Sacramento	Max 8 Hour (ppm)[1] Days > CAAQS (0.07 ppm) Days > NAAQS (0.08 ppm)	0.086 11 2	0.093 42 10	0.096 4 1
Placer	Max 8 Hour (ppm)[1] Days > CAAQS (0.07 ppm) Days > NAAQS (0.08 ppm)	0.106 27 9	0.098 38 9	0.101 20 3

County/Pollutant / Monitoring Station		2005	2006	2007
Particulate Matter (PM_{10})				
Yolo	National Annual Average (µg/m3) Max 24 Hour (µg/m^3)[1] Days > CAAQS (50 µg/m^3) Days > NAAQS (150 µg/m^3)	23.7 66.0 1 0	25.1 78.0 6 0	25.2 119.0 3 0
Sacramento	National Annual Average (µg/m3) Max 24 Hour (µg/m^3)[1] Days > CAAQS (50 µg/m^3) Days > NAAQS (150 µg/m^3)	27.2 109.0 7 0	25.9 67.0 3 0	24.0 59.0 2 0
Placer	National Annual Average (µg/m3) Max 24 Hour (µg/m^3)[1] Days > CAAQS (50 µg/m^3) Days > NAAQS (150 µg/m^3)	19.1 58.0 1 0	22.0 55.0 1 0	17.0 45.0 0 0
Particulate Matter ($PM_{2.5}$) - Annual				
Yolo	National Annual Average (50 µg/m^3)	8.4	9.3	8.3
Placer	National Annual Average (50 µg/m^3)	10.0	10.5	8.4
Particulate Matter ($PM_{2.5}$) - Daily				
Yolo	Max 24 Hour (µg/m^3)[1] Days> NAAQS (35 µg/m^3)	35.0 0	44.0 0	42.0 0
Placer	Max 24 Hour (µg/m3)[1] Days> NAAQS (35 µg/m^3)	59.2 0	54.7 0	48.7 0
Carbon Monoxide				
Sacramento	Max 8 Hour (ppm)[1] Days > CAAQS (20 ppm) Days > NAAQS (35 ppm)	2.86 0 0	2.70 0 0	1.73 0 0
Placer	Max 8 Hour (ppm)[1] Days > CAAQS (20 ppm) Days > NAAQS (35 ppm)	1.27 0 0	* * *	* * *
Nitrogen Dioxide - Annual				
Sacramento	Annual Average (ppm)	0.011	*	0.013
Placer	Annual Average (ppm)	0.013	0.013	0.012
Nitrogen Dioxide - 1 Hour				
Sacramento	Max 1 hour (ppm) Days > CAAQS (0.25 ppm)	0.060 0	0.097 0	0.127 0
Placer	Max 1 hour (ppm) Days > CAAQS (0.25 ppm)	0.079 0	0.063 0	0.058 0

County/Pollutant / Monitoring Station		2005	2006	2007
Sulfur Dioxide				
Sacramento	Max 24 hour (ppm) Days > CAAQS (0.04 ppm) Days > NAAQS (0.14 ppm)	0.002 0 0	0.003 0 0	0.004 0 0

Notes:
*There was insufficient (or no) data available to determine the value.
[1] Measurement statistic based on California approved sampling methods.
> = exceed; ppm = parts per million; $\mu g/m^3$ = micrograms per cubic meter; max = maximum;
CAAQS = California Ambient Air Quality Standard; NAAQS = National Ambient Air Quality Standard.
Yolo = Woodland-Gibson Road air monitoring station.
Sacramento = North Highland-Blackfoot Way air monitoring station.
Placer = Roseville-North Sunrise Boulevard air monitoring station.
Source: CARB 2008.

Local Sources of Air Pollutants

Land use along the Project area is predominantly agriculture and rural residences. Agriculture operations contribute fugitive dust emissions from field activities and unpaved roads. Major roadways that intersect the Project alignment include Interstate (I) 5, I-505, State Route (SR) 113, and SR-99/70. The Sacramento Metropolitan Airport is located approximately 1.49 miles south of the Powerline Road Distribution Feeder Main (DFM).

Sensitive Receptors

Those who are sensitive to air pollution include children, the elderly, and persons with preexisting respiratory or cardiovascular illness. For purposes of CEQA, the CARB considers a sensitive receptor to be a location that houses or attracts children, the elderly, people with illnesses, or others who are especially sensitive to the effects of air pollutants. Examples of sensitive receptors include hospitals, residences, convalescent facilities, schools, and parks. No hospitals or convalescent facilities are located within 1 mile of the Project area.

Yolo County contains the largest section of the pipeline, which would pass within close proximity (0.5 mile) to multiple individual rural residences disbursed throughout the length of the Yolo County section. Of specific note are the clusters of approximately 10 rural residences in the Hungry Hollow area located on CR-17 between CR-87 and CR-88A; approximately 6 rural residences in the Dunnigan Hills area; and approximately 15 rural residences northeast of the unincorporated community of Yolo.

Within Sutter County, there are approximately 10 rural residences on Riego Road (along which the pipeline would travel) between the Sacramento River and Natomas Road. Further east on Riego Road, between Natomas Road and the Sutter/Placer county boundary, there is an area of multiple semi-rural residences.

Within Sacramento County, there are no sensitive receptors located within 0.5 mile of the Powerline Road DFM portion of the pipeline.

Within Placer County, there are approximately 24 residences along Baseline Road within 0.5 mile of the proposed pipeline route. The pipeline's eastern terminus is located adjacent to areas consisting of suburban residences within the City of Roseville limits. Additionally, Coyote Ridge Elementary School, located at 1751 Morningstar Drive in Roseville is located less than 0.5 mile from the pipeline's eastern end.

Greenhouse Gas Emissions and Climate Change

Greenhouse gases play a critical role in the earth's radiation budget by trapping infrared radiation emitted from the earth's surface, which would otherwise have escaped into space. Prominent GHGs contributing to this process include CO_2, CH_4, ozone, water vapor, N_2O, and chlorofluorocarbons (CFCs). This phenomenon, known as the "Greenhouse Effect," is responsible for maintaining a habitable climate. Anthropogenic emissions of these GHGs in excess of natural ambient concentrations are responsible for the enhancement of the Greenhouse Effect and have led to a trend of unnatural warming of the earth's natural climate, known as global warming or climate change. Emissions of these gases that induce global warming are attributable to human activities associated with industrial/ manufacturing, utilities, transportation, residential, and agricultural sectors (CEC 2006). Transportation is responsible for 41 percent of the state's GHG emissions, followed by electricity generation (CEC 2006). Emissions of CO_2 and NO_X are by-products of fossil fuel combustion. Methane, a potent GHG, results from off-gassing associated with agricultural practices and landfills. Sinks of CO_2 include uptake by vegetation and dissolution into the ocean.

Global warming is a global problem, and GHGs are global pollutants, unlike ozone, carbon dioxide, particulate matter, and TACs, which are pollutants of regional and local concern. Worldwide, California is the 12th to 16th largest emitter of CO_2 and is responsible for approximately 2 percent of the world's CO_2 emissions (CEC 2006).

In 2004, California produced 497 million gross metric tons of carbon dioxide-equivalent (CARB 2007b).

Potential Environmental Effects

Worldwide, average temperatures are likely to increase by 1.8 degrees Celsius (°C) to 4 °C, or approximately 3 °F to 7 °F by the end of the 21st Century (IPCC 2007). However, a global temperature increase does not translate to a uniform increase in temperature in all locations on the earth. Regional climate changes are dependant on multiple variables, such as topography. One region of the earth may experience increased temperature, increased incidents of drought and similar warming effects, whereas another region may experience a relative cooling. According to the Intergovernmental Panel on Climate Change's (IPCC) Working Group II Report (IPCC 2007b), climate change impacts to North America may include: diminishing snowpack; increasing evaporation; exacerbation of shoreline erosion; exacerbation of inundation from sea level rising; increased risk and frequency of wildfire; increased risk of insect outbreaks; increased experiences of heat waves; and rearrangement of ecosystems as species and ecosystems shift northward and to higher elevations.

For California, climate change has the potential to incur/exacerbate the following environmental impacts (CAT 2006):

<u>Air Pollution</u>

- Increased frequency, duration, and intensity of conditions conducive to air pollution formation (particularly ozone).

<u>Water Resources</u>

- Reduced precipitation;
- Changes to precipitation and runoff patterns;
- Reduced snowfall (precipitation occurring as rain instead of snow);
- Earlier snowmelt;
- Decreased snowpack;
- Increased agricultural demand for water; and

- Intrusion of seawater into coastal aquifers.

Agricultural Impacts

- Increased growing season; and
- Increased growth rates of weeds, insect pests, and pathogens.

Coastal Impacts

- Inundation by sea level rise.

Forests and Natural Landscapes Impacts;

- Increased incidents and severity of wildfire events; and
- Expansion of the range and increased frequency of pest outbreaks.

Although certain environmental effects are widely accepted to be a potential hazard to certain locations, such as rising sea level for low-laying coastal areas, it is currently infeasible to predict all environmental effects of climate change on any one location.

4.3.2 Regulatory Setting

Air pollutants are regulated at the Federal, State, and air basin level; each agency has a different degree of control. The EPA regulates at the national level. The CARB regulates at the State level. The YSAQMD, SMAQMD, PCAPCD, and FRAQMD regulate air quality in the four counties spanned by the Project.

Federal

The EPA handles global, international, national, and interstate air pollution issues and policies. The EPA provides research and guidance in air pollution programs, and sets NAAQS, also known as Federal standards. There are NAAQS for six common air pollutants, called criteria air pollutants, which were identified resulting from provisions of the Clean Air Act of 1970 (CAA). Criteria air pollutants include ozone, particulate matter (both PM_{10} and $PM_{2.5}$), NO, CO, lead and SO_2.

The NAAQS were set to protect public health, including that of sensitive individuals; thus, the standards continue to change as more medical research is available regarding the health effects of the criteria pollutants.

The EPA also sets national vehicle and stationary source emission standards, oversees approval of all State Implementation Plans (SIP). Under direction of the EPA, a State with Federal nonattainment areas is required to prepare and submit a SIP. The SIP integrates Federal, State, and local plan components and regulations to identify a combination of performance standards and market-based programs specific measures that will enable nonattainment areas to reduce pollution and attain Federal standards.

Table 4.3-3 shows both the California and Federal ambient air quality standards and presents the effects and sources of each pollutant.

State

The CARB has overall responsibility for statewide air quality maintenance and air pollution prevention. The SIP for the State of California is administered by the CARB. The SIP describes existing air quality conditions and measures that will be followed to attain and maintain the NAAQS. The SIP incorporates the individual plans for regional Air Districts that are Federal nonattainment areas. Regional air quality attainment plans prepared by individual regional Air Districts are sent to the CARB to be approved and incorporated into the California SIP. SIPs include the technical foundation for understanding the air quality (e.g. emission inventories and air quality monitoring), control measures and strategies, and enforcement mechanisms. The CARB also administers CAAQS, or State standards, for the ten air pollutants designated in the California Clean Air Act (CCAA). The ten state air pollutants are the six national criteria pollutants plus visibility reducing particulates, hydrogen sulfide, sulfates, and vinyl chloride.

The CARB is a part of the California Environmental Protection Agency. In addition to the development of California's SIP, the ARB is responsible for the coordination and administration of both Federal and State air pollution control programs in California. The CARB conducts research, sets the CAAQS, compiles emission inventories, develops suggested control measures, and provides oversight of local programs. Emission standards for motor vehicles sold in California, other consumer products (such as hairspray, aerosol paints, and barbecue lighter fluid), and various types of commercial equipment are all monitored by the CARB. Fuel specifications intended to further reduce vehicular emissions are also set by the CARB.

Table 4.3-3: State and Federal Criteria Air Pollutant Standards, Effects, and Sources

Air Pollutant	Averaging Time	California Standard	Federal Standard	Pollutant Health and Atmospheric Effects
Ozone (O_3)	1 Hour	0.09 ppm	—	(a) Decrease of pulmonary function and localized lung edema in humans and animals; (b) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (c) Increased mortality risk; (d) Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (e) Vegetation damage; (f) Property damage.
	8 Hour	0.070 ppm	0.075 ppm	
Carbon Monoxide (CO)	1 Hour	20 ppm	35 ppm	(a) Aggravation of angina pectoris (chest pain or discomfort) and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; (d) Possible increased risk to fetuses.
	8 Hour	9.0 ppm	9 ppm	
Nitrogen Dioxide (NO_2)	1 Hour	0.18 ppm	—	a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; (c) Contribution to atmospheric discoloration.
	Annual Mean	0.030 ppm	0.053 ppm	

Air Pollutant	Averaging Time	California Standard	Federal Standard	Pollutant Health and Atmospheric Effects
Sulfur Dioxide (SO_2)	1 Hour	0.25 ppm	—	Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma.
	24 Hour	0.04 ppm	0.14 ppm	
	Annual Mean	—	0.030 ppm	
Particulate Matter (PM_{10})	24 Hour	50 µg/m^3	150 µg/m^3	(a) Exacerbation of symptoms in sensitive patients with respiratory or cardiovascular disease; (b) Declines in pulmonary function growth in children; (c) Increased risk of premature death from heart or lung diseases in the elderly.
	Annual Mean	20 µg/m^3	—	
Particulate Matter ($PM_{2.5}$)	24 Hour	—	35 µg/m^3 [2]	
	Annual Mean	12 µg/m^3	15.0 µg/m^3	
Lead[1]	30-day	1.5 µg/m^3	—	(a) Learning disabilities; (b) impairment of blood formation and nerve conduction.
	Quarter	—	1.5 µg/m^3	
Visibility Reducing Particles	8 Hour	Extinction coefficient of 0.23 per kilometer; visibility of ten miles or more (0.07 to 30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent.	—	(a) Visibility impairment

Air Pollutant	Averaging Time	California Standard	Federal Standard	Pollutant Health and Atmospheric Effects
Sulfates	24 Hour	25 µg/m^3	—	(a) Decreased ventilatory function; (b) Aggravation of asthmatic symptoms; (c) Increased risk of cardio-pulmonary disease; (d) Damage to materials, property, and ecosystems
Hydrogen Sulfide (H_2S)	1 hour	0.03 ppm	—	(a) Exposure to a very disagreeable odor.
Vinyl Chloride[1]	24 Hour	0.01 ppm	—	(a) Central nervous system effects, such as dizziness, drowsiness and headaches; (b) Liver damage; (c) Increased risk of angiosarcoma, a form of liver cancer.

Notes:
[1]. The CARB has identified lead and vinyl chloride as TACs with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.
Abbreviations:
ppm = parts per million (concentration)
µg/m^3 = micrograms per cubic meter
Annual Mean = Annual Arithmetic Mean
30-day = 30-day average
Quarter = Calendar quarter
Source: CARB 2007a. EPA 2008.

Recent Air Quality Standards

In 2006, EPA tightened the 24-hour $PM_{2.5}$ standard from 65 micrograms per cubic meter (µg/m^3) to 35 µg/m^3 and retained the existing annual standard of 15.0 µg/m^3. The EPA promulgated a new 8-hour standard for ozone on March 12, 2008, effective March 27, 2008. In addition, the EPA is proposing to revise the lead standard to within the range of 0.10 µg/m^3 to 0.30 µg/m^3, and it is currently holding public hearings and accepting comments.

The State nitrogen dioxide standard was amended on February 22, 2007. These changes became effective March 20, 2008.

Toxic Air Contaminant Regulation

Regulation of TACs is achieved through Federal and State controls on individual sources. The Federal CAA Amendments offer a comprehensive plan for achieving significant reduction in both mobile- and stationary-source emissions of certain designated Hazardous Air Pollutants (HAP). All major stationary sources of designated HAPs are required to obtain and pay the required fees for an operating permit under Title V of the Federal CAA Amendments.

The California legislature enacted the Toxic Air Contaminant Identification and Control Act (AB 1807, Tanner 1983) governing the release of TACs into the air. This law charges the CARB with the responsibility for identifying substances as TACs, setting priorities for control, adopting control strategies, and promoting alternative processes. The CARB has designated almost 200 compounds as TACs. In addition, the CARB compiles a statewide TACs inventory, oversees exposure notifications, and requires facility plans under the Air Toxics "Hot Spots" Information and Assessment Act (AB 2588, Connelly 1987), which supplements AB 1807. The Hot Spots Act was amended in 1992, and now requires facilities that pose a significant health risk to nearby communities to reduce their risk through a risk management plan.

As stated in the pollutant descriptions above, the CARB has identified the ten TACs that pose the greatest known health risk in California as: acetaldehyde, benzene, 1,3-butadiene, carbon tetrachloride, hexavalent chromium, para-dichlorobenzene, formaldehyde, methylene chloride, perchloroethylene, and DPM.

In July 2001, the ARB approved an Air Toxic Control Measure (ATCM) for construction, grading, quarrying, and surface mining operations to minimize naturally occurring asbestos emissions. The regulation requires application of Best Management Practices (BMPs) to control fugitive dust in areas known to have naturally occurring asbestos, as well as requires notification to the local air district prior to commencement of ground-disturbing activities.

Air Quality and Land Use Handbooks

The ARB adopted the Air Quality and Land Use Handbook: A Community Health Perspective (Land Use Handbook). The Land Use Handbook provides information and guidance on siting sensitive receptors in relation to sources of TACs. The sources of TACs identified in the Land Use Handbook are high traffic freeways and roads, distribution centers, rail yards, ports, refineries, chrome plating facilities, dry cleaners, and large gas dispensing facilities. If the Project involves siting a sensitive receptor or source of TAC discussed in the Land Use Handbook, siting mitigation may be added to avoid potential land use conflicts, thereby reducing the potential for health impacts to the sensitive receptors.

Local

Air Districts

Local air quality and air pollution management districts are responsible for developing rules that regulate stationary sources, area sources, and certain mobile sources. In addition, they establish permitting requirements for stationary sources, enforce air quality rules, and maintain air quality monitoring stations in their respective jurisdictions. The air districts are responsible for developing and updating the State attainment plans and triennial assessments. In addition, the FRAQMD, SCAQMD, YSAQMD, and PCAPCD work in conjunction with each other and the Sacramento Area Council of Governments (SACOG), in developing, updating, and implementing the Federal SIP for the Sacramento Metropolitan Area. The SACOG is an association of local governments in the six-county Sacramento Region, including agencies from or located in El Dorado, Placer, Sacramento, Sutter, Yolo, and Yuba counties.

The SMAQMD, the FRAQMD and the YSAQMD have adopted CEQA guidance documents for their respective jurisdictions. The CEQA guidance documents provide recommended methodologies and thresholds to help assess a project's potential for significant air quality impacts in the framework of CEQA. These guidance documents also provide screening criteria, and recommended measures to reduce significant impacts. The applicable air district CEQA guides for the Project area are:

- SMAQMD - Guide to Air Quality Assessment in Sacramento County. July 2004;
- FRAQMD - Indirect Source Review Guidelines. 1998; and
- YSAQMD - Handbook for Assessing and Mitigating Air Quality Impacts. July 2007.

Federal Air Quality Attainment Plans

The Federal nonattainment plan for the Sacramento Federal Nonattainment Area is the 1994 Sacramento Area Regional Ozone Attainment Plan. The five air districts that comprise the Sacramento Federal Nonattainment area are the SMAQMD, FRAQMD, PCAPCD, YSAQMD, and the El Dorado County AQMD. The air districts of the Sacramento region adopted a Rate of Progress (ROP) Plan for the Federal 8-hour ozone standard in 2006.

In addition, the districts adopted the 2011 Reasonable Further Progress Plan (RFP) for the 8-hour Federal ozone standard in April 2008. The RFP shows that the Sacramento region cannot meet the 2013 attainment deadline, and is the basis for the voluntary Federal reclassification request, discussed further below.

Public workshops for the draft 8-hour Attainment Demonstration Plan were held in September 2008 and it is expected that the draft plan will go to the air districts' respective Board of Directors for adoption in early 2009.

Concerning the Federal PM standards, the SMAQMD published a staff report November 2007, entitled the 2006 PM2.5 Standard: Evaluating the Nine Factors in Setting Nonattainment Area Boundaries for the Sacramento Region. The staff report evaluated ambient air quality monitoring results, population growth, traffic and commuting, and other metrics for the Sacramento Region. The EPA is expected to issue a final decision for Federal $PM_{2.5}$ nonattainment boundaries by December 2008. If an area is designated nonattainment, an attainment plan must be submitted not later than 3 years after the effective date of the designation.

State Air Quality Attainment Plans

The CCAA does not contain planning requirements for areas in nonattainment of the State PM_{10} standards, but air districts must demonstrate to the CARB that all feasible measures for their district have been adopted.

However, State ozone standards do have planning requirements. The CCAA requires air districts that are nonattainment of the State ozone standards to adopt air quality attainment plans and to review and revise their plans to address deficiencies in interim measures of progress once every three years. Each air district's State plans are discussed in the district-specific sections below.

Voluntary Federal Reclassification Request

The five air districts that comprise the Sacramento Federal Nonattainment Area requested the CARB to submit a formal request to the EPA to reclassify the area from "serious" to "severe" nonattainment for the Federal 8-hour ozone standard. The request is based on an evaluation of the emission reductions necessary to attain the Federal standard, and the emission reductions associated with feasible rules. It was determined that the Sacramento Federal Nonattainment Area would not be able to achieve the necessary emission reduction in the attainment timeframe through the existing suite of feasible rules. The CARB submitted the request on February 14, 2008.

Air District Regulations

Air districts develop rules to control the emissions of air pollutants from various sources within their boundaries. Compliance with applicable air district rules is a requirement. Some rules affect the Project indirectly, such as rules that regulate the products that may be used during construction. Other rules affect the Project directly, primarily through requiring emission rate limits and visibility limits on particulate matter emissions during construction and other earth-disturbing activities. The air districts have promulgated a series of rules that, if not identical in language, are similar in purpose and requirements. These similar rules are listed in this Section. Additional air district rules are listed below in the air district-specific sections.

Darkness/Opacity Based Rules. These rules place limits on visible emissions of any air contaminant based on the Ringelmann Chart. All four districts place the limit at a shade as dark or darker than a Ringelmann Chart Number (described for each district below), as published by the United States Bureau of Mines, or of such opacity to obscure an observer's view to a degree equal to or greater than does smoke that is at or darker than Ringelmann Chart No. 2.

- **YSAQMD - Rule 2.3** (Ringelmann Chart), Ringelmann Chart No. 2;
- **SMAQMD - Rule 401** (Ringelmann Chart), Ringelmann Chart No. 1;
- **FRAQMD - Rule 3.0** (Visible Emissions), Ringelmann Chart No. 2; and
- **PCAPCD - Rule 202** (Visible Emissions), Ringelmann Chart No. 1.

Emissions Rate Based Rules. These rules limit the quantity of PM in the atmosphere through establishment of an emission concentration limit. The emission rates in each district's respective rules are listed below.

- **YSAQMD - Rule 2.11** (Particulate Matter), 0.3 grains per cubic foot;
- **SMAQMD - Rule 404** (Particulate Matter), 0.1 grains per cubic foot;
- **FRAQMD - Rule 3.2** (Particulate Matter Concentration), 0.3 grains per cubic foot; and

- **PCAPCD - Rule 207** (Particulate Matter), 0.1 grains per cubic foot.

Nuisance Rules. The YSAQMD, SMAQMD, and PCAPCD adopted rules that incorporate the nuisance language of the California Health and Safety Code section 41700, which states:

> A person shall not discharge from any source whatsoever such quantities of air contaminants or other materials which cause injury, detriment, nuisance or annoyance to any considerable number of persons or the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause or have natural tendency to cause injury or damage to business or property.

- **YSAQMD - Rule 2.5** (Nuisance);
- **SMAQMD - Rule 402** (Nuisance); and
- **PCAPCD - Rule 205** (Nuisance).

Reasonable Precaution Rules. Both the SMAQMD and the FRAQMD have dust control rules that require persons to take “every reasonable precaution” to prevent fugitive dust from being airborne beyond the property line from which the dust originated.

- **SMAQMD - Rule 403** (Fugitive Dust); and
- **FRAQMD - Rule 3.16** (Fugitive Dust Emissions).

Yolo-Solano Air Quality Management District

The YSAQMD’s plan for attaining the State ozone standard is the 1992 Air Quality Attainment Plan (AQAP), which was updated most recently in 2003. The following YSAQMD rules are applicable to the Project directly, and compliance is required:

- **Rule 2.12 Specific Contaminants.** A person shall not discharge into the atmosphere from any single source of emission whatsoever, any one or more of the following contaminants, in any State or combination thereof, in excess of the following concentrations at the point of discharge: (a) Sulfur compounds calculated as sulfur dioxide (SO2) O.2 percent, by volume at standard conditions, (b) Particulate Matter Combustion Contaminants: 0.3 grains per cubic foot of gas calculated to 12 percent of carbon dioxide (CO_2) at standard conditions, except during the start of an operation or change in energy source, during the time necessary to bring the combustion process up to operating level. In measuring the combustion contaminants from incinerators used to dispose of combustible refuse by burning, the carbon dioxide (CO_2) produced by combustion of any liquid or gaseous fuels shall be excluded from the calculation to 12 percent of carbon dioxide (CO_2); and

- **Rule 2.23 - Fugitive Hydrocarbon Emissions.** The purpose of this rule is to control fugitive emissions of hydrocarbons from oil and gas production and processing facilities, refineries, chemical plants, gasoline terminals, and pipeline transfer stations in conformance with RACT determinations approved by the CARB to meet the requirements of the CCAA. The rule contains inspection requirements, time frames for repair of leaks based on leak volume, monitoring and recordkeeping requirements.

Sacramento Metropolitan Air Quality Management District

The SMAQMD is currently under the 1991 AQAP which was developed to address Sacramento County's nonattainment status for State ozone and CO standards, and, although not required, PM_{10} standards. The SMAQMD's 2003 Triennial Report was adopted on April 28, 2005 and the 2006 Annual Progress Report was adopted on October 25, 2007.

In addition, if a construction project is within an area containing NOA, the project must submit a Dust Mitigation Plan or Geologic Evaluation to the SMAQMD prior to receiving a grading permit.

Feather River Air Quality Management District

The southern portion of Sutter County is in the Sacramento Federal Nonattainment Area, as discussed above, and abides by the 1994 Sacramento Area Regional Ozone Attainment Plan. The FRAQMD is also part of the Northern Sacramento Valley Planning Area. The Northern Sacramento Valley Air Basin California 2006 Air Quality Attainment Plan was prepared to comply with the CCAA planning requirements. However, Federal and State plans adopted for the Northern Sacramento Valley Air Basin do not apply to the Project, as the Project is not in the Northern Sacramento Valley Air Basin.

Placer County Air Pollution Control District

There are no additional plans or rules specific to the PCAPCD beyond those discussed above.

Counties

Yolo County

The Yolo County General Plan includes goals and policies that improve air quality, primarily through transportation, transit, and bicycle infrastructure. The Conservation Element contains an air-specific policy, CON 15, which includes interagency coordination, transportation and land use language, and measures to improve waste collection and disposal, among other measures. However, there are no policies directly applicable to the Project.

Yolo County committed to participating in the Cool Counties Climate Stabilization Declaration in September 2007, with a goal of reducing GHG emissions by 80 percent by the year 2050. Yolo County is also a member of the California Climate Action Registry (CCAR). Under the CCAR, Yolo County is required to establish baseline energy usage, and annual reporting to document reduction in usage. The County has a series of example actions and programs on the County's website that illustrate how Yolo County organizations are increasing energy efficiency. More can be found at www.yolocounty.org. The following Yolo County measure is currently under development and would be applicable to the Project:

- A Construction and Demolition (C&D) recycling ordinance to require 50 percent of construction and demolition debris be recycled and diverted from land filling.

Sutter County

Within the Sutter County General Plan, goals and policies are identified to improve the air quality in Sutter County. Similar to the Yolo County General Plan discussed above, there are measures that improve air quality through transportation, transit, and bicycle infrastructure. The Conservation/Open Space - Natural Resources Element contains two goals specific to air quality—Goal 4.I and Goal 4.J. The two policies provided for Goal 4.I relate to coordination with the FRAQMD, whereas Goal 4.J and its related policy pertain to the land use and transportation planning process.

Sacramento County

The Sacramento County General Plan contains an Air Quality Element, with the following applicable policies:

- **AQ-5:** Require the use of Best Available Control Technology (BACT) to reduce air pollution emissions.

In addition, Sacramento County is a member of the CCAR and the International Council for Local Environmental Initiatives (ICLEI), and is currently preparing a climate action plan. The administrative draft of the Greenhouse Gas Emission Inventory for Sacramento County - Unincorporated Areas, published January 2008, used ICLEI's Clean Air and Climate Protection software to estimate the GHG emissions.

Placer County

The Placer County General Plan also contains air-specific goals designed to improve air quality. Goal 6.F is to protect and improve air quality in Placer County. The policies listed under Goal 6.F include measures for interagency coordination, and review and modification of projects to reduce air quality impacts.

- **Goal 6.F.6:** The County shall require project-level environmental review to include identification of potential air quality impacts and designation of design and other appropriate mitigation measures or offset fees to reduce impacts. The County shall dedicate staff to work with project proponents and other agencies in identifying, ensuring the implementation of, and monitoring the success of mitigation measures;

- **Goal 6.F.8:** The County shall submit development proposals to the PCAPCD for review and comment in compliance with CEQA prior to consideration by the appropriate decision-making body; and

- **Goal 6.F.10:** The County may require new development projects to submit an air quality analysis for review and approval. Based on this analysis, the County shall require appropriate mitigation measures consistent with the PCAPCD's 1991 Air Quality Attainment Plan (or updated edition).

City of Roseville

- Project construction would take place within the City of Roseville's sphere of influence but outside of the City limits. Roseville does not have jurisdiction over areas within its sphere of influence. However, Roseville and Placer County maintain a City/County Memorandum of Understanding that ensures development proposed within the City's sphere of influence is planned for cooperatively, through input from both agencies (City of Roseville 2004). The City/County Memorandum of Understanding identifies that any environmental impacts must be mitigated to a level of less than significant unless both Placer County and Roseville agree that specific overriding considerations render such mitigation measures infeasible.

Climate Change

Federal

After a thorough scientific review ordered in 2007 by the U.S. Supreme Court, the U.S. Environmental Protection Agency (EPA) issued a proposed finding on April 17, 2009, that greenhouse gases contribute to air pollution that may endanger public health or welfare. The EPA announced that it may regulate carbon dioxide and other greenhouse gases under the Clean Air Act. The proposed endangerment finding now enters the public comment period, which is the next step in the deliberative process EPA must undertake before issuing final findings. Before taking any steps to reduce greenhouse gases under the Clean Air Act, EPA would conduct an appropriate process and consider stakeholder input.

State

There has been significant legislative activity regarding global climate change and GHGs in California. Although it was not originally intended to reduce GHGs, California Code of Regulations Title 24 Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings, was first adopted in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. The latest amendments were made in October 2005 and currently require new homes to use half the energy they used only a decade ago. Energy efficient buildings require less electricity, and electricity production by fossil fuels results in GHG emissions. Therefore, increased energy efficiency results in decreased GHG emissions.

California Assembly Bill 1493 (Pavley), enacted on July 22, 2002, required the CARB to develop and adopt regulations that reduce GHGs emitted by passenger vehicles and light duty trucks. Regulations adopted by the CARB would apply to 2009 and later model year vehicles. The CARB estimates that the regulation would reduce climate change emissions from the light-duty passenger vehicle fleet by an estimated 18 percent in 2020 and by 27 percent in 2030.

California Governor Arnold Schwarzenegger announced on June 1, 2005, through Executive Order S 3-05, the following GHG emission reduction targets:

1. By 2010, reduce GHG emissions to 2000 levels;
2. By 2020, reduce GHG emissions to 1990 levels; and
3. By 2050, reduce GHG emissions to 80 percent below 1990 levels.

<u>Climate Action Team</u>

To meet these targets, the Governor directed the Secretary of the Cal EPA to lead a Climate Action Team (CAT) made up of representatives from the Business, Transportation and Housing Agency; the Department of Food and Agriculture; the Resources Agency; the Air Resources Board; the Energy Commission; and the Public Utilities Commission. The CAT's Report to the Governor in 2006 contains recommendations and strategies to help ensure the targets in Executive Order S-3-05 are met.

The 2006 CAT Report contains baseline emissions as estimated by the CARB and the California Energy Commission. The emission reduction strategies reduce GHG emissions to the targets contained in AB 32; the 2006 CAT Report is consistent with AB 32.

<u>AB 32</u>

Also in 2006, the California State Legislature adopted AB 32, the California Global Warming Solutions Act of 2006, which charged the CARB to develop regulations on how the state would address global climate change. AB 32 focuses on reducing GHG emissions in California. Greenhouse gases, as defined under AB 32, include carbon dioxide, methane, nitrous oxide, HFCs, PFCs, and sulfur hexafluoride (SF_6). AB 32 requires that GHGs emitted in California be reduced to 1990 levels by the year 2020. The CARB is the state agency charged with monitoring and regulating sources of emissions of GHGs that cause global warming in order to reduce emissions of GHGs, and AB 32 contains several specific requirements for the CARB. Among other measures, AB 32 requires that:

- The CARB determine what the statewide GHG emissions level was in 1990, and it must approve a statewide GHG emissions limit so it may be applied to the 2020 benchmark. The CARB adopted the 1990 GHG emission inventory/2020 emissions limit of 427 million metric tons of carbon dioxide equivalent ($MMTCO_2e$) on December 6, 2007; and
- The CARB must ensure that early voluntary reductions receive appropriate credit in the implementation of AB 32. In February 2008, the CARB approved a policy statement that established a procedure for project proponents to submit voluntary reduction assessment methods to the CARB for evaluation.

The CARB approved the Climate Change Proposed Scoping Plan (Proposed Scoping Plan) on December 11, 2008. The Scoping Plan describes the recommended State actions and strategies needed to achieve the 2020 GHG emissions limit. The CARB plans to develop strategies to implement all of the recommended measures that must be in place by 2012.

SB 97

SB 97 was passed in August 2007. SB 97 indicates that section 21083.05 will be added to the Public Resources Code, "(a) On or before July 1, 2009, the Office of Planning and Research shall prepare, develop, and transmit to the Resources Agency guidelines for the mitigation of GHG emissions or the effects of GHG emissions as required by this division, including, but not limited to, effects associated with transportation or energy consumption. (b) On or before January 1, 2010, the Resources Agency shall certify and adopt guidelines prepared and developed by the Office of Planning and Research pursuant to subdivision (a)" (SB 97). Section 21097 is also added to the Public Resources Code and indicates that the failure to analyze adequately the effects of GHGs in a document related to the environmental review of a transportation project funded under the Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006 does not create a cause of action for a violation. However, SB 97 does not safeguard non-transportation funded projects from being challenged in court for omitting a global climate change analysis.

OPR

The Governor's Office of Planning and Research (OPR) submitted proposed amendments to the CEQA Guidelines to the Secretary for Natural Resources on April 13, 2009. The proposed amendments contain recommendations for addressing greenhouse gas emissions, as required by SB 97. The rulemaking process for the completion and adoption of the Amendments is to be completed by January 1, 2010. The OPR has also published a technical advisory on CEQA and Climate Change, as required under SB 97, on June 19, 2008. The guidance did not include a suggested threshold, but stated that the OPR has asked CARB to, "recommend a method for setting thresholds which will encourage consistency and uniformity in the CEQA analysis of GHG emissions throughout the state." The OPR does recommend that CEQA analyses include the following components:

- Identify GHG emissions;
- Determine significance; and
- Mitigate impacts.

CARB

Under AB 32, the CARB published its Final Expanded List of Early Action Measures to Reduce Greenhouse Gas Emissions in California. Discrete early action measures are currently underway or are enforceable by January 1, 2010. Early action measures are regulatory or non-regulatory and are currently underway or to be initiated by the CARB in the 2007 to 2012 timeframe. The CARB has 44 early action measures that apply to the transportation, commercial, forestry, agriculture, cement, oil and gas, fire suppression, fuels, education, energy efficiency, electricity, and waste sectors. Of those early action measures, nine are considered discrete early action measures, as they are regulatory and enforceable by January 1, 2010. The CARB estimates that the 44 recommendations are expected to result in reductions of at least 42 million metric tons of CO_2 equivalent ($MMTCO_2e$) by 2020, representing approximately 25 percent of the 2020 target.

Under AB 32, the CARB has the primary responsibility for reducing GHG emissions. However, the CAT Report also contains strategies that many other California agencies such as the CSLC can take in carrying out their authority. The CAT published a public review draft of Proposed Early Actions to Mitigate Climate

Change in California. Most of the strategies were in the 2006 CAT Report or are similar to the 2006 CAT strategies.

California is also exploring the possibility of cap and trade systems for GHGs. The Market Advisory Committee to the CARB published draft recommendations for designing a GHG cap and trade system for California.

Executive Order S-01-07

Executive Order S-01-07 was enacted by California's Governor on January 18, 2007. The order mandates that a statewide goal shall be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020. It also requires that a Low Carbon Fuel Standard for transportation fuels be established for California.

Local Air District Guidance

The SMAQMD released guidance on addressing climate change in CEQA documents on September 6, 2007. The guidance discusses how local agencies adopt significance thresholds, and recommends that CEQA documents include a discussion of the project's GHG emissions from construction and operation. The guidance letter also contains GHG impact mitigation measures available.

4.3.3 Significance Criteria

For the purposes of this EIR, to determine whether impacts to air quality are significant environmental effects, the following questions are analyzed and evaluated. Appendix G of the CEQA Guidelines presents recommended impact questions to assist lead agencies in evaluating environmental impacts. In addition, the local air districts have recommended air pollution thresholds to be used by the lead agencies in determining whether the proposed Project could result in a significant impact. An adverse impact on air quality is considered significant and would require mitigation as specified below.

1. Result in construction or operational emissions that exceed quantitative significance thresholds (including quantitative thresholds for ozone precursors) established by air pollution control districts in which the Project would be constructed (Table 4.3-4);
2. Result in emissions that substantially contribute to an exceedance of a State or Federal ambient air quality standard;

3. Result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is non-attainment under an applicable Federal or State ambient air quality standard. Project emissions would be considered "cumulatively considerable" if the Project would:

   - Require a change in the existing land use designation (i.e., general plan amendment, rezone), and projected emissions of the Project are greater than the emissions anticipated for the site if developed under the existing land use designation; or

   - Projected emissions, or emission concentrations, of the Project are greater than the emissions anticipated for the site if developed under the existing land use designation.

4. Expose sensitive receptors (including residential areas) or the general public to substantial levels of toxic air contaminants; or

5. Create objectionable odors of such frequency, intensity, or duration that would affect a substantial number of people or be otherwise considered a nuisance.

The CSLC does not currently have a defined threshold of significance for climate change or GHG emission impacts. GHG emissions thresholds to be used during CEQA evaluations have not been established at this time by the CARB, OPR, Executive Order, or any of the four counties in which this project is located, nor by legislation.

Table 4.3-4: Daily Thresholds of Significance (pounds per day)

Air District	Construction	Operation
YSAQMD		
NO_X	82	82
ROG	82	82
PM_{10}	150	150
SMAQMD		
NO_X	85	65
ROG	*None*	65

Air District	Construction	Operation
PM_{10}	5 percent of CAAQS/NAAQS[1]	CAAQS/NAAQS[1]
FRAQMD		
NO_X	25	25
ROG	25	25
PM_{10}	80	80
PCAPCD		
NO_X	82	10
ROG	82	10
PM_{10}	82	82
CO	550	550
Notes [1] SMAQMD does not have a daily emission threshold for PM10; however, the criteria of significance are based on the NAAQS and CAAQS.		

Methodology

1. For the construction analysis, the 'worst-case' construction day was determined for Line 406, 407E, 407W, and the DFM, and the air emissions were modeled for that worst-case scenario, for the years of construction estimated for the respective portion of the pipeline. The construction analysis differentiates between the activities in each air district in that only activities that would occur within each air district were compared to that district's thresholds. The analysis was prepared using information provided by PG&E. Data included the anticipated construction equipment per phase of trenching, HDD and jack and bore installation. This information was used to determine the off-road construction emissions for the Project. The EMFAC2007 emission factors were utilized to estimate emissions from the anticipated construction equipment.

2. Data provided also included the average trip length and trips per day for pipe and soils hauling. The hauling, fugitive dust, paving and construction employee trips estimates used the CARB-approved URBEMIS2007 v9.2.4 (URBEMIS) computer program.

3. Daily increases in vehicular emissions associated operation of the Project were generated using URBEMIS. The operational analysis estimated emissions resulting from all maintenance and inspection activities and compared the total projected operational emissions to each air district's thresholds.

4. A detailed description of the methodology, inputs and outputs of the emissions analysis are available in Appendix D.

4.3.4 Applicant Proposed Measures

Applicant Proposed Measures (APMs) have been identified by PG&E in its Preliminary Environmental Analysis prepared for the CSLC. APMs that are relevant to this Section are presented below. This impact analysis assumes that all APMs would be implemented as defined below. Additional mitigation measures are recommended in this Section if it is determined that APMs do not fully mitigate the impacts for which they are presented.

APM AQ-1. PG&E will compile a comprehensive inventory list (i.e., make, model, engine year, horsepower, emission rates) of all heavy-duty off-road (portable and mobile) equipment having 50 horsepower or greater that will be used an aggregate of 40 or more hours for construction and apply the following mitigation measure: The contractor shall provide a plan demonstrating that the heavy-duty (equal to or greater than 50 horsepower) off-road equipment to be used in the construction project will achieve a project-wide fleet-average 20 percent NO_X reduction and 45 percent particulate reduction compared to the most recent CARB fleet average at time of construction.

APM AQ-2. PG&E will ensure that construction equipment exhaust emissions will not exceed Visible Emission limitations (40 percent opacity or Ringelmann 2.0). Operators of vehicles and equipment found to exceed opacity limits will take action to repair the equipment within 72 hours or remove the equipment from service. Failure to comply may result in a Notice of Violation.

APM AQ-3. PG&E will prepare and implement a fugitive dust mitigation plan.

APM AQ-4. The primary contractor will be responsible to ensure that all construction equipment is properly tuned and maintained.

APM AQ-5. PG&E will minimize equipment and vehicle idling time to five minutes.

APM AQ-6. PG&E will ensure that an operational water truck will be on-site at all times, and will apply water to control dust three times daily, or as needed, to prevent dust impacts off-site.

APM AQ-7. PG&E will utilize existing power sources (e.g., available electric power) or clean fuel generators, rather than temporary power generators.

APM AQ-8. PG&E will develop a traffic plan to minimize traffic flow interference from construction activities, as appropriate.

APM AQ-9. PG&E will not allow open burning of removed vegetation.

APM AQ-10. PG&E will ensure that all portable engines and portable engine-driven equipment units used at the project work site, with the exception of on-road and off-road motor vehicles, comply with CARB Portable Equipment Registration with the State or a local district permit.

APM AQ-11. Contractors will limit operation on “spare the air” days within each County.

4.3.5 Impact Analysis and Mitigation

Impact Discussion

Cumulatively Considerable Net Increase of Criteria Pollutants

The Project would not result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is nonattainment under an applicable Federal or State ambient air quality standard. Project emissions would be considered “cumulatively considerable” if the Project would:

1. Require a change in the existing land use designation (i.e., general plan amendment, rezone), and projected emissions of the Project are greater than

the emissions anticipated for the site if developed under the existing land use designation; or

2. Projected emissions, or emission concentrations, of the Project are greater than the emissions anticipated for the site if developed under the existing land use designation.

3. The Project would not require a change in land use designation, and the projected emissions would not be greater than the emissions anticipated for the Project alignment if developed under the existing land use designations. The long-term operational emissions associated with the Project would not constitute a significant increase in operational emissions for the Project area and impacts would be less than significant (Class III).

Sensitive Receptors

Toxic Air Contaminants impacts are assessed using a standard Maximally Exposed Individual health risk of 10 in 1 million. The CARB and the local air districts have categorized any source that poses an increased risk to the general population that is equal to or greater than 10 people out of 1 million contracting cancer as excessive. When estimating this risk, it is assumed that an individual is exposed to the maximum concentration of any given TAC continuously for 70 years. If the risk of such exposure levels meets or exceeds the threshold of 10 excess cancer cases per 1 million people, then the CARB and local air district require the installation of BACT for toxics or maximum available control technology to reduce the risk threshold.

Construction activities would involve the use of diesel-powered construction equipment, which emit DPM. As stated above, risk assessments for residential areas exposed to TACs are generally based on a 70-year period of exposure. Since the use of construction equipment would be temporary and would not be close to the 70-year timeframe, exposure of sensitive receptors to TACs would not be substantial. Emissions of DPM would not be substantial enough to be considered a significant health risk. Therefore, health risks from construction-related DPM would be less than significant.

A review of a map (DMG 2000) containing areas more likely to have rock formations containing naturally occurring asbestos in California indicates that the Project site is not in an area that is likely to contain naturally occurring asbestos. As noted in the Department of Conservation, Division of Mines and Geology’s report (DMG 2000), the map only shows the general location of naturally occurring asbestos-containing formations and may not show all potential occurrences. The nearest locations of documented NOA are shown approximately 13 miles west of Line 406 and 13 miles east of Line 407 East. Since the nearest locations are sufficiently far from the Project location, it is reasonable to assume that there is the little potential for NOA to be present at the Project site. Therefore, the Project construction does not have the potential to disturb NOA.

The Project would not expose sensitive receptors (including residential areas) or the public to substantial levels of toxic air contaminants and impacts would be less than significant (Class III).

Objectionable Odors

The proposed Project does not contain land uses typically associated with emitting objectionable odors. Diesel exhaust and ROGs would be emitted during construction of the Project, which are objectionable to some; however, emissions would disperse rapidly from the Project site and therefore should not be at a level to induce a negative response. Therefore, the construction and operation of the Project is not anticipated to result in significant objectionable odors.

The Project would not create objectionable odors of such frequency, intensity, or duration that would affect a substantial number of people or be otherwise considered a nuisance and impacts would be less than significant (Class III).

Impact AQ-1: Construction or Operation Emissions Exceeding Regional Thresholds

The Project would result in construction or operational emissions that exceed quantitative significance thresholds (including quantitative thresholds for ozone precursors) established by air pollution control districts in which the Project would be constructed (Significant, Class I).

The construction emissions associated with the Project are shown in Table 4.3-5, Table 4.3-6, Table 4.3-7, and Table 4.3-8.

All four major segments of the proposed Project would exceed the local air districts' significance thresholds for NO_X. In addition, Line 407 East, the DFM, and Line 407 West would exceed the FRAQMD's threshold for ROG. The estimated construction schedule for the Project is as follows:

- Line 406: September/October 2009 to February 2010;

- Line 407 West: May 2012 to September 2012;
- Line 407 East: May 2010 to September 2010; and
- DFM: May 2010 to September 2010.

The construction of Line 407 East and the DFM are expected to overlap temporarily. Line 407 East construction would occur in Sutter County and Placer County under the jurisdiction of the FRAQMD and the PCAPCD, respectively. The DFM construction would occur in Sutter County and Sacramento County, under the jurisdiction of the FRAQMD and the SMAQMD, respectively. Therefore, only Sutter County is expected to be impacted by the concurrent construction of Line 407 East and the DFM. The combined impact of Line 407 East and the DFM would exceed the FRAQMD's thresholds of significance for NO_X, ROG, and PM_{10} as shown in Table 4.3-9.

The construction scenario utilized the peak construction activity to estimate the maximum daily air pollutant emissions of concern. The maximum daily emissions for Line 406, 407E, 407W, and the DFM were calculated using the peak trenching activity, construction employee trips, water truck emissions, fugitive dust emissions, soil hauling and pipe hauling.

Construction of Line 406 is expected to begin in 2009 and end in early 2010. The worst-day scenario is applicable to activities occurring in 2009 and 2010. However, because emission factors for on-road and off-road equipment are higher in 2009 than 2010, emissions for construction of Line 406 were only estimated for the 2009 model year. Air pollutant emissions resulting from Line 406 construction activities in 2010 would not be greater than the 2009 modeling estimates.

Table 4.3-5: Line 406 Construction Emissions (2009)

	Pollutant Emissions (lbs/day)				
	NO_X	**ROG**	**CO**	**PM_{10}**	**$PM_{2.5}$**
Maximum Daily Emissions	373.31	36.48	107.07	80.38	14.44
YSAQMD Threshold	82	82	NA	150	NA
Exceed Significance Threshold?	Yes	No	No	No	No
Source: Michael Brandman Associates 2009.					

Table 4.3-6: Line 407E Construction Emissions (2010)

	Pollutant Emissions (lbs/day)				
	NO_X	ROG	CO	PM_{10}	$PM_{2.5}$
Maximum Daily Emissions	359.86	35.00	102.86	79.78	14.62
FRAQMD Threshold	25.00	25.00	NA	80.00	NA
PCAPCD Threshold	82.00	82.00	550.00	82.00	NA
Exceed Significance Threshold?	Yes	Yes	No	No	No

Notes:
NA = Not Applicable
Source: Michael Brandman Associates 2009.

Table 4.3-7: DFM Construction Emissions (2010)

	Pollutant Emissions (lbs/day)				
	NO_X	ROG	CO	PM_{10}	$PM_{2.5}$
Maximum Daily Emissions	348.10	34.23	98.90	79.28	14.19
FRAQMD Threshold	25.00	25.00	NA	80.00	NA
SMAQMD Threshold	85.00	NA	NA	NA*	NA
Exceed Significance Threshold?	Yes	Yes	No	No	No

Notes:
* Concentration based threshold.
NA = Not Applicable
Source: Michael Brandman Associates 2009.

Table 4.3-8: Line 407W Construction Emissions (2012)

	Pollutant Emissions (lbs/day)				
	NO_X	ROG	CO	PM_{10}	$PM_{2.5}$
Maximum Daily Emissions	300.69	30.58	89.58	77.10	14.19
YSAQMD Threshold	82	82	NA	150	NA
FRAQMD Threshold	25.00	25.00	NA	80.00	NA
Exceed Significance Threshold?	Yes	Yes	No	No	No

Notes:
NA = Not Applicable
Source: Michael Brandman Associates 2009.

Table 4.3-9: Maximum Daily Construction Emissions in Sutter County (2010)

	Pollutant Emissions (lbs/day)				
	NO_X	ROG	CO	PM_{10}	$PM_{2.5}$
Line 407 East	359.86	35.00	102.86	79.78	14.62
DFM	348.10	34.23	98.90	79.28	14.19
Maximum Daily Emissions	707.96	69.23	201.76	159.06	28.81
FRAQMD Threshold	25.00	25.00	NA	80.00	NA
Exceed Significance Threshold?	Yes	Yes	No	Yes	No
Notes NA = Not Applicable Source: Michael Brandman Associates 2009.					

Although not required by the individual local air districts or thresholds of significance, the total construction emissions were also calculated for the construction of the Project and are presented for illustrative purposes in Table 4.3-10.

Table 4.3-10: Total Emissions From Project Construction (All Years)

Year of Construction (Line)	Pollutant Emissions (Total Tons)				
	NO_X	ROG	CO	PM_{10}	$PM_{2.5}$
2009 (Line 406)	8.65	0.81	2.53	5.97	1.21
2010 (Line 407 East)	8.73	0.84	2.61	8.02	1.68
2010 (DFM)	1.77	0.17	0.55	5.71	1.20
2012 (Line 407 West)	7.85	0.80	2.50	7.59	1.55
Total	27.00	2.62	8.20	27.29	5.64
Source: Michael Brandman Associates 2009.					

The operational emissions associated with the Project are shown in Table 4.3-11. Based on the table, none of the operational thresholds are anticipated to be exceeded. This is a less than significant impact.

Table 4.3-11: Operational Emissions (2010)

	Pollutant Emissions (lbs/day)				
	NO_X	ROG	CO	PM_{10}	$PM_{2.5}$
Maximum Daily Emissions	0.38	0.08	0.69	0.26	0.05
YSAQMD Threshold	82	82	NA	150	NA
FRAQMD Threshold	25	25	NA	80	NA
SMAQMD Threshold	65	65	NA	NA*	NA
PCAPCD Threshold	10	10	550	82	NA
Exceed Significance Threshold?	No	No	No	No	No

Notes:
* Concentration based threshold.
NA = Not Applicable
Source: Michael Brandman Associates 2009.

APMs AQ-1 through AQ-11 reduce potential emissions from project construction. However, implementation of these APMs would not reduce construction impacts to less than significant. Implementation of APM AQ-1 will reduce expected NOx emissions by 20 percent, but due to the magnitude of NOx emissions, a 20 percent reduction would not reduce the impact to less than significant. Insufficient details and/or lack of a methodology prevent the quantification of reductions under APM AQ-2, APM AQ-3, APM AQ-4, APM AQ-5, APM AQ-7, APM AQ-8, and APM AQ-11. APM AQ-10 is an enhanced compliance measure for an existing registration requirement. As a result, MMs AQ-1a and AQ-1b are required to be implemented.

<u>Mitigation Measures for Impact AQ-1: Construction or Operation Emissions Exceeding Regional Thresholds</u>

MM AQ-1a. **Fugitive PM10 Control.** The following components shall be incorporated into the Dust Control Plan specified in APM AQ-3:

- Reduce speed on unpaved roads to less than 15 mph; and
- Apply soil stabilizers to inactive areas.

MM AQ-1b. **NO_X Mitigation Menu.** If, after completing the comprehensive inventory list identified in APM AQ-1 and associated fleet-wide NOX and PM emission reductions, Project emissions still exceed the air district thresholds for NOX, PG&E shall implement one or a combination of the following mitigation measures (as directed by the applicable air district) to achieve a reduction in NOX to less than the applicable air district's daily threshold of significance for construction:

- Use PuriNO$_X$ reformulated diesel fuel in some or all of the fleet of construction equipment;
- Install diesel catalytic reduction equipment (Cleaire Lean NO$_X$ Catalyst or equivalent) on some or all of the fleet of construction equipment during the construction Project;
- Install the same Lean NO$_X$ Catalyst on third-party diesel equipment operating within the Yolo-Solano/Sacramento nonattainment area for a period not less than one year of operation; or
- Pay a mitigation fee to the respective local air districts to offset NO$_X$ emissions which exceed the applicable thresholds after all other mitigation measures have been applied.

<u>Rationale for Mitigation</u>

MM AQ-1a reduces the estimated fugitive dust emissions from the Project construction. The mitigated output for Line 407 East and the DFM is provided in Appendix D-4 and D-5. Incorporation of this measure reduces the maximum daily emissions of PM$_{10}$ to 29.19 lbs/day for the DFM and to 29.69 lbs/day for Line 407 East, for a total of 58.87 lbs/day of PM$_{10}$, which is less than significant.

MM AQ-1b is based on previous recommendations of the SMAQMD and the YSAQMD for a previous natural gas pipeline project located near Rio Vista that exceeded the applicable NO$_X$ thresholds during construction. With application of MM AQ-1b, NO$_x$ impacts are reduced to less than significant.

<u>Residual Impacts</u>

Although implementation of MM AQ-1b would likely reduce ROG emissions associated with the Project, the amount of vicarious ROG reductions from implementation of the mitigation measure is unknown. Currently, there are no programs for offsetting construction emissions of ROG and impacts would remain significant.

Impact AQ-2: Construction or Operation Emissions Exceeding State or Federal Standards

The Project would result in emissions that substantially contribute to an exceedance of a State or Federal ambient air quality standard (Significant, Class I).

As described above in Impact AQ-1, short-term construction emissions would exceed local air district's significance thresholds for ROG and NO_X (ozone precursors) and PM_{10}. The Project area is currently nonattainment for Federal and State ozone standards and PM_{10}.

Although construction emissions are short-term, the generation of emissions exceeding the recommended thresholds would substantially contribute to existing exceedances of Federal and State standards. As discussed under Impact AQ-1, implementation of APM AQ1 through APM AQ-11 would reduce potential emissions from project construction. However, implementation of these APMs is not adequate to reduce construction impacts to less than significant. As a result, MMs AQ-1a and AQ-1b are required to be implemented.

<u>Mitigation Measures for Impact AQ-2 Construction or Operation Emissions Exceeding State or Federal Standards</u>

MM AQ-1a: Fugitive PM_{10} Control.

MM AQ-1b: NO_X Mitigation Menu.

<u>Rationale for Mitigation</u>

As described above in Impact AQ-1 above, mitigation measure AQ-1a reduces PM_{10} and AQ-1b reduces NO_X emissions from the Project's construction.

<u>Residual Impacts</u>

Implementation of mitigation measure AQ-1a would reduce the Project's construction-generated PM_{10} to less than significant. Implementation of mitigation measure AQ-1b would reduce the Project's construction-generated NO_X impact to less than significant for the YSAQMD, FRAQMD, SMAQMD, and PCAPCD. Although both ROG and NO_X are required for the formation of ozone and the reduction of either precursor affects the amount of ozone generated, the relationship between ROG and NO_X concentrations and the formation of ozone is nonlinear. According to the Draft Sacramento Regional 8-Hour Ozone Attainment and Reasonable Further Progress Plan (Draft 8-Hour Plan), reductions in NO_X emissions are more effective at reducing high ozone levels in downwind areas than ROG reductions, on a ton-per-ton comparison (CARB 2008c). However, reductions of both ROG and NO_X are required to reach attainment of the ozone standards. Therefore, since the Project's construction would continue to exceed the regional ROG thresholds, the Project would substantially contribute to the existing exceedance for Federal and State ozone standards for the years of construction, and, therefore, impacts would remain significant.

Impact AQ-3: Increase in Greenhouse Gas Emissions

The Project would produce greenhouse gas emissions and contribute to climate change (Potentially Significant, Class II).

<u>PG&E's Existing Climate Change Actions</u>

PG&E participates in or leads the following programs designed to reduce climate change impacts in California:

- **EPA's Natural Gas STAR Program.** This program is a voluntary partnership that encourages companies to adopt cost-effective technologies and practices that improve operational efficiency and reduce emissions of methane;

- **PG&E's ClimateSmart™ Program.** This program allows PG&E customers to offset their GHG emissions from their energy use by paying to fund GHG emission reduction projects in California. Examples of GHG emission reduction projects funding through ClimateSmart™ include projects that capture methane gas from dairy farms and landfills and those that conserve and restore California's forests; and

- **California Climate Action Registry (CCAR).** PG&E is a charter member of CCAR, and completes a third-party-verified inventory of their CO_2 emissions.

The above programs represent PG&E's current "business-as-usual" activities that would reduce potential emissions from the Project through offsets for natural gas consumption and reduced methane leakage from the proposed pipeline. However, the extent that these programs would actually reduce potential GHG emissions from the proposed Project is currently unknown.

Emission Estimation Assumptions

Construction. The Project would emit GHGs during construction of the pipeline from combustion of fuels in worker vehicles accessing the site as well as the construction equipment. The Project would also emit GHGs during the transportation of pipeline materials to the Project site.

Exhaust emissions during construction of the Project were estimated using URBEMIS and OFFROAD emission factors, which are presented in Appendix D-6.

Operation. The Project would result in the conveyance of existing and additional supplies of natural gas to end users. The throughput volume used to calculate end-use natural gas consumption was provided by PG&E. PG&E estimated the Project natural gas throughput based on growth projections for the area to be 113,000 million cubic feet. Development of the Project is a response to planned growth in the Project area. As discussed in Section 1.0,, Introduction, PG&E's existing transmission system in the Sacramento Valley region no longer provides sufficient capacity to deliver reliable natural gas service to existing customers, or to extend service to the planned development in the greater Sacramento region. The projected land use development in the Sacramento region requires that PG&E increase local gas transmission pipeline capacity. The capacity of the proposed Project is designed to accommodate existing and approved growth. As a result, the GHG emissions resulting from the operation of the Project are included in the CARB's projected future inventories because the emissions would result from "business-as-usual" growth of anticipated land use. In addition, PG&E's current programs that reduce GHG emissions from their existing operations are also considered to fall under CARB's "business-as-usual" scenario for statewide GHG emission reductions and are already assumed to apply to the Project and its future demand-side natural gas consumers.

Emissions Inventory

The Project would emit GHGs such as carbon dioxide, methane, and nitrous oxide from the exhaust of equipment used during construction. The Project would also emit exhaust of vehicles during operation. The emissions inventory from construction and operation of the Project are presented below in Table 4.3-12 and Table 4.3-13. Detailed GHG calculations are provided in Appendix D-6.

Table 4.3-12: Construction CO_2 Emissions

Year of Construction (Line)	Emissions	
	Total Tons	$MTCO_2e$
2009 (Line 406)	790.33	716.99
2010 (Line 407 East)	970.45	880.40
2010 (DFM)	199.85	181.30
2012 (Line 407 West)	995.64	903.25
Total	**2,956.28**	**2,681.94**

Notes:
Emissions converted from tons per year to metric tons of carbon dioxide equivalents ($MTCO_2e$) per year by using the formula: (tons of gas) x (global warming potential) x (0.9072 metric tons).
Source: Michael Brandman Associates 2009.

Table 4.3-13: Operational CO_2 Emissions (2010)

Activity	Emissions		
	Annual Pounds	Annual Tons	$MTCO_2e$
Maintenance / Inspection / Testing	166.33	3.24	2.94

Notes:
Emissions converted from tons per year to metric tons of carbon dioxide equivalents ($MTCO_2e$) per year by using the formula: (tons of gas) x (global warming potential) x (0.9072 metric tons).

As shown in the tables above, the total metric tons of carbon dioxide equivalents ($MTCO_2e$) produced during construction of the Project are 2681.94. In year 2010, Project-related annual $MTCO_2e$ resulting from annual inspection and maintenance would be approximately 2.94 $MTCO_2e$. This project would generate a small amount of operational GHG emissions from periodic maintenance activities. Therefore, operational GHG emissions are less than significant.

While the construction emissions would occur only during the brief construction period, the emissions would result in a net increase in the production of GHG. Therefore, the construction emissions are considered significant. APM AQ-1, APM AQ-4, APM AQ-7, APM AQ-8, and APM AQ-10 have the potential to reduce construction-generated GHG emissions. However, there are insufficient details in these measures and/or lack of a methodology allowing the reductions to be quantified for these measures. Therefore, implementation of these APMs is insufficient to reduce the impact to less than significant. Implementation of MM AQ-3 is required to reduce construction emissions impacts to a less than significant level.

MM AQ-3 **GHG Emission Offset Program.** The applicant shall participate in a Carbon Offsets Program with CCAR, CARB, or one of the local air districts, and will purchase carbon offsets equivalent to the projected project's GHG emissions to achieve a net zero increase in GHG emissions during the construction phase.

Rationale for Mitigation

Project related emissions will result in a temporary increase due to the construction vehicles and activities. By participating in an Emissions Offset Program, these emissions will be offset through implementation of an established emissions reduction program. Implementation of MM AQ-3 would reduce construction emissions impacts to a less than significant level.

4.3.6 Impacts of Alternatives

A No Project Alternative as well as twelve options have been proposed for the alignment in order to minimize environmental impacts of the proposed Project and to respond to comments from nearby landowners. The twelve options, labeled A through L, have been analyzed in comparison to the portion of the proposed route that would be avoided as a result of the option. Descriptions of the options can be found in Section 3.0, Alternatives and Cumulative Projects, and the options are depicted in Figure 3-2A through Figure 3-2K. A comparison of the air quality impacts of the project alternatives is found in Table 4.3-34. APMs AQ-1 through AQ-11, designed to reduce potential emissions from project construction, would apply to all twelve options.

No Project Alternative

Under the No Project Alternative, no new natural gas pipeline or above-ground stations would be constructed by PG&E in Yolo, Sutter, Sacramento, and Placer counties. There would be no construction and operational emissions associated with the Project. No construction or operational air quality impacts would result under the No Project Alternative.

Option A

Under Option A, the length of Line 406 would be increased by approximately 2,200 feet.

Construction Criteria Pollutants

As described above under Methodology, the construction-related analysis used an estimate of peak construction activity to calculate the maximum daily air pollutant emissions of concern. The maximum daily emissions calculated for Line 406 reflect the worst-case construction scenario that could occur on any one day, on any portion of Line 406. The maximum daily emissions for Line 406 were calculated using the peak trenching activity, construction employee trips, water truck emissions, fugitive dust emissions, soil hauling and pipe hauling. Although lengthening the Project by approximately 2,200 feet under Option A may potentially lengthen the duration of construction, Option A would not modify the estimated peak daily construction activity scenario. Therefore, the amount of daily air pollutant generation from construction activity from Option A would be the same as the proposed alignment (Class I). Implementation of MM AQ-1a and AQ-1b would be required. Maximum daily construction emissions from Option A and Line 406 are provided in Table 4.3-14.

Table 4.3-14: Option A Maximum Daily Construction Emissions

Line (Year of Construction)	Pollutant Emissions (lbs/day)				
	NO_X	ROG	CO	PM_{10}	$PM_{2.5}$
Line 406 Portion (2009)	373.31	36.48	107.07	80.38	14.44
Option A (2009)	373.31	36.48	107.07	80.38	14.44
Source: Michael Brandman Associates 2009.					

Construction Greenhouse Gas

Construction GHG generation associated with Option A was calculated using the same methodology applied to the Project (see Appendix D-1 and D-7). Assuming the additional 2,200 feet of pipeline would be constructed using trenching methods, Option A would increase total Project GHG generation by 16.66 tons of CO_2. Option A would increase calculated Line 406 GHG generation by approximately 2 percent and would increase the total proposed Pipeline GHG generation, estimated as

2,681.94 $MTCO_2e$, by less than 1 percent. Table 4.3-15 displays Option A and Line 406 construction-generated GHG emissions.

Table 4.3-15: Option A Increase in Construction CO_2 Emissions

Year of Construction (Line)	Emissions	
	Total Tons	**$MTCO_2e$**
2009 (Line 406)	790.33	716.99
Option A	16.66	15.11
Total Line 406 with Option A	**806.99**	**732.10**

Notes:
Emissions converted from tons per year to metric tons of carbon dioxide equivalents ($MTCO_2e$) per year by using the formula: (tons of gas) x (global warming potential) x (0.9072 metric tons).
Source: Michael Brandman Associates 2009.

Under the Project analysis, the construction-generated GHG impact was determined to be potentially significant (Class II). Implementation of MM AQ-3 (GHG Emission Offset Program) would reduce this impact to less than significant. Under Option A, construction-generated GHG emissions would continue to be potentially significant (Class II). MM AQ-3 would apply to Option A, if selected. Therefore, implementation of MM AQ-3 would reduce the Option A construction-generated GHG emissions to less than significant.

Operational Impacts

Implementation of Option A would not change the operational activity associated with the Pipeline. Therefore, operational emissions resulting from maintenance, inspection and testing of Option A would be less than significant, the same as for the proposed Project.

Option B

Under Option B, the length of Line 406 would be increased by approximately 2,640 feet.

Construction Criteria Pollutants

Although lengthening the Project by approximately 2,640 feet under Option B may potentially lengthen the duration of construction, Option B would not modify the estimated peak daily construction activity scenario. Therefore, the amount of daily air pollutant generation from construction activity from Option B would be the same as the proposed alignment (Class I). Implementation of MM AQ-1a and AQ-1b would be required. Maximum daily construction emissions from Option B and Line 406 are provided in Table 4.3-16.

Table 4.3-16: Option B Maximum Daily Construction Emissions

Line (Year of Construction)	Pollutant Emissions (lbs/day)				
	NO_X	ROG	CO	PM_{10}	$PM_{2.5}$
Line 406 Portion (2009)	373.31	36.48	107.07	80.38	14.44
Option B (2009)	373.31	36.48	107.07	80.38	14.44

Source: Michael Brandman Associates 2009.

Construction Greenhouse Gas

Construction GHG generation associated with Option B was calculated using the same methodology applied to the Project (see Appendix D-1 and D-7). Assuming the additional 2,640 feet of pipeline would be constructed using trenching methods, Option B would increase total Project GHG generation by 19.86 tons of CO_2. Option B would increase calculated Line 406 GHG generation by approximately 2.5 percent and would increase the total proposed Pipeline GHG generation, estimated as 2,681.94 $MTCO_2e$, by less than 1 percent. Table 4.3-17 displays Option B and Line 406 construction-generated GHG emissions.

Table 4.3-17: Option B Increase in Construction CO_2 Emissions

Year of Construction (Line)	Emissions	
	Total Tons	$MTCO_2e$
2009 (Line 406)	790.33	716.99
Option B	19.86	18.02
Total Line 406 with Option B	**810.19**	**735.007**

Notes:
Emissions converted from tons per year to metric tons of carbon dioxide equivalents ($MTCO_2e$) per year by using the formula: (tons of gas) x (global warming potential) x (0.9072 metric tons).
Source: Michael Brandman Associates 2009.

Under the Project analysis, the construction-generated GHG impact was determined to be potentially significant (Class II). Implementation of MM AQ-3 (GHG Emission Offset Program) would reduce this impact to less than significant. Under Option B, construction-generated GHG emissions would continue to be potentially significant (Class II). MM AQ-3 would apply to Option B, if selected. Therefore, implementation of MM AQ-3 would reduce the Option B construction-generated GHG emissions to less than significant.

Operational Impacts

Implementation of Option B would not change the operational activity associated with the Pipeline. Therefore, operational emissions resulting from maintenance, inspection and testing of Option B would be less than significant, the same as for the proposed Project.

Option C

Under Option C, the length of Line 406 would be increased by approximately 1,150 feet.

Construction Criteria Pollutants

Although lengthening the Project by approximately 1,150 feet under Option C may potentially lengthen the duration of construction, Option C would not modify the estimated peak daily construction activity scenario. Therefore, the amount of daily air pollutant generation from construction activity from Option C would be the same as the proposed alignment (Class I). Implementation of MM AQ-1a and AQ-1b would be required. Maximum daily construction emissions from Option C and Line 406 are provided in Table 4.3-18.

Table 4.3-18: Option C Maximum Daily Construction Emissions

Line (Year of Construction)	Pollutant Emissions (lbs/day)				
	NO_X	ROG	CO	PM_{10}	$PM_{2.5}$
Line 406 Portion (2009)	373.31	36.48	107.07	80.38	14.44
Option C (2009)	373.31	36.48	107.07	80.38	14.44
Source: Michael Brandman Associates 2009.					

Construction Greenhouse Gas

Construction GHG generation associated with Option C was calculated using the same methodology applied to the Project (see Appendix D-1 and D-7). Assuming the additional 1,150 feet of pipeline would be constructed using trenching methods, Option C would increase total Project GHG generation by 8.65 tons of CO_2. Option C would increase calculated Line 406 GHG generation by approximately 1 percent and would increase the total proposed Pipeline GHG generation, estimated as 2,681.94 $MTCO_2e$, by less than 0.5 percent. Table 4.3-19 displays Option C and Line 406 construction-generated GHG emissions.

Table 4.3-19: Option C Increase in Construction CO_2 Emissions

Year of Construction (Line)	Emissions	
	Total Tons	$MTCO_2e$
2009 (Line 406)	790.33	716.99
Option C	8.65	7.85
Total Line 406 with Option C	**798.98**	**724.837**

Notes:
Emissions converted from tons per year to metric tons of carbon dioxide equivalents ($MTCO_2e$) per year by using the formula: (tons of gas) x (global warming potential) x (0.9072 metric tons).
Source: Michael Brandman Associates 2009.

Under the Project analysis, the construction-generated GHG impact was determined to be potentially significant (Class II). Implementation of MM AQ-3 (GHG Emission Offset Program) would reduce this impact to less than significant. Under Option C, construction-generated GHG emissions would continue to be potentially significant (Class II). MM AQ-3 would apply to Option C, if selected. Therefore, implementation of MM AQ-3 would reduce the Option C construction-generated GHG emissions to less than significant.

Operational Impacts

Implementation of Option C would not change the operational activity associated with the Pipeline. Therefore, operational emissions resulting from maintenance, inspection and testing of Option C would be less than significant, the same as for the proposed Project.

Option D

Under Option D, the length of Line 406 would be increased by approximately 860 feet.

Construction Criteria Pollutants

Although lengthening the Project by approximately 860 feet under Option D may potentially lengthen the duration of construction, Option D would not modify the estimated peak daily construction activity scenario. Therefore, the amount of daily air pollutant generation from construction activity from Option D would be the same as the proposed alignment (Class I). Implementation of MM AQ-1a and AQ-1b would be required. Maximum daily construction emissions from Option D and Line 406 are provided in Table 4.3-20.

Table 4.3-20: Option D Maximum Daily Construction Emissions

Line (Year of Construction)	Pollutant Emissions (lbs/day)				
	NO_X	ROG	CO	PM_{10}	$PM_{2.5}$
Line 406 Portion (2009)	373.31	36.48	107.07	80.38	14.44
Option D (2009)	373.31	36.48	107.07	80.38	14.44
Source: Michael Brandman Associates 2009.					

Construction Greenhouse Gas

Construction GHG generation associated with Option D was calculated using the same methodology applied to the Project (see Appendix D-1 and D-7). Assuming the additional 860 feet of pipeline would be constructed using trenching methods, Option D would increase total Project GHG generation by 6.47 tons of CO_2. Option D would increase calculated Line 406 GHG generation by approximately 0.8 percent and would increase the total proposed Pipeline GHG generation, estimated as 2,681.94 $MTCO_2e$, by 0.2 percent. Table 4.3-21 displays Option D and Line 406 construction-generated GHG emissions.

Table 4.3-21: Option D Increase in Construction CO_2 Emissions

Year of Construction (Line)	Emissions	
	Total Tons	$MTCO_2e$
2009 (Line 406)	790.33	716.99
Option D	6.47	5.87
Total Line 406 with Option D	**796.8**	**722.86**

Notes:
Emissions converted from tons per year to metric tons of carbon dioxide equivalents ($MTCO_2e$) per year by using the formula: (tons of gas) x (global warming potential) x (0.9072 metric tons).
Source: Michael Brandman Associates 2009.

Under the Project analysis, the construction-generated GHG impact was determined to be potentially significant (Class II). Implementation of MM AQ-3 (GHG Emission Offset Program) would reduce this impact to less than significant. Under Option D, construction-generated GHG emissions would continue to be potentially significant (Class II). MM AQ-3 would apply to Option D, if selected. Therefore, implementation of MM AQ-3 would reduce the Option D construction-generated GHG emissions to less than significant.

Operational Impacts

Implementation of Option D would not change the operational activity associated with the Pipeline. Therefore, operational emissions resulting from maintenance, inspection and testing of Option D would be less than significant, the same as for the proposed Project.

Option E

Under Option E, the length of Line 406 would be increased by approximately 3,480 feet.

Construction Criteria Pollutants

Although lengthening the Project by approximately 3,480 feet under Option E may potentially lengthen the duration of construction, Option E would not modify the estimated peak daily construction activity scenario. Therefore, the amount of daily air pollutant generation from construction activity from Option E would be the same as the proposed alignment (Class I). Implementation of MM AQ-1a and AQ-1b would be required. Maximum daily construction emissions from Option E and Line 406 are provided in Table 4.3-22.

Table 4.3-22: Option E Maximum Daily Construction Emissions

Line (Year of Construction)	Pollutant Emissions (lbs/day)				
	NO_X	ROG	CO	PM_{10}	$PM_{2.5}$
Line 406 Portion (2009)	373.31	36.48	107.07	80.38	14.44
Option E (2009)	373.31	36.48	107.07	80.38	14.44
Source: Michael Brandman Associates 2009.					

Construction Greenhouse Gas

Construction GHG generation associated with Option E was calculated using the same methodology applied to the Project (see Appendix D-1 and D-7). Assuming the additional 3,480 feet of pipeline would be constructed using trenching methods, Option E would increase total Project GHG generation by 28.39 tons of CO_2. Option E would increase calculated Line 406 GHG generation by approximately 3.6 percent and would increase the total proposed Pipeline GHG generation, estimated as 2,681.94 $MTCO_2e$, by 1 percent. Table 4.3-23 displays Option E and Line 406 construction-generated GHG emissions.

Table 4.3-23: Option E Increase in Construction CO_2 Emissions

Year of Construction (Line)	Emissions	
	Total Tons	$MTCO_2e$
2009 (Line 406)	790.33	716.99
Option E	28.39	25.76
Total Line 406 with Option E	**818.72**	**742.75**
Notes: Emissions converted from tons per year to metric tons of carbon dioxide equivalents ($MTCO_2e$) per year by using the formula: (tons of gas) x (global warming potential) x (0.9072 metric tons). Source: Michael Brandman Associates 2009.		

Under the Project analysis, the construction-generated GHG impact was determined to be potentially significant (Class II). Implementation of MM AQ-3 (GHG Emission

Offset Program) would reduce this impact to less than significant. Under Option E, construction-generated GHG emissions would continue to be potentially significant (Class II). MM AQ-3 would apply to Option E, if selected. Therefore, implementation of MM AQ-3 would reduce the Option E construction-generated GHG emissions to less than significant.

Operational Impacts

Implementation of Option E would not change the operational activity associated with the Pipeline. Therefore, operational emissions resulting from maintenance, inspection and testing of Option E would be less than significant, the same as for the proposed Project.

Option F

Option F would not alter the length of the segment or change the construction methods for Line 406. Therefore, Option F would result in the same construction-generated maximum daily air emissions and total GHGs as the proposed Project. The maximum daily construction emissions for Option F are the same as for Line 406. Option F would not increase or reduce the operational emissions. Impacts would be the same as the proposed Project.

Option G

Option G would not alter the length of the segment or change the construction methods for Line 407 W. Therefore, Option G would result in the same construction-generated maximum daily air emissions and total GHGs as the proposed Project. The maximum daily construction emissions for Option G are the same as for Line 407 W. Option G would not increase or reduce the operational emissions. Impacts would be the same as the proposed Project.

Option H

Under Option H, the length of Line 407 W would be reduced by approximately 2,900 feet. Under Option H, the length of the DFM would not change.

Construction Criteria Pollutants

As described above under Methodology, the construction-related analysis used an estimate of peak construction activity to calculate the maximum daily air pollutant emissions of concern. The maximum daily construction emissions for the portion of Option H that replaces the proposed DFM alignment are the same.

Although reducing the Project by approximately 2,970 feet under Option H may potentially reduce the duration of construction, Option H would not modify the estimated peak daily construction activity scenario. Therefore, the amount of daily air pollutant generation from construction activity from Option H would be the same as the proposed alignment (Class I). Implementation of MM AQ-1a and AQ-1b would be required. Maximum daily construction emissions from Option H and Line 407 W are provided in Table 4.3-24.

Table 4.3-24: Option H Maximum Daily Construction Emissions

Line (Year of Construction)	Pollutant Emissions (lbs/day)				
	NO_X	ROG	CO	PM_{10}	$PM_{2.5}$
Line 407 W Portion (2012)	300.69	30.58	89.58	77.10	14.19
Option H (2012)	300.69	30.58	89.58	77.10	14.19
Source: Michael Brandman Associates 2009.					

Construction Greenhouse Gas

Construction GHG generation associated with Option H was calculated using the same methodology applied to the Project (see Appendix D-1 and D-7). Assuming the reduced 2,900 feet of pipeline would be constructed using trenching methods, Option H would reduce total Project GHG generation by 24.01 tons of CO_2. Option H would reduce calculated Line 407 W GHG generation by approximately 2.5 percent and would decrease the total proposed Pipeline GHG generation, estimated as 2,681.94 $MTCO_2e$, by less than 1 percent. The portion of Option H that replaces the proposed DFM alignment would not increase or decrease total construction-generated GHG emissions. Table 4.3-25 displays Option H and Line 407 W construction-generated GHG emissions.

Table 4.3-25: Option H Decrease in Construction CO_2 Emissions

Year of Construction (Line)	Emissions	
	Total Tons	$MTCO_2e$
2012 (Line 407 W)	995.64	903.25
Option H	-24.01	-21.78
Total Line 407 W with Option H	**971.63**	**881.468**

Year of Construction (Line)	Emissions	
	Total Tons	$MTCO_2e$
Notes: Emissions converted from tons per year to metric tons of carbon dioxide equivalents ($MTCO_2e$) per year by using the formula: (tons of gas) x (global warming potential) x (0.9072 metric tons). Source: Michael Brandman Associates 2009.		

Under the Project analysis, the construction-generated GHG impact was determined to be potentially significant (Class II). Implementation of MM AQ-3 (GHG Emission Offset Program) would reduce this impact to less than significant. Under Option H, construction-generated GHG emissions would continue to be potentially significant (Class II). MM AQ-3 would apply to Option H, if selected. Therefore, implementation of MM AQ-3 would reduce the Option H construction-generated GHG emissions to less than significant.

Operational Impacts

Implementation of Option H would not change the operational activity associated with the Pipeline. Therefore, operational emissions resulting from maintenance, inspection and testing of Option H would be less than significant, the same as for the proposed Project.

Option I

Under Option I, the length of Line 407 E by would be increased approximately 2,900 feet.

Construction Criteria Pollutants

Although lengthening the Project by approximately 2,900 feet under Option I may potentially lengthen the duration of construction, Option I would not modify the estimated peak daily construction activity scenario. Therefore, the amount of daily air pollutant generation from construction activity from Option I would be the same as the proposed alignment (Class I). Implementation of MM AQ-1a and AQ-1b would be required. Maximum daily construction emissions from Option I and Line 407 E are provided in Table 4.3-26.

Table 4.3-26: Option I Maximum Daily Construction Emissions

Line (Year of Construction)	Pollutant Emissions (lbs/day)				
	NO_X	ROG	CO	PM_{10}	$PM_{2.5}$
Line 407 E Portion (2010)	359.86	35.00	102.86	79.78	14.62
Option I (2010)	359.86	35.00	102.86	79.78	14.62
Source: Michael Brandman Associates 2009.					

Construction Greenhouse Gas

Construction GHG generation associated with Option I was calculated using the same methodology applied to the Project (see Appendix D-1 and D-7). Assuming the additional 2,900 feet of pipeline would be constructed using trenching methods, Option I would increase total Project GHG generation by 23.88 tons of CO_2. Option I would increase calculated Line 407 E GHG generation by approximately 2.5 percent and would increase the total proposed Pipeline GHG generation, estimated as 2,681.94 $MTCO_2e$, by less than 1 percent. Table 4.3-27 displays Option I and Line 407 E construction-generated GHG emissions.

Table 4.3-27: Option I Increase in Construction CO_2 Emissions

Year of Construction (Line)	Emissions	
	Total Tons	$MTCO_2e$
2010 (Line 407E)	970.45	880.4
Option I	23.88	21.66
Total Line 407E with Option I	**994.33**	**902.064**
Notes: Emissions converted from tons per year to metric tons of carbon dioxide equivalents ($MTCO_2e$) per year by using the formula: (tons of gas) x (global warming potential) x (0.9072 metric tons). Source: Michael Brandman Associates 2009.		

Under the Project analysis, the construction-generated GHG impact was determined to be potentially significant (Class II). Implementation of MM AQ-3 (GHG Emission Offset Program) would reduce this impact to less than significant. Under Option I, construction-generated GHG emissions would continue to be potentially significant (Class II). MM AQ-3 would apply to Option I, if selected. Therefore, implementation of MM AQ-3 would reduce the Option I construction-generated GHG emissions to less than significant.

Operational Impacts

Implementation of Option I would not change the operational activity associated with the Pipeline. Therefore, operational emissions resulting from maintenance, inspection and testing of Option I would be less than significant, the same as for the proposed Project.

Option J

Under Option J, the length of Line 407 E would be increased by approximately 5,250 feet.

Construction Criteria Pollutants

Although lengthening the Project by approximately 5,250 feet under Option J may potentially lengthen the duration of construction, Option J would not modify the estimated peak daily construction activity scenario. Therefore, the amount of daily air pollutant generation from construction activity from Option J would be the same as the proposed alignment (Class I). Implementation of MM AQ-1a and AQ-1b would be required. Maximum daily construction emissions from Option J and Line 407 E are provided in Table 4.3-28.

Table 4.3-28: Option J Maximum Daily Construction Emissions

Line (Year of Construction)	Pollutant Emissions (lbs/day)				
	NO_X	ROG	CO	PM_{10}	$PM_{2.5}$
Line 407 E Portion (2010)	359.86	35.00	102.86	79.78	14.62
Option J (2010)	359.86	35.00	102.86	79.78	14.62
Source: Michael Brandman Associates 2009.					

Construction Greenhouse Gas

Construction GHG generation associated with Option J was calculated using the same methodology applied to the Project (see Appendix D-1 and D-7). Assuming the additional 5,250 feet of pipeline would be constructed using trenching methods, Option J would increase total Project GHG generation by 42.86 tons of CO_2. Option

J would increase calculated Line 407 E GHG generation by approximately 4.5 percent and would increase the total proposed Pipeline GHG generation, estimated as 2,681.94 $MTCO_2e$, by almost 1.5 percent. Table 4.3-29 displays Option J and Line 407 E construction-generated GHG emissions.

Table 4.3-29: Option J Increase in Construction CO_2 Emissions

Year of Construction (Line)	Emissions	
	Total Tons	$MTCO_2e$
2010 (Line 407E)	970.45	880.4
Option J	42.86	38.88
Total Line 407E with Option J	**1,013.31**	**919.283**

Notes:
Emissions converted from tons per year to metric tons of carbon dioxide equivalents ($MTCO_2e$) per year by using the formula: (tons of gas) x (global warming potential) x (0.9072 metric tons).
Source: Michael Brandman Associates 2009.

Under the Project analysis, the construction-generated GHG impact was determined to be potentially significant (Class II). Implementation of MM AQ-3 (GHG Emission Offset Program) would reduce this impact to less than significant. Under Option J, construction-generated GHG emissions would continue to be potentially significant (Class II). MM AQ-3 would apply to Option J, if selected. Therefore, implementation of MM AQ-3 would reduce the Option J construction-generated GHG emissions to less than significant.

Operational Impacts

Implementation of Option J would not change the operational activity associated with the Pipeline. Therefore, operational emissions resulting from maintenance, inspection and testing of Option J would be less than significant, the same as for the proposed Project.

Option K

Under Option K, the length of Line 407 E would be increased by approximately 70 feet.

Construction Criteria Pollutants

Although lengthening the Project by approximately 70 feet under Option K may potentially lengthen the duration of construction, Option K would not modify the estimated peak daily construction activity scenario. Therefore, the amount of daily air pollutant generation from construction activity from Option K would be the same as the proposed alignment (Class I). Implementation of MM AQ-1a and AQ-1b would be required. Maximum daily construction emissions from Option K and Line 407 E are provided in Table 4.3-30.

Table 4.3-30: Option K Maximum Daily Construction Emissions

Line (Year of Construction)	Pollutant Emissions (lbs/day)				
	NO_X	ROG	CO	PM_{10}	$PM_{2.5}$
Line 407 E Portion (2010)	359.86	35.00	102.86	79.78	14.62
Option K (2010)	359.86	35.00	102.86	79.78	14.62
Source: Michael Brandman Associates 2009.					

Construction Greenhouse Gas

Construction GHG generation associated with Option K was calculated using the same methodology applied to the Project (see Appendix D-1 and D-7). Assuming the additional 70 feet of pipeline would be constructed using trenching methods, Option K would increase total Project GHG generation by 0.58 ton of CO_2. Option K would increase calculated Line 407 E GHG generation by less than 0.1 percent and would increase the total proposed Pipeline GHG generation, estimated as 2,681.94 $MTCO_2e$, by 0.02 percent. Table 4.3-31 displays Option K and Line 407 E construction-generated GHG emissions.

Table 4.3-31: Option K Increase in Construction CO_2 Emissions

Year of Construction (Line)	Emissions	
	Total Tons	$MTCO_2e$
2010 (Line 407E)	970.45	880.4
Option K	0.58	0.53
Total Line 407E with Option K	**971.03**	**880.926**
Notes:		

Year of Construction (Line)	Emissions	
	Total Tons	$MTCO_2e$

Emissions converted from tons per year to metric tons of carbon dioxide equivalents ($MTCO_2e$) per year by using the formula: (tons of gas) x (global warming potential) x (0.9072 metric tons).
Source: Michael Brandman Associates 2009.

Under the Project analysis, the construction-generated GHG impact was determined to be potentially significant (Class II). Implementation of MM AQ-3 (GHG Emission Offset Program) would reduce this impact to less than significant. Under Option K, construction-generated GHG emissions would continue to be potentially significant (Class II). MM AQ-3 would apply to Option K, if selected. Therefore, implementation of MM AQ-3 would reduce the Option K construction-generated GHG emissions to less than significant.

Operational Impacts

Implementation of Option K would not change the operational activity associated with the Pipeline. Therefore, operational emissions resulting from maintenance, inspection and testing of Option K would be less than significant, the same as for the proposed Project.

Option L

Option L would not increase or decrease the length of Line 407 E. However, under Option L, approximately 1,000 feet of trenching for Line 407 E would be replaced by HDD.

Construction Criteria Pollutants

As described above under Methodology, the construction-related analysis used an estimate of peak construction activity to calculate the maximum daily air pollutant emissions of concern. The maximum daily emissions calculated for Line 407 E reflect the worst-case construction scenario that could occur on any one day, on any portion of Line 407 E. The maximum daily emissions for Line 407 E were calculated using the peak trenching activity, construction employee trips, water truck emissions, fugitive dust emissions, soil hauling and pipe hauling. Therefore, although approximately 1,000 feet of trenching would be replaced by HDD under Option L, Option L would not modify the estimated peak daily construction activity scenario for Line 407 E, and selection of Option L would not change the significance of Line 407

E construction (Class I). Implementation of MM AQ-1a and AQ-1b would be required.

However, the maximum daily construction emissions for Option L would be based on HDD activity, pipe hauling and soil hauling. Therefore, daily air pollutant generation from Option L construction activity would be lower than for the portion of the proposed alignment that would be replaced by Option L. Maximum daily construction emissions from Option L and Line 407 E are provided in Table 4.3-32.

Table 4.3-32: Option L Maximum Daily Construction Emissions

Line (Year of Construction)	Pollutant Emissions (lbs/day)				
	NO_X	ROG	CO	PM_{10}	$PM_{2.5}$
Line 407 E Portion (2010)	359.86	35.00	102.86	79.78	14.62
Option L (2010)	136.64	12.23	39.71	54.42	11.12
Source: Michael Brandman Associates 2009.					

Construction Greenhouse Gas

Construction GHG generation associated with Option L was calculated using the same methodology applied to the Project (see Appendix D-1 and D-7). Option L would increase total Project GHG generation by 62.19 tons of CO_2 by replacing a proposed 1,000-foot section of trenching (at 8.16 tons CO_2) with 1,000 feet of HDD (70.35 tons CO_2).

Option L would increase calculated Line 407 E GHG generation by more than 6 percent and would increase the total proposed Pipeline GHG generation, estimated as 2,681.94 $MTCO_2e$, by approximately 2 percent. Table 4.3-33 displays Option L and Line 407 E construction-generated GHG emissions.

Table 4.3-33: Option L Increase in Construction CO_2 Emissions

Year of Construction (Line)	Emissions	
	Total Tons	$MTCO_2e$
2010 (Line 407E)	970.45	880.4
Option L	62.19	56.42
Total Line 407E with Option L	**1,032.64**	**936.819**

Year of Construction (Line)	Emissions	
	Total Tons	$MTCO_2e$
Notes: Emissions converted from tons per year to metric tons of carbon dioxide equivalents ($MTCO_2e$) per year by using the formula: (tons of gas) x (global warming potential) x (0.9072 metric tons). Source: Michael Brandman Associates 2009.		

Under the Project analysis, the construction-generated GHG impact was determined to be potentially significant (Class II). Implementation of MM AQ-3 (GHG Emission Offset Program) would reduce this impact to less than significant. Under Option L, construction-generated GHG emissions would continue to be potentially significant (Class II). MM AQ-3 would apply to Option L, if selected. Therefore, implementation of MM AQ-3 would reduce the Option L construction-generated GHG emissions to less than significant.

Operational Impacts

Implementation of Option L would not change the operational activity associated with the Pipeline. Therefore, operational emissions resulting from maintenance, inspection and testing of Option L would be less than significant, the same as for the proposed Project.

Table 4.3-34: Comparison of Alternatives for Air Quality

Alternative	Comparison with Proposed Project
No Project	No Impacts
Option A	Similar Impacts
Option B	Similar Impacts
Option C	Similar Impacts
Option D	Similar Impacts
Option E	Similar Impacts
Option F	Similar Impacts
Option G	Similar Impacts
Option H	Similar Impacts
Option I	Similar Impacts
Option J	Similar Impacts

Alternative	Comparison with Proposed Project
Option K	Similar Impacts
Option L	Similar Impacts
Source: Michael Brandman Associates 2009.	

4.3.7 Cumulative Projects Impact Analysis

Section 3.0, Alternatives and Cumulative Projects, provides a description of identifiable projects that may be constructed in proximity to the proposed Project. These projects have potential cumulative impacts related to the air quality impacts of the proposed Project. When considered with the cumulative projects, the Project would result in cumulative impacts by contributing to an exceedance of the State and Federal ozone standards. The above projects would generate construction emissions that contribute towards the existing ozone exceedances. The projects, when considered together, would cumulatively contribute to the existing ozone exceedances.

When considered with the cumulative projects, the Project would not result in cumulative net increase of criteria pollutants, as the Project itself would not result in a net increase in criteria pollutants or ozone precursors from Project operations. In addition, the Project operation would not contribute to cumulative odor or toxic air contaminant impacts.

Climate change is essentially a cumulative impact—even a very large individual project cannot generate enough GHG emissions to influence global climate change in a measurable way. Based on the CARB GHG emission inventories, it is statewide and regional land use development, transportation patterns and associated policies that create the cumulative impacts to climate change.

As a result, in order to assess the cumulative impact of an individual project on climate change, large-scale assessments and emission reduction strategies would need to be formulated to comprehensively address GHG emissions on a statewide and regional level from the combination of land use patterns, energy generation and consumption, transportation, water transport, waste disposal, and the other major sources of GHG emissions.

Without such large area assessments that address the larger cumulative nature of GHGs and create a framework for comprehensive GHG emission reductions at the local level, the ability to measure and determine a project's cumulative impact to climate change through the creation of GHG emissions "when added to closely related past, present, and reasonably foreseeable probable future projects" (the CEQA Guidelines section 15355) is speculative at this time and no significance determination can be made.

According to the CEQA Guidelines section 15145, "If, after a thorough investigation, a lead agency finds that a particular impact is too speculative for evaluation, the agency should note its conclusion and terminate the discussion of the impact." The ability to assess the contribution of the GHG emissions from the proposed Project on cumulative global climate change impacts is speculative at this time for the following reasons:

- The potential list of cumulative projects that, when combined with the potential effects of the proposed Project on climate change is unknown, in that it could conceivably include all projects around the globe. Guidelines for establishing the radius for global climate change have not yet been adopted. Without such guidelines, it is impossible to know how big the cumulative impact study area is supposed to be for a particular project. For example, does the list of project include those only within a one-mile radius of the project, or does it include projects within the entire air basin, or the state of California? For this reason, the "project list" approach for conducting a CEQA cumulative impacts analysis is not feasible;

- There is no approved statewide or regional GHG reduction target or plan that covers the local Project area; therefore, the plan approach is not viable at this time. As a result, no such document exists to base such a cumulative discussion or significance finding on. State and local agencies are currently trying to develop strategies to reduce GHGs in their jurisdictions; however, these strategies are not complete at this time; and

- There are no approved methodologies, procedures or guidelines that specify how to calculate and determine the specific linkages and potential impacts that an individual project might have in creating changes to climate.

4.3.8 Summary of Impacts and Mitigation Measures

As detailed above, the Project would result in construction emissions that exceed the quantitative significance thresholds established by the local air pollution control districts, as well as result in construction emissions that substantially contribute to an exceedance of the Federal and State ozone standards. Table 4.3-35 presents a summary of impacts on air quality and the recommended mitigation measures.

Table 4.3-35: Summary of Air Quality Impacts and Mitigation Measures

Impact	Mitigation Measure
AQ-1. Construction or operational emissions exceeding regional thresholds.	**AQ-1a.** Fugitive PM_{10} control. **AQ-1b.** NO_X mitigation menu.
AQ-2. Construction or operational emissions exceeding State or Federal standards.	**AQ-1a.** Fugitive PM_{10} control. **AQ-1b.** NO_X mitigation menu.
AQ-3. Increase in GHG Emissions.	**AQ-3.** GHG Emission Offset Program.
Source: Michael Brandman Associates 2009.	

4.4 BIOLOGICAL RESOURCES

This Section describes the existing biological resources and evaluates potential effects on these resources that may result from Project implementation. This evaluation includes a review of special-status species; wildlife habitats; vegetation communities; and waters of the U.S., including wetlands. The results of this evaluation are based on a combination of field surveys, literature searches, and database queries. For the purposes of this Draft EIR, the "Project study area" includes the proposed pipeline alignment and a 500-foot buffer on either side of the proposed alignment, while the "Project site" is defined as the area that may be disturbed during construction, operation, and maintenance of the project. The Project site includes the six permanent aboveground facilities, staging areas, and the 100-foot-wide construction right-of-way, which would consist of the 50-foot-wide temporary and 50-foot-wide permanent easements along the length of the project (with the exception of the Powerline Road DFM, which would have a 25-foot temporary and a 35-foot-wide permanent easement).

A number of technical studies prepared for the Project were reviewed and their results incorporated into this document. These studies include the following:

- PG&E Line 406 Wetland Delineation Report (CH2MHill 2008) (Appendix E-1);
- Draft Delineation of Waters of the United States, PG&E Line 407 Natural Gas Transmission Pipeline (Gallaway Consulting, Inc. 2007a) (Appendix E-1);
- Addendum to the Delineation of Waters of the United States, PG&E Line 407 Natural Gas Transmission Pipeline (Gallaway Consulting, Inc. 2008a) (Appendix E-1);
- Revised Delineation of Waters of the U.S. Maps for PG&E Line 407 Natural Gas Transmission Pipeline Project (Gallaway Consulting Inc. 2008b);
- Rare Plant Survey, PG&E Line 406 Project in Yolo County, California (CH2MHILL 2007) (Appendix E-2);
- Special-status and Listed Plant Report, PG&E Line 407 East Natural Gas Transmission Pipeline (Gallaway Consulting, Inc. 2007b) (Appendix E-3);
- PG&E Line 407 East Additional Rare Plant Survey (Gallaway Consulting, Inc. 2007c) (Appendix E-4);

- Special-status and Listed Plant Report, PG&E Line 407 West Natural Gas Transmission Pipeline (Gallaway Consulting, Inc. 2007d) (Appendix E-5);
- Special-status Amphibian and Reptile Species Habitat Assessment for the PG&E Natural Gas Transmission Line 406/407 Project (PG&E 2006) (Appendix E-6);
- Special-status Avian and Mammalian Species Habitat Assessment for the Pacific Gas and Electric Company Natural Gas Transmission Line 406/407 Project (PG&E 2007) (Appendix E-7);
- Fish Habitat Assessment for the Pacific Gas and Electric Company Line 406 and Line 407 Pipeline Project (TRC 2007) (Appendix E-8);
- Dry-Season Sampling for Federally Listed Large Branchiopods at the PG&E Line 407 East Project (Helm Biological Consulting 2007) (Appendix E-9);
- Wet-Season Branchiopod Sampling, PG&E Line 407 East Project (Gallaway Consulting, Inc. 2007e) (Appendix E-10);
- Valley Elderberry Longhorn Beetle Survey, PG&E Line 407 West Natural Gas Transmission Pipeline (Gallaway Consulting, Inc. 2007f) (Appendix E-11); and
- Biological Assessment for the Pacific Gas and Electric Company Line 406 and Line 407 Pipeline Project (TRC 2008) (Appendix E-12).

4.4.1 Environmental Setting

The Project study area is located in the southern Sacramento Valley, extending east from the western edge of the Valley to the City of Roseville, and traversing portions of Yolo, Sutter, Sacramento, and Placer counties. Elevation within the Project study area ranges from approximately 50 to 125 feet above mean sea level (msl). The climate within the Project study area is characterized as Mediterranean with hot, dry summers and cool, wet winters. Average annual temperatures range from July highs of 97.8 degrees Fahrenheit (°F) to January lows of 37.6 °F. Average annual precipitation is 19.35 inches; precipitation occurs as rain primarily between the months of October to April (Western Regional Climate Center [WRCC] 2008).

The Project study area is largely rural. Agricultural land uses; including dryland grain crops, deciduous orchards, irrigated row crops, and associated irrigation canals and drainage channels are dominant in the area. The Project begins in the west at the eastern base of the Capay Hills, just north of the unincorporated community of Capay in western Yolo County. The Project extends east across the Sacramento Valley floor traversing miles of agricultural fields. The Project crosses several small tributaries to Cache Creek, most of which have been channelized and are now used to deliver irrigation water; some of these tributaries support emergent vegetation and/or narrow strips of riparian vegetation.

Just east of Interstate (I) 505, the Project enters the western edge of the Dunnigan Hills. Topography of this area is gently to steeply rolling. Vegetation historically was perennial grassland; however, this area now supports California annual grassland, which is characterized by a diverse mix of non-native annuals and native herbaceous annual and perennial plant species. Land uses in the Dunnigan Hills include grazing and dryland grain crops.

From the Dunnigan Hills, the Project continues east along the Valley floor through several miles of agricultural fields and deciduous orchard. The Project then crosses Knights Landing Ridge Cut, which supports a thin strip of riparian vegetation and dense fresh emergent wetland, and enters the Yolo Bypass near the northwest corner of Yolo County. Land within the Yolo Bypass is cultivated extensively for rice. However, in the fall, winter, and spring, particularly in heavy rainfall years, these lands are used as wintering grounds for migratory waterfowl and shore birds.

After crossing Tule Canal, the Project exits the Yolo Bypass, turns north to County Road (CR) 16/Riego Road and continues east for a short distance before crossing the Sacramento River and entering Sutter County just south of Riego Road. At this location, the Sacramento River supports a thin band of riparian vegetation that is dominated by valley oak (*Quercus lobata*) and thick stands of blue elderberry shrubs (*Sambucus mexicana*).

The Project continues east along Riego Road past cultivated rice fields before crossing Steelhead Creek. From here east, the Project crosses scattered areas of vernal pool, vernal swale, fresh water emergent wetland, and seasonal wetland. The Project terminates at the southwestern edge of the City of Roseville at the intersection of Fiddyment Road and Baseline Road.

Vegetation Communities and Wildlife Habitats

Table 4.4-1 illustrates the total acreage of vegetation communities in the Project study area and within the Project site. The descriptions of each vegetation community that follow the table are based on the classification system used in the

Guide to Wildlife Habitats (Mayer and Laudenslayer 1988). By using this classification system, it is possible to predict the wildlife species likely to occur within the Project study area using the California Wildlife Habitat Relationship System (CWHR). CWHR is based upon the Guide to Wildlife Habitats; it is a predictive model that lists species likely to occur in a given location under certain habitat conditions.

Table 4.4-1: Vegetation Communities within the PG&E Line 406/407 Natural Gas Pipeline Project Study Area and Project Site

Vegetation Community	Acreage Within Project Study Area	Acreage Within Project Site			
		Temporary Easement	Permanent Easement	Above-ground Facilities	Project Site Total
Annual Grassland / Ruderal	1256.8	64.50	68.47	1.19	134.16
Riparian Woodland	26.1	0.03	1.01	0	1.04
Valley Oak Woodland	13.3	0.13	0.46	0	0.59
Orchard	234.2	11.00	11.75	0	22.75
Irrigated Row and Field Crops	2329.5	122.77	115.73	0.36	238.86
Rice	681.5	28.73	25.93	0.62	55.28
Developed / Disturbed	569.2	14.74	103.31	0.01	118.05
Fresh Emergent Wetland	3.80	0	0.01	0	0.01
Pond	1.59	0	0	0	0
Riparian Wetland	15.39	0.04	0.75	0	0.79
Seasonal Swale	4.20	0.25	0.46	0	0.71
Seasonal Wetland	24.47	2.79	3.73	0	6.52
Vernal Pool	6.70	0	0.01	0	0.01
Vernal Swale	1.41	0	0.01	0	0.01
Willow Riparian	1.90	0.02	0.02	0	0.04
Water	63.58	1.35	4.29	0	5.64
Total	**5233.54**	**246.35**	**259.11**	**2.18**	**505.46**
Source: Galloway Consulting Inc. 2008; CH2MHill 2008.					

Annual Grassland / Ruderal

Annual grasslands in the Project study area support a diversity of annual grasses and herbaceous annual and perennial forbs; perennial grasses may also still be present in this habitat. Annual grass species commonly occurring in this habitat include wild oat (*Avena barbata, A. fatua*), rip-gut brome (*Bromus diandrus*), soft chess (*B. hordeaceous*), red brome (*B. madritensis*), Italian ryegrass (*Lolium multiflorum*), barley (*Hordeum* sp.), rabbitfoot grass (*Polypogon monspeliensis*), and hedgehog dogtail (*Cynosurus echinatus*). Some perennial grass species, such as purple needlegrass (*Nasella pulchra*) and California melic (*Melica californica*) may also occur in patches.

Although typically dominated by non-native annual grasses, annual grasslands include reservoirs for populations of native annual and perennial herbaceous plant species. These may include brodiaea (*Brodiaea* sp.), blue-dicks (*Dichelostemma capitatum*), gumplant (*Grindelia camporum*), red-maids (*Calandrinia ciliata*), cryptantha (*Cryptantha* sp.), miniature lupine (*Lupinus bicolor*), fiddleneck (*Amsinckia* sp.), bitter-cress (*Cardamine oligosperma*), whisker brush (*Linanthus ciliatus*), goldfields (*Lasthenia* sp.), valley tassels (*Castilleja attenuata*), Chinese houses (*Collinsia heterophylla*), and clarkia (*Clarkia purpurea*), among others.

Annual grasslands provide pollen and nectar sources crucial to California's native bees and other pollinators. They also provide important habitat for a variety of wildlife species. Raptors, including red-tailed hawk (*Buteo jamaicensis*), Swainson's hawk, white-tailed kite (*Elanus leucurus*), barn owl (*Tyto alba*), American kestrel (*Falco sparverius*), northern harrier (*Circus cyaneus*), and others, commonly use open grassland areas for foraging, while species such as western meadowlark (*Sturnella neglecta*) and burrowing owl (*Athene cunicularia*), use open grassland areas for nesting. Mammals common to grassland include coyote (*Canis latrans*), California ground squirrel (*Spermophilus beecheyi*), black-tailed jackrabbit (*Lepus californicus*), and California meadow vole (*Microtus californicus*).

The 1,257 acres of annual grassland/ruderal habitat in the Project study area, occurs throughout the Dunnigan Hills in the west, and in the east from Riego Road to the eastern terminus of the Project. Approximately 134.2 acres would be disturbed under the proposed Project; of these, 1.2 acres would be permanently removed due to construction of aboveground facilities.

Riparian Woodland

Riparian woodland habitats occur in valleys bordered by sloping alluvial fans, slightly dissected terraces, lower foothills, and coastal plains. They are generally associated with low velocity flows, flood plains, and gentle topography (Mayer and Laudenslayer 1988); therefore, trees and shrubs tolerant of seasonal flooding and high groundwater conditions typically dominate these areas. Common overstory associates include valley oak, Oregon ash (*Fraxinus latifolia*), Fremont cottonwood (*Populus fremontii*), black willow (*Salix gooddingii*), and box elder (*Acer negundo*). Common understory associates include California wild rose (*Rosa californica*), elderberry, California wild grape (*Vitis californica*), Himalayan blackberry (*Rubus discolor*), arroyo willow (*Salix lasiolepis*), coyotebrush (*Baccharis pilularis*), buttonbrush (*Cephalanthus occidentalis*), and pipevine (*Aristolochia californica*), among others.

More than 225 species of birds, mammals, reptiles, and amphibians depend on California's riparian habitats (Riparian Habitat Joint Venture 2004). Riparian areas are considered the most critical habitat for conservation of Neotropical migrants and resident birds in the West. They provide important breeding and over-wintering grounds, migration stopover areas, and corridors for dispersal (Riparian Habitat Joint Venture 2004). Bird species identified as having specific conservation concerns that depend upon this habitat include Swainson's hawk, western yellow-billed cuckoo (*Coccyzus americanus occidentalus*), willow flycatcher (*Empidonax trailii*), bank swallow (*Riparia riparia*), tree swallow (*Tachycineta bicolor*), yellow warbler (*Dendroica petechia*), common yellowthroat (*Geothlypis trichas*), and yellow-breasted chat (*Icteria virens*), among others (Riparian Joint Habitat Venture 2004).

Amphibians and reptiles likely to occur in this habitat include western fence lizard (*Sceloporus occidentalis*), Pacific tree frog (*Hyla regilla*), valley garter snake (*Thamnophis sirtalis fitchi*), and Gilbert's skink (*Eumeces gilberti*). Mammals that are typically found within riparian woodland habitat may include broad-footed mole (*Scapanus latimanus*), striped skunk (*Mephitis mephitis*), gray fox (*Urocyon cinereoargenteus*), pallid bat (*Antrozous pallidus*), and western red bat (*Lasiurus blossevillii*). Riparian corridors also provide important foraging habitat for a number of bat species.

Within the Project study area, the 26.1 acres of riparian woodland habitat is restricted primarily to the Sacramento River, Yolo Bypass, Knights Landing Ridge Cut, and larger irrigation channels. Of these, 1.04 acres would be disturbed under the proposed Project.

Valley Oak Woodland

Valley oak woodlands are best developed on deep, well-drained alluvial soils that usually occur in valley bottoms. In the Central Valley, valley oak woodlands often occur adjacent to annual grasslands or form borders along agricultural lands. In the foothills surrounding the valley, valley oak woodland intergrade with blue oak woodland or blue oak-foothill pine habitat; near stream courses it typically intergrades with valley foothill riparian habitat (Mayer and Laudenslayer 1988).

Valley oak woodland canopy is dominated almost exclusively by valley oak. Co-occurring tree species include sycamore (*Platanus racemosa*), black walnut (*Juglans nigra*), interior live oak (*Quercus wislizenii*), boxelder (*Acer negundo*), and blue oak (*Quercus douglasii*). This habitat often supports a well-developed shrub understory.

Oak woodlands, including valley oak woodlands, are known to support an especially diverse community of bird species, including acorn woodpecker (*Melanerpes formicivorus*), blue-gray gnatcatcher (*Polioptila caerulea*), oak titmouse (*Baeolophus inornatus*), western bluebird (*Sialia mexicana*), California quail (*Callipepla californi*a), rufous-sided towhee (*Pipilo erthrophthalmus*), red-shouldered hawk (*B. lineatus*), wild turkey (*Meleagris gallopavo*), Lewis's woodpecker (*Melanerpes lewisii*), Nuttall's woodpecker (*Picoides nuttallii*), white-breasted nuthatch (*Sitta carolinensis*), California thrasher (*Toxostoma redivivum*), western screech owl (*Megascops kennicottii*), and California towhee (*P. crissalis*). Mammal species common in valley oak woodlands includes gray fox, mule deer (*Odocoileus hemionus*), dusky-footed woodrat (*Neotoma fuscipes*), gray squirrel (*Sciurus griseus*), western red bat, and hoary bat (*Lasiurus cinereus*).

The 13.3 acres of valley oak woodland within the Project study area is restricted to the Sacramento River, Tule Canal, and other larger irrigation canals. Of these, 0.59 acre would be disturbed under the proposed Project.

Orchard

Orchards in California are typically habitats dominated by a single tree species. Depending on the tree type and pruning methods, they are usually low, bushy trees with an open understory to facilitate harvest. Orchards include trees, such as, almonds (*Prunus* sp.), apples (*Pyrus malus*), apricots (*Prunus armeniaca*), cherries (*Prunus avium*), figs (*Ficus* sp.), nectarines (*Prunus persica*), peaches (*Prunus* sp.), pears (*Pyrus communis*), pecans (*Carya* sp.), pistachios (*Pistacia vera*), plums (*Prunus* sp.), pomegranates (*Punica granatum*), and walnuts (*Juglans* sp.) (Mayer and Laudenslayer 1988).

Because they lack both structural and plant species diversity, these habitats generally support common wildlife species, including northern flicker (*Colaptes* *auratus*), scrub jay (*Aphelocoma californica*), America crow (*Corvus brachyrhynchos*), plain titmouse (*Parus inornatus*), Brewer's blackbird (*Euphagus cyanocephalus*), house finch (*Carpodacus mexicanus*), northern mockingbird (*Mimus polyglottos*), cedar waxwing (*Bombycilla cedrodorum*), yellow-rumped warbler (*Dendroica coronata*), coyote (*Canis latrans*), raccoon (*Procyon lotor*), and mule deer.

There are 234.2 acres of orchards, including almond and walnut, scattered throughout the Project study area (with the exception of the Dunnigan Hills). Of these, 22.75 acres would be disturbed under the proposed Project.

Irrigated Row and Field Crops

Row crops are located on flat to gently rolling terrain. In California, irrigated row and field crops include asparagus (*Asparagus officinalis*), broccoli (*Brassica* sp.), carrots (*Daucus carota*), cauliflower (*Brassica* sp.), melons (*Cucamis* sp.), onions (*Allium* sp.*),* peppers (*Capsicum annum*) tomatoes (*Lycopersicon esculentum*), strawberries (*Frageria* sp.), and potatoes (*Solanum* sp.), among others. Most irrigated crops are annuals, which are planted in spring and harvested in summer or fall; sometimes they are planted in rotation with other irrigated crops or with dryland grain crops. This vegetation community also includes dryland grain crops such as barley, rye, oats, and wheat. These crops are annual and are often rotated with irrigated crops. They are typically planted in the fall and harvested in the spring (Mayer and Laudenslayer 1988).

Row and field crops are established on the state's most fertile soils, which historically supported an abundance of wildlife unequalled in other sites. Croplands have greatly reduced wildlife habitat richness and diversity in these areas of California. Many species of rodents and birds have adapted to croplands and are controlled by fencing, trapping, and poisoning to prevent excessive crop losses (Mayer and Laudenslayer 1988). Although raptors, including Swainson's hawk, forage in these areas, in general they do not provide significant habitat value. Additional information regarding species such as Swainson's hawk is provided in Table 4.4-3, below.

Approximately 2,329.5 acres of irrigated row and field crops occur throughout the Project study area; tomato appears to be the dominant row crop. Because crops are rotated, the diversity of these crops is likely greater than that observed during a single field visit. Approximately 238.9 acres of irrigated row and field crops would be disturbed under the proposed Project; of these, 0.4 acre would be permanently removed due to construction of aboveground facilities.

Rice

Rice and wild rice (*Zizania aquatica*) are flood-irrigated crops that are seed producing annual grasses. Commercial rice generally is only a couple of feet tall, whereas commercially grown wild rice may be 6 feet tall or taller. Rice is usually grown in leveed fields that are flooded during most of the growing period; soils are allowed to dry to allow for crop maturation and to facilitate harvesting. Rice is planted in spring and harvested in fall. It usually produces 100 percent canopy closure as it matures (Mayer and Laudenslayer 1988).

Since the historic loss of wetlands throughout the Central Valley, California rice fields have been a source of food and habitat for a large number of waterfowl species. An average of 350 pounds per acre (lbs/acre) of unharvested rice grain coupled with 250 lbs/acre of small invertebrates, tubers, edible shoots, and seeds provide a food value nearly equivalent to that produced by natural wetlands. Thus waterfowl have become highly dependent on rice fields (and other grain fields) for food (Hill 1999).

In the Project study area, the 681.5 acres of federally-jurisdictional rice fields occur between Powerline Road and Natomas Road and along the DFM. Approximately 55.28 acres of rice would be disturbed under the proposed Project; of these, 0.6 acre would be permanently removed due to construction of aboveground facilities.

Developed / Disturbed

Disturbed / developed areas are habitats that have been altered significantly. They include urban development, rural residences, paved surfaces, roads (including dirt roads), and landscaped areas associated with these developments. Paved and unpaved roads and rural residences are scattered throughout the length of the project. There are typically a variety of horticultural plant species associated with these areas. Common trees include sweet gum (*Liquidambar styraciflua*), Chinese pistache (*Pistacia chinensis*), white mulberry (*Morus alba*), European hackberry (Celtis australis), Chinese flame tree (*Koelreuteria bipinnata*), and crape myrtle (*Lagerstroemia hybrid*), among others. A wide range of shrubs (e.g., rose, hydrangea) and herbaceous plants (e.g., iris, begonia, dahlia) are typical.

A number of wildlife species have adapted to developed landscapes and are common to urban and backyard suburban environments. They include raccoon, eastern fox squirrel (*Sciurus niger*), American crow, house finch, dark-eyed junco (*Junco hyemalis*), mourning dove, northern mockingbird, white-crowned sparrow (*Zonotrichia leucophrys*), and European starlings (*Sturnus vulgaris*) among others.

Approximately 569.2 acres of disturbed / developed areas occur throughout the Project study area. Approximately 118.05 acres would be disturbed under the proposed Project; of these, approximately 0.1 acre would be permanently removed due to placement of aboveground facilities.

Fresh Emergent Wetland

Fresh emergent wetland habitats are most common on level to gently rolling topography; however, they occur on virtually all exposures and slopes provided a basin or depression is saturated or at least periodically flooded. Fresh emergent wetland vegetation zones characteristically occur as a series of concentric rings that follow basin contours and reflect the relative depth and duration of flooding. Soils are predominantly silt and clay, although coarser sediments and organic material may be intermixed (Mayer and Laudenslayer 1988).

Emergent vegetation consists of rooted plants that have parts extending above the water surface for at least part of the year, and are intolerant of complete inundation over prolonged periods. Water depths vary but rarely exceed 2 meters (6.6 feet) for long periods. Ponding is a condition in which free water covers the soil surface (e.g., in a closed depression) and is removed only by percolation, evaporation, or transpiration.

Fresh emergent wetland is characterized by erect, rooted herbaceous hydrophytes. These species include tule (*Scirpus* sp.), cattail (*Typha* sp.), rushes (*Juncus* sp.), sedges (*Carex* sp.), water plantain (*Alisma plantago-aquatica*), and arrowhead (*Sagittaria* sp.).

Fresh emergent wetlands support a number of small to medium wildlife species and provide food, cover, and water for over 160 species of bird. Species commonly encountered include red-winged blackbird (*Agelaius phoeniceus*), marsh wren (*Cistothorus palustris*), garter snake (*Thamnophis sirtalis*), northern harrier (*Circus cyaneus*), Pacific chorus frog (*Pseudacris regilla*), raccoon, and tree swallow (*Tachycineta bicolor*).

There are several fresh emergent wetlands scattered throughout the Project study area. The largest of these is associated with Curry Creek near the intersection of Baseline Road and Watt Avenue in Placer County (Appendix E-1; Exhibits 42, 46, 52, and 53). Approximately 3.8 acres of fresh emergent wetland occur throughout the Project study area; of these, 0.01 acre would be disturbed under the proposed Project. These features are considered federally jurisdictional under section 404 of the Clean Water Act.

Pond

Ponds are natural or created features that hold water year-round. They are deep enough to maintain open water free of emergent vegetation. There is often associated fresh emergent wetland in shallower areas, near the pond edges.

Because ponds provide open water habitat and associated emergent habitat, they are utilized in some way by nearly all local wildlife for water, food, shelter, or breeding. In addition to those found in fresh emergent wetlands, species may include mallard (*Anas platyrhynchos*), Canada goose (*Branta canadensis*), American coot (*Fulica americana*), western pond turtle (*Emmys marmorata*), California red-legged frog (*Rana draytonii*), double-crested cormorant (*Phalacrocorax auritus*), and a diverse invertebrate community that provides a food base for many of these species.

There are five ponds totaling 1.59 acres in the Project study area. One non-federally-jurisdictional pond is located near Line 406, and four ponds, which are considered federally jurisdictional features, occur along the Line 407 corridor (see Appendix E-1, Exhibits 46 and 47). None of these ponds would be disturbed under the proposed Project.

Riparian Wetland

Riparian habitats occur in valleys bordered by sloping alluvial fans, slightly dissected terraces, lower foothills, and coastal plains. They are generally associated with low velocity flows, flood plains, and gentle topography; therefore, trees and shrubs tolerant of seasonal flooding and high groundwater conditions typically dominate these areas. Riparian wetlands generally are found at the interface between riverine habitat and riparian woodland habitat. Species that utilize these habitats are the same as those associated with riparian woodlands.

There are two federally jurisdictional riparian wetland types within the Project study area: riparian habitat (15.4 acres) and willow riparian habitat (1.9 acres). (Appendix E-1, Exhibits 24 and 25). Approximately 0.79 acres of riparian wetland and 0.04 acre of willow riparian would be disturbed under the proposed Project.

Seasonal Wetlands and Swales

Seasonal wetlands and swales are defined by the positive indication of three wetland parameters: hydrophytic vegetation, hydric soils, and hydrology (e.g., ponding). These features allow water to pond long enough to support hydrophytic vegetation and hydric soils. Seasonal wetlands tend to lack standing water during the late summer months, or during prolonged dry periods. They support hydrophytic species, such as spikerush (*Eleocharis*) that require longer and typically deeper inundation periods than those of vernal species. These features show positive indicators for hydric soils including mottling, an organic stratum, concretions, and oxidized root channels. Seasonal wetlands may be fed or connected by low drainage pathways called “swales.”

Because of their ephemeral nature, seasonal wetlands and swales generally do not support a unique suite of wildlife. However, seasonal wetlands do provide habitat for invertebrate communities whose diversity varies with size of the wetland and duration of ponding, among other factors.

Approximately 24.47 acres of federally jurisdictional seasonal wetlands and 4.20 acres of federally jurisdictional seasonal swales occur within the Project study area, primarily in the eastern portion (see Appendix E-1, Exhibits 39 through 55). Of these, approximately 6.52 acres of seasonal wetland and 0.71 acre of seasonal swale would be disturbed under the proposed Project.

Vernal Pools and Vernal Swales

In addition to supporting positive indicators for hydrophytic vegetation, hydric soil, and wetland hydrology, vernal pools exhibit unique characteristics. Vernal pools form where there is a soil layer below or at the surface that is impermeable or nearly impermeable. Precipitation and surface runoff become trapped or “perched” above this layer. Hardpans are formed by leaching, re-deposition, and cementing of silica materials from high in the soil horizon to a lower (“B”) horizon. In addition, vernal pools typically occur in landscapes that, at a broad scale, are shallowly sloping or nearly level, but on a finer scale may be quite bumpy or uneven.

Since appropriate combinations of climate, soil, and topography often occur over continuous areas rather than in isolated spots, vernal pools in the Central Valley tend to occur in clusters called "complexes." Within these complexes, pools may be fed or connected by swales. Swales are often themselves seasonal wetlands that remain inundated with water for much of the wet season, but not long enough to support strong vernal pool characteristics. Vernal pools may remain inundated until spring or early summer, and gradually dry down during the spring, often forming a unique "bathtub ring" of flowers from endemic vernal pool plants blooming successively at the pool margins.

Vernal pools are distinguished from other types of seasonal wetlands by a unique suite of plant species. In addition, there are a number of invertebrate species that are closely associated, and in some cases endemic, to vernal pool habitats, many of which are federally listed species. They include vernal pool fairy shrimp (*Branchinecta lynchi*), vernal pool tadpool shrimp (*Lepidurus packardi*), and midvalley fairy shrimp (*Branchinecta mesovallensis*). Other closely associated species include Pacific chorus frog, western spadefoot (*Spea hammondii*), and California tiger salamander (*Ambystoma californiense*).

There are 6.7 acres of federally jurisdictional vernal pool and 1.41 acres of federally jurisdictional vernal swale habitat within the Project study area. Vernal pools and vernal swales occur primarily in the eastern portion of the Project study area (Appendix E-1, Exhibits 39 through 55). Up to 0.01 acre of vernal pool would be disturbed under the proposed Project.

Water

Water habitats include those aquatic habitats not discussed above. Within the Project study area, these include riverine, irrigation ditches and canals, ephemeral drainages, and roadside ditches. There are a total of 63.58 acres of water features in the Project study area; of these, approximately 5.64 acres would be disturbed under the proposed project. The federal jurisdictional status of each of these types of water features is discussed in the following Section, entitled Waters of the U.S., Including Wetlands.

Riverine habitats include rivers and streams. The temperature of riverine habitat is not constant; in general, small, shallow streams tend to follow, but lag behind air temperatures, warming and cooling with the seasons. Rivers and streams with large areas exposed to direct sunlight are warmer than those shaded by trees, shrubs and high, steep banks (Mayer and Laudenslayer 1988). Variation in velocity, temperature and other abiotic factors generally determines the biotic diversity of riverine habitat. Species that depend upon these habitats include river otter (*Lutra canadensis*), various waterfowl, and fish species such as chinook salmon (*Oncorynchus tshawytscha*), and steelhead (*Oncorynchus mykiss*).

Within the Project study area, riverine habitat is restricted to the Sacramento River, Curry Creek, Knights Landing Ridge Cut, Cache Creek, Tule Canal, and Steelhead Creek. The largest of these features is the Sacramento River, which cuts through the western portion of the Project study area flowing north to south towards the San Francisco Bay. The Sacramento River encompasses approximately 12.29 acres (all of which is federally jurisdictional) of the Project study area, 0.58 acre of which would be disturbed under the proposed Project (Appendix E-1, Exhibit 24).

Irrigation canals transfer and deliver water to and from farmers for irrigating their agricultural fields. Due to the constant presence of water in some of the irrigation canals, hydrophytic vegetation has begun to grow in the canals, forming fresh water emergent wetlands and riparian habitats. These canals are under the management of the farmers and the local water district, however, and are subject to occasional maintenance and clearing of the vegetation to prevent the choking-up of the canals. Within the Project study area, there are approximately 42.86 acres of federally jurisdictional canal and 0.27 acre of non-federally-jurisdictional canal. Up to 1.55 acres of jurisdictional canal would be disturbed under the proposed Project.

Ephemeral and roadside drainages are unvegetated drainages that are seasonal in nature. These features carry stormwater flows during the rainy season and are dry during the remainder of the year. Ephemeral drainages are characterized by the presence of a well-defined channel that may show some scour. During storm events, adjacent vegetation may be flattened by high flows, and sediments and other debris may be deposited outside of the channel. Within the Project study area, there are approximately 2.4 acres of federally jurisdictional ephemeral drainages and 2.68 acre of non-federally-jurisdictional ephemeral and roadside drainages. Up to 0.04 acre of jurisdictional ephemeral drainage would be disturbed under the proposed Project.

Waters of the U.S., Including Wetlands

Jurisdictional delineations of waters of the U.S., including wetlands, were conducted throughout the Project study area on July 21, 24 through 28, August 10 and 25, 2006, April 4 and 5, 2007; on May 3, 8, and 14, June 21, and July 31, 2007; and on January 30-31, March 3, April 17, and May 5, 2008 (Gallaway Consulting 2007a, 2008a, 2008b), and on March 25 and 28, 2008 (CH2MHill 2008). A series of maps showing the locations of all delineation features is provided in Appendix E-1. The total acreage of federally-jurisdictional wetlands and other waters of the U.S. within the Project study area and within the area that would be subject to disturbance (Project site) is summarized below in Table 4.4-2. Definitions and brief descriptions of the "other waters of the U.S." terminology follows this table. Descriptions of jurisdictional wetland features were included above, under vegetation communities.

Table 4.4-2: Federally Jurisdictional Waters of the U.S., Including Wetlands, Within the PG&E Line 406/407 Natural Gas Pipeline Project Study Area and Project Site

Federally Jurisdictional Features				
Designation	Acres Within Project Study Area	Acres Within the Project Site		
		Temporary Easement	Permanent Easement	Total
Other Waters of the US				
Pond	0.11	0.00	0.00	0.00
Non-Relatively Permanent Water	2.4	0.01	0.03	0.04
Relatively Permanent Water	42.86	0.32	1.23	1.55
Traditionally Navigable Water	12.29	0.00	0.58	0.58
Total	**57.65**	**0.33**	**1.84**	**2.17**
Wetlands				
Fresh Emergent Wetland	3.80	0.00	0.10	0.10
Riparian Wetland	15.392	0.04	0.75	0.79
Seasonal Swale	4.20	0.25	0.46	0.71
Seasonal Wetland	24.47	2.79	3.73	6.52
Vernal Pool	6.70	0.00	0.10	0.10
Vernal Swale	1.41	0.00	0.01	0.01
Willow Riparian	1.90	0.02	0.02	0.04
Rice	681.45	28.73	26.55	55.28

Federally Jurisdictional Features				
Designation	Acres Within Project Study Area	Acres Within the Project Site		
		Temporary Easement	Permanent Easement	Total
Total	**739.32**	**31.83**	**31.72**	**63.55**
Total All Features	**796.97**	**28.73**	**26.55**	**65.95**
Source: Galloway Consulting Inc. 2007, 2008; CH2MHill 2008.				

Other Waters of the U.S.

Other Waters of the U.S. are seasonal or perennial water bodies, including lakes, stream channels, drainages, ponds, and other surface water features that exhibit an ordinary high-water mark but lack positive indicators for one or more of the three wetland parameters (i.e., hydrophytic vegetation, hydric soil, and wetland hydrology) (33 CFR 328.4). The above definition was applied while delineating all Other Waters of the U.S. Drainages exhibit an ordinary high water mark and contained bed, bank, and/or scour morphology.

Pond

While ponds are not typically considered jurisdictional features, hydrological connectivity is apparent for four ponds in the Project study area (0.11 acres). Pond 1 is located within a jurisdictional seasonal swale feature and Pond 2 is directly connected to a jurisdictional Relative Permanent Water (RPW). The connectivity is not apparent from review of aerial photos for the other two pond features; however, during the site visit, USACE project manager, Erin Hess, stated that these two ponds should be identified as jurisdictional features. Pond 3 is part of a series of ponds that overflows into a remnant portion of a historic drainage located in an adjacent agricultural field. This series of ponds may be connected to jurisdictional features within or outside of the assessment area through roadside ditches or via subsurface flow. Pond 4 is a single pond located near a residence and may be connected to jurisdictional features within or outside of the assessment area through roadside ditches or via subsurface flow (Appendix E-1).

Non-Relatively Permanent Waters

A water body is “non-relatively permanent” if it does not hold flows for at least three months out of the year. Non-relatively permanent waters (NRPW) within the Project study area include ephemeral drainages and smaller irrigation ditches that do not hold water for more than 3 months out of the year. There are a total of 2.40 acres of NRPWs scattered throughout the length of the Project study area, predominantly traversing annual grassland/ruderal habitat (Appendix E-1).

Relatively Permanent Waters

A water body is “relatively permanent” if its flow is year round or its flow is continuous at least “seasonally,” (e.g., typically 3 months). Wetlands adjacent to a “relatively permanent” tributary are also jurisdictional if those wetlands directly abut such a tributary. Relatively permanent waters (RPW) within the Project study area include Tule Canal, Knights Landing Ridge Cut, the main tributary to Knights Landing Ridge Cut, Natomas East Main Drainage Canal, Curry Creek, and a few of the larger irrigation canals which hold water for more than 3 months out of the year. These irrigation canals transfer and deliver water to and from farmers for irrigating their agricultural fields.

The Knights Landing Ridge Cut flows into Tule Canal, which in turn flows directly into the Sacramento River. The other larger unnamed irrigation canals along the western portion of the Project flow directly into Tule Canal, Knights Landing Ridge Cut, or the Sacramento River. In the eastern portion of the Project, the Natomas East Main Drainage Canal flows directly into the American River further south of the survey area and Curry Creek flows into the Natomas East Main Drainage Canal north of the survey area. The other larger unnamed irrigation canals in the eastern portion of the Project flow either into the East Drainage Canal or West Drainage Canal; these two canals merge further south of the Project area to form the Natomas East Main Drainage Canal, which then flows directly into the Sacramento River.

Due to the constant presence of water in some of the irrigation canals, hydrophytic vegetation has begun to grow in the canals, forming fresh water emergent wetlands and riparian habitats. These canals are under the management of the farmers and the local water district, however, and are subject to occasional maintenance and clearing of the vegetation to prevent the choking-up of the canals.

There are a total of 42.86 acres of RPWs scattered along the length of the Project study area that traverse annual grassland/ruderal, irrigated row and field crop, riparian woodland, rice, orchard, and developed/disturbed areas (Appendix E-1).

Traditionally Navigable Waters

Traditionally Navigable Waters (TNWs) includes all of the "navigable water of the United States," defined in 33 Code of Federal Regulations (CFR) section 329, and by numerous decisions of the Federal courts, plus all other waters that are navigable-in-fact. As defined in 33 CFR section 329, "Navigable waters of the United States are those waters that are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. A determination of navigability, once made, applies laterally over the entire surface of the water body, and is not extinguished by later actions or events which impede or destroy navigable capacity." The one traditional navigable water (TNW) found within the Project study area is the Sacramento River. It cuts through the western portion of the Project study area flowing north to south towards the San Francisco Bay. The Sacramento River encompasses approximately 12.29 acres of the Project study area and traverses riparian woodland habitat (Appendix E-1, Exhibit 24).

Other Sensitive Resources

The Project study area contains a large number of native and horticultural trees. Many of these trees, because of their size, are suitable for nesting use by raptor species, including Swainson's hawk. Other wildlife that rely on trees include other nesting birds (migratory songbirds) and roosting bat species. In the Central Valley, nest trees are a limiting resources and their loss is considered significant.

Recent aerial photography (NAIP 2005) was reviewed to estimate the total number of potential nesting trees within the Project site (100-foot right-of-way) as well as within 250 feet of the Project site. Approximately 206 trees occur within the Project site and would be disturbed due to construction of the proposed Project. An additional 1,967 trees occur within 250 feet of the Project site.

In addition to their potential habitat value, native oak trees receive further protection under state and county tree protection ordinances, which generally recognize the value of oak trees to both the natural and human environments. Oaks bring with them a host of species that rely on acorns as a food source particularly during winter months.

Special-Status Species

Special-status species are those plants and animals that, because of their recognized rarity or vulnerability to various causes of habitat loss or population decline, are recognized in some fashion by Federal, State, or other agencies as deserving special consideration. Some of these species receive specific legal protection pursuant to Federal or State endangered species legislation. Others lack such legal protection, but have been characterized as "sensitive" because of adopted policies and expertise of State resource agencies or organizations with acknowledged expertise, or policies adopted by local governmental agencies such as counties, cities, and special districts to meet local conservation objectives. These species are referred to collectively as "special-status species" in this EIR, following a convention that has developed in practice but has no official sanction. The various categories encompassed by the term, and the legal status of each, are discussed later in this section under Section 4.4.2, Regulatory Setting.

For the purposes of this EIR, special-status species are those species:

- Listed as threatened or endangered under the Federal Endangered Species Act (ESA) and those species formally proposed or candidates for listing;
- Listed as threatened or endangered under California ESA (CESA) or candidates for listing;
- Designated as endangered or rare pursuant to California Fish and Game Code (section 1901);
- Designated as fully protected pursuant to California Fish and Game Code (sections 3511, 4700, and 5050);
- Designated as a species of special concern by California Department of Fish and Game (CDFG); and
- Plants listed as rare under the California Native Plant Protection Act or considered by the California Native Plant Society (CNPS) as List 1A, 1B, or 2 species.

Methodology

This evaluation of biological resources includes a review and inventory of potentially occurring special-status species (including those officially designated as "endangered" or "threatened"), wildlife habitats, vegetation communities, and jurisdictional waters of the U.S. The setting descriptions provided in this section are based upon a combination of field reconnaissance, literature reviews, and database queries. The reference data reviewed for this report include the following:

- Esparto, Madison, Woodland, Knights Landing, Verona, Grays Bend, Taylor Monument, Rio Linda, Citrus Heights, Pleasant Grove, and Roseville, California, 7.5-minute topographic quadrangles (U.S. Department of the Interior, Geological Survey);
- CDFG California Wildlife Habitat Relationship System (CWHR) (CDFG 2005);
- California Natural Diversity Database (CNDDB), Rarefind computer program for the following 7.5-minute quadrangles: Esparto, Madison, Woodland, Knights Landing, Verona, Grays Bend, Taylor Monument, Rio Linda, Citrus Heights, Pleasant Grove, and Roseville, California (CDFG 2008);
- Inventory of Rare and Endangered Plants for the following 7.5-minute quadrangles: Esparto, Madison, Woodland, Knights Landing, Verona, Grays Bend, Taylor Monument, Rio Linda, Citrus Heights, Pleasant Grove, and Roseville, California (CNPS 2004);
- Special Animals List (California Department of Fish and Game, 2008a);
- Endangered and Threatened Animals List (California Department of Fish and Game 2008b)
- Special Plants List (CDFG 2008c); and
- List of Federal Endangered and Threatened Species that May Be Affected by Projects in the Esparto, Madison, Woodland, Knights Landing, Verona, Grays Bend, Taylor Monument, Rio Linda, Citrus Heights, Pleasant Grove, and Roseville, California 7.5-minute quadrangles (U. S. Fish and Wildlife Service [USFWS] 2008).

Special-Status Plant Species

The 26 special-status plant species reviewed for this document are listed in a table provided in Appendix E-13. This list was compiled based upon query results from CNDDB and the CNPS on-line inventory, as well as a list obtained from the U.S.

Fish and Wildlife Service (USFWS). CNDDB-recorded occurrences of special-status plant species within 5 miles of the Project site are shown in Figure 4.4-1.

Several regionally-occurring species were determined not to have potential to occur within the Project site either because the distribution of the species does not extend into the Project study area, or because the habitat and/or microsite conditions (e.g., serpentine soils, mesic sites) required by the species are not present.

Surveys for the special-status plant species having potential to occur within the Project study area were conducted within all suitable habitats on May 5 and 12, and July 21, 24, and 26, 2006; on May 3, 8, and 14, 2007; and on May 31 and June 1, 2007. One special-status plant species, dwarf downingia (*Downingia pusilla*), was identified within the Project study area during protocol-level surveys (Gallaway Consulting 2007b). Five occurrences of dwarf downingia totaling approximately 1,541 individuals were mapped along Riego Road in the eastern portion of the Project study area (Appendix E-3, Figure 3). A detailed description of this species' life history and ecology is provided below.

Dwarf Downingia

Dwarf downingia (*Downingia pusilla)*, a strict endemic of the vernal pool hydrologic regime, is an annual member of the bellflower family (*Campanulaceae*). Mature plants can be erect and less than 1.2 inches in height at maturity; or longer, branched stems (up to 6 inches) may sprawl horizontally forming relatively dense colonies, or mix with the other sprawling vernal pool species. (Dittes and Guardino Consulting 2005).

Dwarf downingia is a self-fertilizing species; natural dispersal of seeds likely occurs via flowing water, transport on feet and feathers of waterfowl, and in mud on hooves and legs of livestock. Occurrences are associated mainly with northern claypan vernal pools in central Sacramento County, with northern hardpan vernal pools in the foothills of the Sierra Nevada, and with vernal pools of the interior valleys of the Coast Range in Napa and Sonoma counties. Throughout this area, the species occurs on a variety of landforms and soil associations (Dittes and Guardino Consulting 2005).

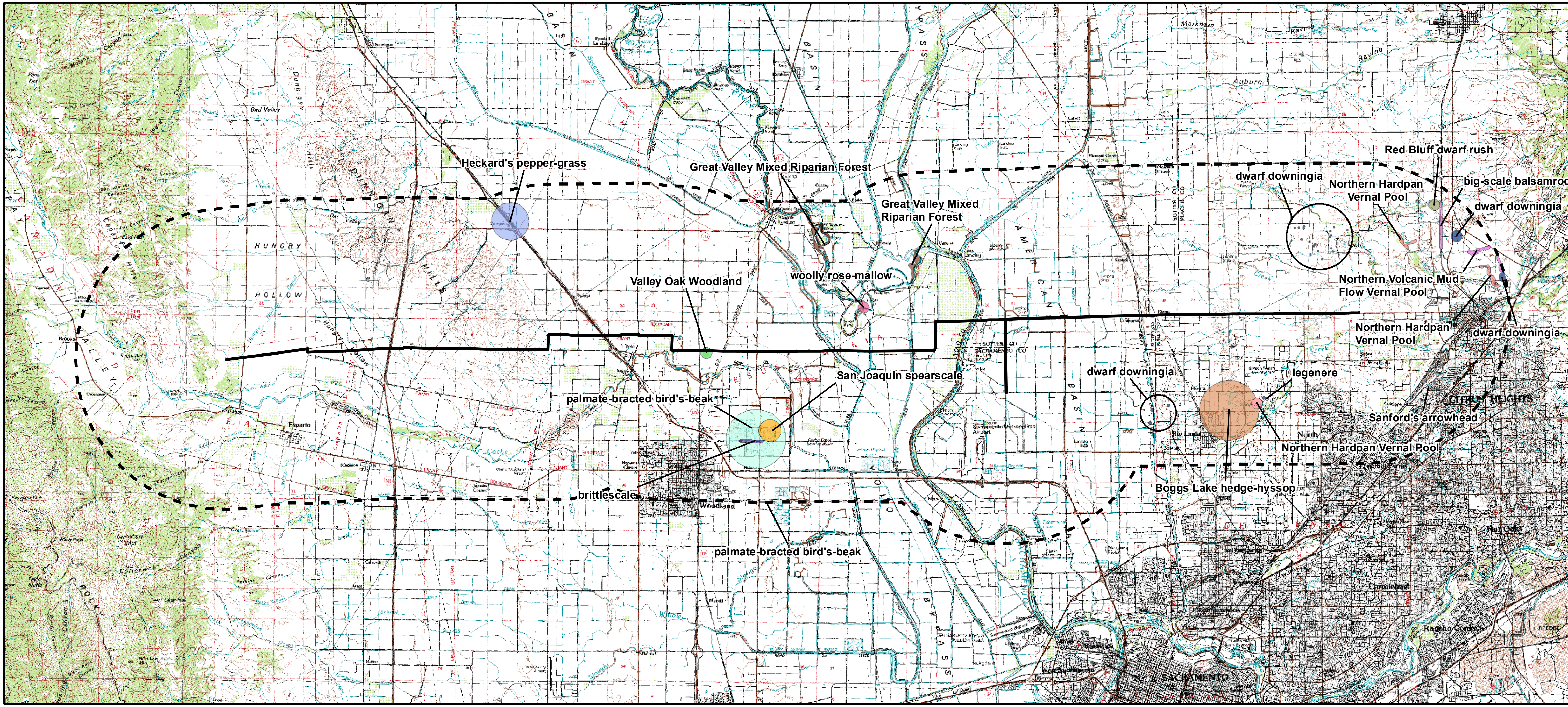
Dwarf downingia is a strict endemic of the vernal pool hydrologic cycle, and occupies more commonly occurring, smaller and/or shallower vernal pools with more "flashy" hydrology. Plant species that commonly co-occur with dwarf downingia include Fremont's goldfields (*Lasthenia fremontii*), smooth goldfields (*L. glaberrima*), dwarf wooly marbles (*Psilocarphus brevissimus*), annual hairgrass (*Deschampsia danthonoides*), popcorn flower (*Plagiobothrys* sp.), double-horned downingia (*Downingia bicornuta*), American pillwort (*Pilularia americana*), quillwort (*Isoetes howellii*), and coyote thistle (*Eryngium* sp.), among others (Dittes and Guardino Consulting 2005).

Potential direct threats to dwarf downingia include: loss of vernal pool habitat to agricultural or urban/industrial land-use conversions; construction and maintenance of firebreaks, roads, and utility corridors; inappropriate livestock grazing regimes; grassland fires; recreational vehicles; equestrian and pedestrian traffic, and refuse dumping. Potential indirect threats to dwarf downingia include: hydrological alteration of sub-watersheds by surrounding developments and land uses; shifts in competitive interactions; windblown refuse accumulation; point and non-point source water pollution; air pollution, and global climate change (Dittes and Guardino Consulting 2005).

Special-Status Wildlife Species

The special-status wildlife species reviewed for this document are listed in a table provided in Appendix E-13. This list was compiled based on the USFWS list and query results from CNDDB and CWHR. The CWHR is a predictive model that lists species likely to occur in a given location under certain habitat conditions. It also predicts the suitability of those conditions for reproduction, cover, and feeding for each modeled species. Information fed into the model for this Project includes location (Yolo, Sacramento, Sutter, and Placer counties) and habitat type (irrigated row crop, annual grassland, etc.). The CWHR does not include any information on plants, fish, invertebrates, or rare natural communities. Several regionally-occurring species were determined not to have potential to occur within the Project area, either because the distribution of the species does not extend into the Project vicinity, or because the habitat or habitat elements (e.g., caves, tall snags) required by the species are not present.

Based upon results of the species review, there are 29 special-status wildlife species with potential to occur within the Project. Descriptions of these species are provided in Table 4.4-3. Recorded occurrences of special-status wildlife species within 5 miles of the Project site are shown in Figure 4.4-2.



Source: California Dept. of Fish and Game CNDDB Data May 2008, CaSIL USGS 100k Scale DRGs, MBA GIS 2008.

Legend

- Proposed Pipeline
- 5-Mile Buffer

Common Name	***(Scientific Name)***
Boggs Lake hedge-hyssop	(*Gratiola heterosepala*)
Heckard's pepper-grass	(*Lepidium latipes var. heckardii*)
Red Bluff dwarf rush	(*Juncus leiospermus var. leiospermus*)
San Joaquin spearscale	(*Atriplex joaquiniana*)
Sanford's arrowhead	(*Sagittaria sanfordii*)
big-scale balsamroot	(*Balsamorhiza macrolepis var. macrolepis*)
brittlescale	(*Atriplex depressa*)
dwarf downingia	(*Downingia pusilla*)
legenere	(*Legenere limosa*)
palmate-bracted bird's-beak	(*Cordylanthus palmatus*)
woolly rose-mallow	(*Hibiscus lasiocarpus*)
Great Valley Mixed Riparian Forest	
Northern Hardpan Vernal Pool	
Northern Volcanic Mud Flow Vernal Pool	
Valley Oak Woodland	

Michael Brandman Associates

NORTH

0 2.5 5 10 Miles

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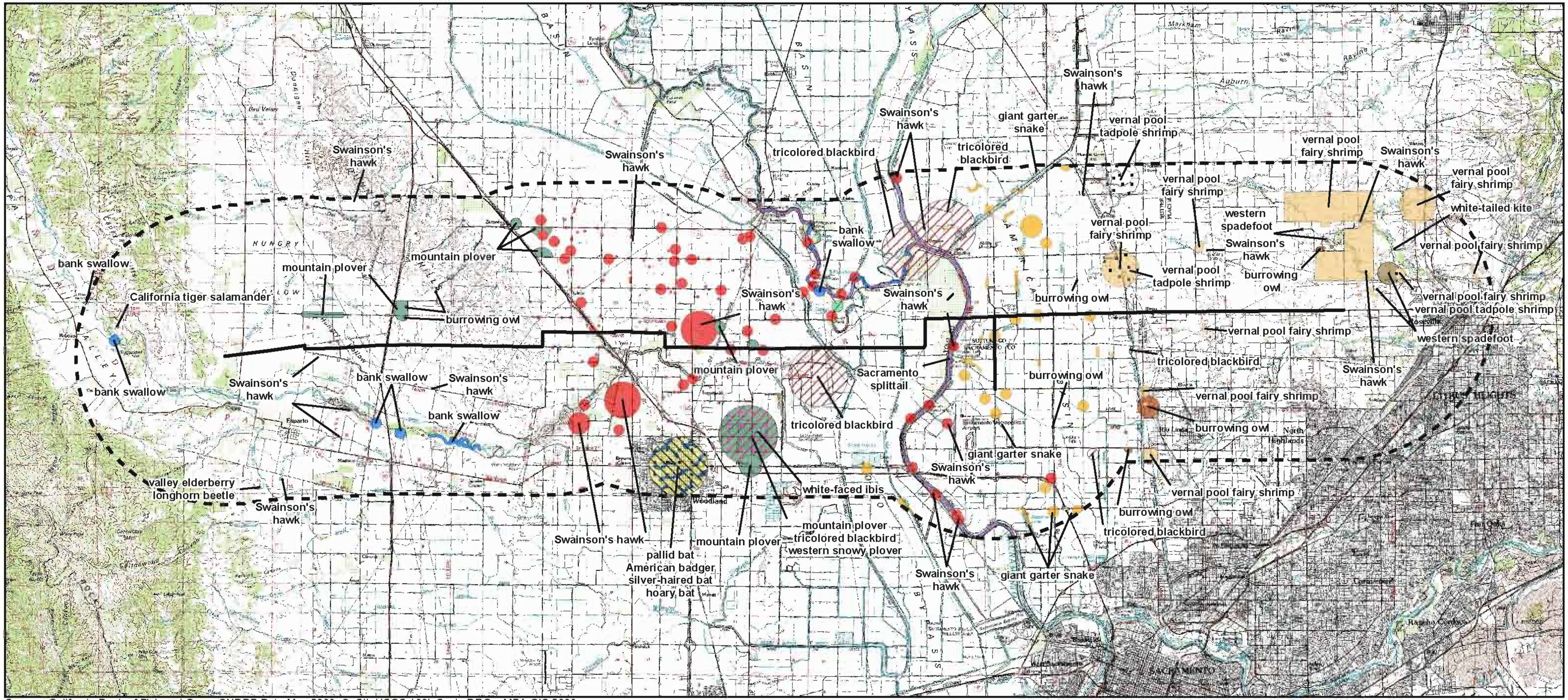
Figure 4.4-1
CNDDB-Recorded Occurrences of Sensitive Habitats and Special-Status Plant Species within Five Miles of the Project Site



Source: California Dept. of Fish and Game CNDDB Data May 2008, CaSIL USGS 100k Scale DRGs, MBA GIS 2008.

Legend

Proposed Pipeline
5-Mile Buffer

Common Name	***(Scientific Name)***
American badger	(*Taxidea taxus*)
California tiger salamander	(*Ambystoma californiense*)
Sacramento splittail	(*Pogonichthys macrolepidotus*)
Swainson's hawk	(*Buteo swainsoni*)
bank swallow	(*Riparia riparia*)
burrowing owl	(*Athene cunicularia*)
giant garter snake	(*Thamnophis gigas*)
hoary bat	(*Lasiurus cinereus*)
mountain plover	(*Charadrius montanus*)
pallid bat	(*Antrozous pallidus*)
silver-haired bat	(*Lasionycteris noctivagans*)
tricolored blackbird	(*Agelaius tricolor*)
valley elderberry longhorn beetle	(*Desmocerus californicus dimorphus*)
vernal pool fairy shrimp	(*Branchinecta lynchi*)
vernal pool tadpole shrimp	(*Lepidurus packardi*)
western snowy plover	(*Charadrius alexandrinus nivosus*)
western spadefoot	(*Spea hammondii*)
white-faced ibis	(*Plegadis chihi*)
white-tailed kite	(*Elanus leucurus*)

Michael Brandman Associates

NORTH

0 2.5 5 10 Miles

Figure 4.4-2
CNDDB-Recorded Occurrences of
Special-Status Wildlife Species within Five Miles of the Project Site

Table 4.4-3: Special-Status Wildlife Species Assessment Table

Scientific Name Common name	Listing Status USFWS/ CDFG	General Habitat Description	Potential for Impacts
Invertebrates			
Branchinecta conservatio Conservancy fairy shrimp	FT/—	Conservancy fairy shrimp occur primarily in vernal pools, seasonal wetlands that fill with water during fall and winter rains and dry up in spring and summer. Typically, the majority of pools in any vernal pool complex are not inhabited by the species at any one time. Different pools within or between complexes may provide habitat for the fairy shrimp in alternative years, as climatic conditions vary.	**Moderate.** Dry- and wet-season protocol surveys were conducted for the proposed Project on November 5, 6, and 18, 2006 by Helm Biological Consulting (2007), and between December 21, 2006 and May 18, 2007 by Gallaway Consulting, Inc. (2007b), to determine the presence or absence of sensitive vernal pool branchiopods, including the conservation fairy shrimp. Cysts belonging to the genus *Branchinecta* were found during dry season surveys; however, due to the similarities in cyst morphology between multiple species belonging to the genus Branchinecta, the presence or absence of this species (*Branchinecta conservatio)* could not be concluded based on the dry season survey alone. Wet season surveys were conducted to substantiate the findings of the dry season survey and complete USFWS protocol survey requirements. This species was not found during any of the wet season surveys and is presumed to be absent from the project site. There are no CNDDB-recorded occurrences of this species within 5 miles of the Project (CNDDB 2008).
Branchinecta lynchi Vernal pool fairy shrimp	FT/—	Vernal pool fairy shrimp occur primarily in vernal pools, seasonal wetlands that fill with water during fall and winter rains and dry up in spring and summer. Typically, the majority of pools in any vernal pool complex are not inhabited by the species at any one time.	**Moderate.** Dry- and wet-season protocol surveys were conducted for the proposed Project on November 5, 6, and 18, 2006 by Helm Biological Consulting (2007), and between December 21, 2006 and May 18, 2007 by Gallaway Consulting, Inc (2007b), to determine the presence or absence of sensitive vernal pool branchiopods, including the vernal pool fairy shrimp. Similar to the conservancy fairy shrimp, the presence of this

Scientific Name Common name	Listing Status USFWS/ CDFG	General Habitat Description	Potential for Impacts
		Different pools within or between complexes may provide habitat for the fairy shrimp in alternative years, as climatic conditions vary.	species (*Branchinecta lynchi*) could not be concluded based on the dry season survey alone. Wet season surveys were conducted to substantiate the findings of the dry season survey and complete USFWS protocol survey requirements. This species was not found during any of the wet season surveys and is presumed to be absent from the project site. There are several CNDDB-recorded occurrences of this species within 5 miles of the Project (CNDDB 2008).
Desmocerus californicus dimorphus Valley elderberry longhorn beetle	FT/—	Associated with elderberry trees (*Sambucus* spp.) in California's Central Valley during its entire life cycle. The adults eat the elderberry foliage until about June when they mate. Upon hatching the larvae then begin to tunnel into the tree where they will spend 1-2 years eating the interior wood, which is their sole food source.	**High.** Twenty-three elderberry shrubs are located within 100 feet of the Project site. Valley elderberry longhorn beetle surveys were conducted for the proposed Project on May 8 and 14, 2007 by Gallaway Consulting, Inc (2007a). Although surveys were conducted during the adult emergence season (March through June), no individual beetles were observed. However, a total of 10 valley elderberry longhorn beetle emergence holes were observed on several of the elderberry bushes that occur within 100 feet of the proposed alignment for Line 407. Based on these results, this species is presumed present. There is a CNDDB-recorded occurrence of this species approximately 1 mile north of the Project (CNDDB 2008).
Amphibian and Reptiles			
Actinemys marmorata Western pond turtle	—/CSC	Ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation. Requires basking sites and suitable upland habitat for egg-laying. May move overland up to 325 feet for egg laying.	**Moderate.** The larger canals, sloughs, and creeks throughout the project area provide suitable habitat for the species. Upland areas surrounding these waterways potentially provide suitable nesting habitat. Habitat assessment surveys for the western pond turtle and other reptile and amphibian species were conducted by PG&E biologists on June 12 and 13, November 30, and December 5 and 7, 2006 (PG&E 2006). Although not

Scientific Name Common name	Listing Status USFWS/ CDFG	General Habitat Description	Potential for Impacts
			detected during surveys, this species has a moderate potential to occur along the canals, sloughs, and creeks throughout the Project site and therefore assumed to be present. There are no CNDDB-recorded occurrences of this species within 5 miles south of the Project site (CNDDB 2008).
Ambystoma californiense California tiger salamander	FE/SSC	From low elevations of the Coast Ranges from Sonoma County to Santa Barbara County and in the Central Valley from Colusa County to Tulare County. Breeds in ephemeral pools and permanent waterbodies within grassland and oak woodland habitats where small mammal burrows occur. Small mammal burrows and upland habitats adjacent to aquatic breeding habitats are frequently used as aestivation sites during the non-breeding season.	**High.** Habitat assessment surveys for the California tiger salamander and other reptile and amphibian species were conducted by PG&E biologists on June 12 and 13, November 30, and December 5 and 7, 2006. Although not observed or otherwise detected during the surveys, this species was determined to have a high potential to use the ephemeral pools and waterways, and adjacent upland habitats that occur along the proposed alignment as breeding and dispersal habitat (PG&E 2006); and therefore is assumed present. There are several CNDDB-recorded occurrences of this species within 5 miles of the Project (CNDDB 2008).
Spea hammondii Western spadefoot toad	—/SSC	Inhabits lowlands in open areas with sandy or gravelly soils, in a variety of habitats including mixed woodlands, grasslands, chaparral, sandy washes, river floodplains, alluvial fans, playas, alkali flats, foothills, and mountains. Breeds in temporary pools and quiet streams.	**High.** Habitat assessment surveys for the western spadefoot toad and other reptile and amphibian species were conducted by PG&E biologists on June 12 and 13, November 30, and December 5 and 7, 2006 (PG&E 2006). Although not detected during surveys, this species was determined to have a moderate to high potential to occur along the vernal pool and seasonal wetland habitat within the Line 407 East segment of the Project site; and therefore is assumed to be present.

Scientific Name Common name	Listing Status USFWS/ CDFG	General Habitat Description	Potential for Impacts
Thamnophis gigas Giant garter snake	FT/CT	Marshes, sloughs, irrigation channels, and occasionally in slow-moving streams. Requires emergent vegetation for cover.	**High.** The Project contains suitable foraging, breeding, and refugia habitat for this species. Habitat assessment surveys for the giant garter snake and other reptile and amphibian species were conducted by PG&E biologists on June 12 and 13, November 30, and December 5 and 7, 2006 (PG&E 2006). Although this species was not detected during habitat assessment surveys, it was determined to have a high potential to occur based on the presence of suitable foraging, breeding, and refugia habitat (PG&E 2006). Furthermore, this species has been previously observed and recorded in 42 separate instances in the lowland areas in the proposed alignment for Line 407 East and West (CNDDB 2008) and therefore is assumed to be present. There are several CNDDB-recorded occurrences of this species within 5 miles of the Project (CNDDB 2008).
Birds			
Agelaius tricolor Tricolored blackbird	—/SSC	Largely endemic to California, most numerous in the Central Valley and nearby vicinity. Breeds near fresh water, preferably in emergent wetland with tall, dense cattails or tules, but also in thickets of willow, blackberry, wild rose, tall herbs. Feeds in grassland and cropland habitats.	**Moderate.** Freshwater marsh habitats and scattered brushy thickets provide marginal nesting habitat. the vegetation, open grassland, and agricultural habitats provide suitable foraging habitat. Habitat assessment surveys for the tricolored blackbird and other avian species were conducted by PG&E biologists on June 12 and 13, November 30, and December 5 and 7, 2006; and on June 29, 2007 (PG&E 2007). Although this species was not observed during surveys, it was determined to have a moderate potential to nest and/or forage within the freshwater marsh and riparian type habitats that occur along the proposed alignment (PG&E 2007) and is therefore assumed to be present. There are several CNDDB-recorded occurrences of his species within 5 miles of the Project (CNDDB 2008).

Scientific Name Common name	Listing Status USFWS/ CDFG	General Habitat Description	Potential for Impacts
Aquila chrysaetos Golden eagle	—/SSC, CFP	Breeds on cliffs or in large trees or electrical towers, forages in open habitats.	**High.** The species was observed during surveys in the Dunnigan Hills. Habitat assessment surveys for the golden eagle and other avian species were conducted by PG&E biologists on June 12 and 13, November 30, December 5 and 7, 2006; and on June 29, 2007 (PG&E 2007). This species was detected during surveys and was determined to have a high potential to forage within the rolling grassland habitat along the Line 406 East segment (PG&E 2007). This species was also determined to have a potential to nest within the isolated trees and tree groves that occur on and in the immediate vicinity of the proposed alignment (PG&E 2007). There are up to 1,967 suitable nesting trees within 250 feet of the proposed Project, 206 of which occur within the Project site. There are no CNDDB-recorded occurrences of this species within 5 miles of the Project site (CNDDB 2008).
Asio flammeus Short-eared owl	—/SSC	Forages in open areas with few trees, such as annual and perennial grasslands, prairies, dunes, meadows, irrigated lands, and saline and fresh emergent wetlands. Nests on dry ground in a depression concealed in vegetation and lined with grasses, forbs, sticks, and feathers, and occasionally in burrows.	**Moderate.** Grasslands in the L406 (Dunnigan Hills) and Line 407 East areas and open agricultural areas within all three segments provide suitable nesting and foraging habitat. Habitat assessment surveys for the short-eared owl and other avian species were conducted by PG&E biologists on June 12 and 13, November 30, December 5 and 7, 2006; and on June 29, 2007 (PG&E 2007). Although this species was not observed during surveys, suitable nesting and foraging habitat was confirmed throughout the open grasslands and agricultural areas along the proposed alignment (PG&E 2007) and is therefore assumed to be present. There are no CNDDB-recorded occurrences of this species within 5 miles of the Project site (CNDDB 2008).

Scientific Name Common name	Listing Status USFWS/ CDFG	General Habitat Description	Potential for Impacts
Athene cunicularia Western burrowing owl	—/SSC	Open, dry annual or perennial grasslands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals.	**High.** Habitat assessment surveys for burrowing owl and other avian species were conducted by PG&E biologists on June 12 and 13, November 30, December 5 and 7, 2006; and on June 29, 2007 (PG&E 2007). This species was observed during surveys and has a high potential to forage and nest throughout the open grasslands and agricultural areas within the Line 406 and Line 407 West segments. The species is not expected to occur within the Line 407 East segment (PG&E 2007). There are CNDDB-recorded occurrences of this species within 5 miles of the Project site (CNDDB 2008).
Branta canadensis leucopareia Aleutian Canada goose	—/SSC	Nests on the Aleutian islands in Alaska and migrates south to the Sacramento and San Joaquin Valleys in winter. Populations are recovering from historically low numbers attributed to the introduction of the Arctic fox to their island breeding grounds. Uses agricultural areas, grasslands, and wetlands. Primarily observed on private ranches near the Stanislaus and San Joaquin rivers.	**Moderate.** Habitat assessment surveys for the Aleutian Canada goose and other avian species were conducted by PG&E biologists on June 12 and 13, November 30, December 5 and 7, 2006; and on June 29, 2007 (PG&E 2007). Although this species was not observed during surveys, it was determined to have a moderate potential to winter within the grassland habitat and agricultural land that occurs throughout the proposed alignment (PG&E 2007) and is therefore assumed to be present. There are no CNDDB-recorded occurrences of this species within 5 miles of the Project site (CNDDB 2008).

Scientific Name Common name	Listing Status USFWS/ CDFG	General Habitat Description	Potential for Impacts
Buteo regalis Ferruginous hawk	—/SSC	Habitats include agricultural flatlands, open prairies, deserts, and semi-arid grasslands featuring scattered trees, rocky mounds or outcrops. May roost or nest on utility structures, trees, shrubs, cliffs, or ground outcroppings. May roost communally and forage in groups on the ground during winter migration. Forages in grasslands and occasionally in other open habitats during migration and winter.	**High.** Habitat assessment surveys for the ferruginous hawk and other avian species were conducted by PG&E biologists on June 12 and 13, November 30, December 5 and 7, 2006; and on June 29, 2007 (PG&E 2007). Although this species was not detected during habitat assessment surveys, suitable wintering and foraging habitat was determined to exist within the open grassland and agriculture areas that occur along the proposed alignment for the Line 406 and Line 407 West segments. This species is not expected to occur within the Line 407 East segment based on the lack of an adequate prey base. Suitable breeding and foraging habitat also occurs within the riparian and oak woodland habitats. There are no CNDDB-recorded occurrences of this species within 5 miles of the Project site (CNDDB 2008).
Buteo swainsoni Swainson's hawk	—/CT	Nests in open areas with stands of few, dense-topped trees in juniper-sage flats, riparian areas, and oak savannas. Forages in open grasslands, grain, and alfalfa fields (supporting rodent populations) adjacent to nesting opportunities.	**High.** Suitable nesting and foraging habitat is present throughout the scattered trees, open grasslands, and agricultural areas of the Project site. Habitat assessment surveys for the Swainson's hawk and other avian species were conducted by PG&E biologists on June 12 and 13, November 30, December 5 and 7, 2006; and on June 29, 2007 (PG&E 2007). This species was observed on numerous occasions during surveys and suitable nesting and foraging habitat was confirmed throughout the scattered trees, open grasslands, and agricultural areas along the proposed alignment (PG&E 2007). There are up to 1,967 suitable nesting trees within 250 feet of the proposed Project, 206 of which occur within the Project site. There are several CNDDB-recorded occurrences of this species within 5 miles of the Project site (CNDDB 2008).

Scientific Name Common name	Listing Status USFWS/ CDFG	General Habitat Description	Potential for Impacts
Charadrius montanus Mountain plover	—/SSC	Winter resident. Found on short grasslands and plowed fields of the Central and Imperial valleys, in foothill valleys west of San Joaquin Valley, and in plowed fields of Los Angeles and western San Bernardino counties. Uses open grasslands, plowed fields with little vegetation, and open sagebrush areas.	**High.** Habitat assessment surveys for mountain plover and other avian species were conducted by PG&E biologists on June 12 and 13, November 30, December 5 and 7, 2006; and on June 29, 2007 (PG&E 2007). This species was identified foraging in the vicinity of the Line 406 segment during surveys, and was determined to have a moderate potential to winter within the grasslands and agricultural fields that occur along the proposed alignment. There are CNDDB-recorded occurrences of this species within 5 miles of the Project site (CNDDB 2008).
Circus cyaneus Northern harrier	—/SSC	Winter resident throughout most of the state; year-round in the Central Valley and Coast Range. Forages in marshes, grasslands, and ruderal habitats; nests in extensive marshes and wet fields or grasslands.	**High.** Habitat assessment surveys for the northern harrier and other avian species were conducted by PG&E biologists on June 12 and 13, November 30, December 5 and 7, 2006; and on June 29, 2007 (PG&E 2007). This species was detected during surveys, and was determined to have a high potential to nest and/or forage within the open grassland and agricultural habitats throughout the proposed alignment (PG&E 2007). There are no CNDDB-recorded occurrences of this species within 5 miles of the Project site (CNDDB 2008).
Coccyzus americanus occidentalis Western yellow-billed cuckoo	—/CE	Nests in riparian forests along broad, lower floodplains of larger river systems. Requires broad, well-developed, low-elevation riparian woodlands of primarily mature cottonwoods and willows. Extirpated from a large portion of the historical range in California with current breeding populations restricted to four major areas (the Sacramento Valley,	**Moderate.** Habitat assessment surveys for the western yellow-billed cuckoo and other avian species were conducted by PG&E biologists on June 12 and 13, November 30, December 5 and 7, 2006; and on June 29, 2007 (PG&E 2007). Although this species was not observed during surveys, it was determined to have a moderate potential to nest and/or forage within the mature riparian habitat that occurs along the proposed alignment for Line 407 West (PG&E 2007) and is therefore assumed present. There are no CNDDB-recorded occurrences of this species within 5 miles of the Project site (CNDDB 2008).

Scientific Name Common name	Listing Status USFWS/ CDFG	General Habitat Description	Potential for Impacts
		Kern River, Lower Colorado River and the Prado Basin).	
Elanus leucurus White-tailed kite	—/SSC, CFP	Nests or roosts in dense, broad-leafed deciduous trees. Forages in herbaceous lowlands with variable tree growth and dense populations of voles.	**High.** Habitat assessment surveys for the white-tailed kite and other avian species were conducted by PG&E biologists on June 12 and 13, November 30, December 5 and 7, 2006; and on June 29, 2007 (PG&E 2007). This species was observed during surveys and suitable nesting and foraging habitat was confirmed throughout the scattered trees, open grasslands, and agricultural areas along the proposed alignment (PG&E 2007). Some of the 1,967 potential nesting trees within 250 feet of the proposed Project, 206 of which occur within the Project site, may be suitable for this species. There are several CNDDB-recorded occurrences of this species within 5 miles of the Project site (CNDDB 2008).
Grus canadensis tabida Greater sandhill crane	—/CT, CFP	Breeds in wetlands and forages in meadows, irrigated pastures, fields, and marshes. Roost together at night in shallow water and commonly feed on grains, seeds, aquatic invertebrates, insects, small reptiles, amphibians, and rodents. Historically wintered on California's Central Valley wetlands. Currently winters in lowland areas of Sacramento, San Joaquin, and Imperial Valleys.	**Moderate.** Habitat assessment surveys for the greater sandhill crane and other avian species were conducted by PG&E biologists on June 12 and 13, November 30, December 5 and 7, 2006; and on June 29, 2007 (PG&E 2007). Although this species was not observed during surveys, it was determined to have a moderate potential to winter within the open grassland and agricultural habitat that occurs throughout the proposed alignment (PG&E 2007). There are no CNDDB-recorded occurrences of this species within 5 miles of the Project site (CNDDB 2008).

Scientific Name Common name	Listing Status USFWS/ CDFG	General Habitat Description	Potential for Impacts
Haliaeetus leucocephalus Bald eagle	—/CE, CFP	Year-round at ocean shorelines, lake margins, and river courses. Nests in large, old-growth, or dominant live tree with open branches, especially ponderosa pine.	**Moderate.** No breeding habitat occurs within the Project site. Habitat assessment surveys for bald eagle and other avian species were conducted by PG&E biologists on June 12 and 13, November 30, December 5 and 7, 2006; and on June 29, 2007 (PG&E 2007). This species was not detected during habitat assessment surveys and no breeding habitat was determined to exist on or in the vicinity of the Project site. However, this species was determined to have a moderate potential to migrate and potentially forage through the general Project area (PG&E 2007). There are no CNDDB-recorded occurrences of this species within 5 miles of the Project site (CNDDB 2008).
Lanius ludovicianus Loggerhead shrike	—/SSC	Found in a variety of habitats with open areas, available perches, and dense shrubs for nesting.	**Moderate.** Habitat assessment surveys for the loggerhead shrike and other avian species were conducted by PG&E biologists on June 12 and 13, November 30, December 5 and 7, 2006; and on June 29, 2007 (PG&E 2007). This species was not detected during surveys, however suitable foraging and nesting habitat was determined to exist within the Project site. Therefore, this species was determined to have a moderate potential to nest and forage within the Project site. There are no CNDDB-recorded occurrences of this species within 5 miles of the Project site (CNDDB 2008).
Numenius americanus Long-billed curlew	—/SSC	Breeds in upland shortgrass prairies and wet meadows in northeastern California; coastal estuaries, open grasslands, and croplands are used in winter	**Moderate.** Habitat assessment surveys for the long-billed curlew and other avian species were conducted by PG&E biologists on June 12 and 13, November 30, December 5 and 7, 2006; and on June 29, 2007 (PG&E 2007). Although this species was not observed during surveys, it was determined to have a moderate potential to winter within the open grassland and agricultural habitat that occurs throughout the proposed alignment (PG&E

Scientific Name Common name	Listing Status USFWS/ CDFG	General Habitat Description	Potential for Impacts
			2007). There are no CNDDB-recorded occurrences of this species within 5 miles of the Project site (CNDDB 2008).
Plegadis chihi White-faced ibis	—/SSC	Feeds in emergent wetlands (often freshwater), wet meadows, flooded pastures or croplands. Nest sites are located in dense emergent wetlands. Usually forms small nesting colonies. Recently documented population recovery (>6,000) within the Kern NWR (San Joaquin Valley) after marsh restoration efforts. Ranges across southwestern North America.	**High.** Habitat assessment surveys for the white-faced ibis and other avian species were conducted by PG&E biologists on June 12 and 13, November 30, December 5 and 7, 2006; and on June 29, 2007 (PG&E 2007). This species was observed along the Line 407 East segment during surveys, and was determined to have a high potential to nest and/or forage within the wetland habitat, grasslands, and agricultural fields that occur throughout the proposed alignment (PG&E 2007). Nesting habitat in the area is marginal due to narrow and sparse nature of emergent wetland vegetation; breeding is not likely to occur. There are CNDDB-recorded occurrences of this species within 5 miles of the Project site (CNDDB 2008).
Progne subis Purple martin	—/SSC	Nests in open and semi-open areas, including savannas, cultivated lands, fields, parks, pastures. Found near lakes, marshes, towns and suburbs. Utilizes natural cavities in trees and cliff niches. Additionally will nest in artificial housing, structures, or landscape features. Often forms colonies.	**Moderate.** Habitat assessment surveys for the purple martin and other avian species were conducted by PG&E biologists on June 12 and 13, November 30, December 5 and 7, 2006; and on June 29, 2007 (PG&E 2007). Although this species was not observed during surveys, it was determined to have a moderate potential to nest and/or forage within the scattered isolated trees, small tree groves, and anthropogenic structures that occur along the proposed alignment (PG&E 2007). There are no CNDDB-recorded occurrences of this species within 5 miles of the Project site (CNDDB 2008).
Riparia riparia Bank swallow	—/CT	In summer, restricted to riparian, lacustrine, and coastal areas with vertical banks, bluffs, and cliffs with fine-textured or sandy soils, into which	**Moderate.** Habitat assessment surveys for the bank swallow and other avian species were conducted by PG&E biologists on June 12 and 13, November 30, December 5 and 7, 2006; and on June 29, 2007 (PG&E 2007). Although this species was not

Scientific Name Common name	Listing Status USFWS/ CDFG	General Habitat Description	Potential for Impacts
		it digs nesting holes. In migration, flocks with other swallows over many open habitats.	observed during surveys, suitable nesting and foraging habitat was confirmed throughout the vertical or near vertical canals and stream banks along the proposed alignment (PG&E 2007). There are several CNDDB records of the species in the project area (records are along the large river systems in the region). There are CNDDB-recorded occurrences of this species within 5 miles of the Project site (CNDDB 2008).
Mammals			
Antrozous pallidus Pallid bat	—/SSC	Broadly distributed in California from sea level to over 6,000 feet. Roosts in caves, buildings, rock crevices, and tree hollows. Overwinters in summer habitats at lower elevations.	**Moderate.** Habitat assessment surveys for the pallid bat and other mammalian species were conducted by PG&E biologists on June 12 and 13, November 30, December 5 and 7, 2006; and on June 29, 2007 (PG&E 2007). This species was not observed during surveys; however, it was determined to have a moderate potential to roost and forage throughout the anthropogenic structures, riparian areas, and scattered trees and groves within the proposed alignment (PG&E 2007). There are CNDDB-recorded occurrences of this species within 5 miles of the Project site (CNDDB 2008).
Lasiurus blossvillii Western red bat	—/SSC	Solitary, foliage-roosting bat. Day roosts in edge habitats adjacent to streams or open fields, in orchards, and sometimes in urban areas. Closely associated with riparian habitats; cottonwood stands are considered preferred roost sites. Migrate south in the winter, and return north for breeding. Forage through a wide range of habitat types, feeding on	**Moderate.** Suitable roosting and foraging habitat occurs within the project site. This species is known to occur along the Sacramento River. Suitable roost sites and foraging habitat occurs within the scattered trees, woodland and forest habitats, and riparian and aquatic habitats that occur throughout the proposed alignment. There are no CNDDB-recorded occurrences of this species within 5 miles of the Project site (CNDDB 2008).

Scientific Name Common name	Listing Status USFWS/ CDFG	General Habitat Description	Potential for Impacts
		moths, beetles, bees, wasps, flies, cicadas, treehoppers, and other sucking insects.	
Lasionycteris noctivagans Silver-haired bat	—/SSC	Occur throughout North America scarce through much of its range, and never very abundant. Migratory, moving north through Arizona and New Mexico in the spring. Will use buildings when migrating in prairie states.	**Moderate.** Suitable roost sites and foraging habitat occurs within the scattered trees, woodland and forest habitats, and riparian and aquatic habitats that occur throughout the proposed alignment. This species has a moderate potential to occur based on the presence of suitable habitat and proximity of the Project site to known occurrences. There are CNDDB-recorded occurrences of this species within 5 miles of the Project site (CNDDB 2008).
Taxidea taxus American badger	—/SSC	Herbaceous, shrub, and open stages of most habitats with dry, friable soils.	**High.** Habitat assessment surveys for the American badger and other mammalian species were conducted by PG&E biologists on June 12 and 13, November 30, December 5 and 7, 2006; and on June 29, 2007 (PG&E 2007). A dead badger was observed on I-505 within the vicinity of the project site during surveys. This species was determined to have a moderate potential to occur within the proposed alignment for Line 406 West near the Dunnigan Hills (PG&E 2007). There are CNDDB-recorded occurrences of this species within 5 miles of the Project site (CNDDB 2008).

Fisheries

The special-status fish species reviewed for this document are listed in Table 4.4-4. This list was compiled based upon query results from the CNDDB, as well as species lists obtained from the USFWS and the National Marine Fisheries Service (NOAA Fisheries Service, or NMFS), as provided in the fish habitat assessment effort for the proposed Project. CNDDB-recorded occurrences of special-status fish species within 5 miles of the Project site are shown in Figure 4.4-2.

Regionally-occurring species were determined not to have potential to occur within the Project site either because the distribution of the species does not extend into the Project study area, or because the important habitat elements required by the species are not present.

Reconnaissance-level surveys were conducted as part of a fish habitat assessment for the proposed Project by TRC Companies, Inc on July 20, 2006 and June 21, 2007 (Appendix E-7). The surveys targeted portions of the proposed alignment and vicinity that have the potential to support special-status fish species known to the region and their habitat. Specific conditions that were considered during the fish habitat assessment included important habitat suitability elements such as seasonal flow and water quality characteristics, riparian cover, substrate composition, and accessibility of the waterway, including the presence of any in-stream structures that may create barriers to fish passage.

Seven special-status fish species were determined likely to occur within the Project site within all or portions of the year: green sturgeon (*Acipenser medirostris*), river lamprey (*Lampetra ayresii*), Central Valley steelhead (*Oncorhynchus mykiss*), Central Valley fall- and late-fall-run chinook (*Oncorhynchus tsawytscha*), Central Valley spring-run chinook (*Oncorhynchus tsawytscha*), Sacramento River winter-run chinook (*Oncorhynchus tsawytscha*), and Sacramento splittail (*Pogonichthys macrolepidotus*).

Table 4.4-4 Special-Status Fish Species Assessment Table

Scientific Name Common name	Listing Status NMFS-USFWS/ CDFG	General Habitat Description	Potential for Impacts
Fish			
Acipenser medirostris Green sturgeon	FT/SSC	Anadromous species; large portions of life history are spent in the ocean. Migrations by adults into freshwater occur between late February and late July, with a spawning period generally ranging from March to July. Spawning takes place in deep, fast-moving water with temperatures between 46.5 and 57 degrees Fahrenheit (deg. F). Preferred spawning substrate is likely large cobble, but can range from clean sand to bedrock. Juveniles typically migrate out to sea before the end of their second year, primarily during summer and fall.	**High.** This species has the potential to occur within the Sacramento River between February and July. There are no CNDDB-recorded occurrences of this species within 5 miles of the Project (CNDDB 2008).
Lampetra ayresii River lamprey	—/SSC	Lampreys are anadromous, entering the ocean in late spring and spending three to four months in saltwater before migrating back to freshwater in autumn. Spawning takes place between February and May in tributary streams to select	**High.** Potential to occur within the Sacramento River year-round and potentially the Yolo Bypass during wet months.

Scientific Name Common name	Listing Status NMFS-USFWS/ CDFG	General Habitat Description	Potential for Impacts
		larger rivers (Sacramento/San Joaquin). Presumably, adults need clean, gravelly riffles in permanent streams for spawning. Ammocoetes require sandy, silty backwaters or stream edges in which to bury themselves, where water quality is continuously high and temperatures do not exceed 77 deg. F.	
Oncorhynchus mykiss Central Valley steelhead	FT/—	Steelhead trout in the Central Valley enter freshwater from the ocean when winter rains provide large amounts of cold water for migration and spawning. They typically spawn in clean gravel within tributaries to mainstem rivers and return to the ocean after spawning, if possible. For one to two years after hatching, juveniles are found in cool, clear, fast-moving permanent streams and rivers where there is ample riparian cover or undercut banks, and where invertebrate life is abundant.	**High.** Potential to occur within the Sacramento River year-round and potentially the Yolo Bypass and Steelhead Creek during wet months. Critical habitat for the Central Valley steelhead has been designated in the Sacramento River, Yolo Bypass, and in Steelhead Creek approximately 6 miles south of the project crossing site. There are no CNDDB-recorded occurrences of this species within 5 miles of the Project (CNDDB 2008).

Scientific Name Common name	Listing Status NMFS-USFWS/ CDFG	General Habitat Description	Potential for Impacts
Onchorhynchus tshawytscha Central Valley spring-run chinook	FT/CT	Spring-run chinook salmon enter the Sacramento River as immature fish in spring and early summer and migrate into headwaters where they hold in pools until they spawn. Juveniles emerge from early November through the following April, and typically rear in freshwater for 3 to 15 months. Juveniles emigrate from the tributaries to estuarine waters and the ocean between mid November and June. Some fish remain in the stream until the following October and emigrate as yearlings, usually with the onset of storms starting in October through the following March. Optimal temperatures for growth and survival of chinook range between 41 and 66 deg. F. At approximately 71 to 73 deg. F, major mortality is experienced in wild populations.	**High.** Potential to occur within the Sacramento River year-round and potentially the Yolo Bypass and Steelhead Creek during wet months. Critical habitat has been designated in the Sacramento River and in the Yolo Bypass. There are no CNDDB-recorded occurrences of this species within 5 miles of the Project (CNDDB 2008).
Oncorhynchus tshawytscha Central Valley fall- and late-fall-run chinook	—/SSC	Fall-run chinook migration into freshwater occurs in late summer and early fall. Valley reaches of rivers are often too warm to support salmon in summer. Spawning	**High.** Potential to occur within the Sacramento River year-round and potentially the Yolo Bypass and Steelhead Creek during wet months. There are no CNDDB-recorded occurrences of this species within 5 miles of the Project (CNDDB 2008).

Scientific Name Common name	Listing Status NMFS-USFWS/ CDFG	General Habitat Description	Potential for Impacts
		typically occurs on gravel bars within a few days or weeks of entering freshwater. Adults die after spawning. Late-fall-run chinook typically enter the river as four- to five-year-old fish beginning in October, and hold in freshwater for one to three months before spawning. Adapted for spawning in reaches of mainstem rivers, such as the upper Sacramento, which remain cold and deep enough in summer months for rearing of juveniles. Juveniles typically migrate to the ocean after 7 to 13 months in freshwater.	
Onchorhynchus tshawytscha Central Valley winter-run chinook	FE/CE	Winter-run chinook typically migrate upstream as immature fish during winter and spring, then spawn several months later in summer. Most winter-run chinook return to freshwater as three-year-olds, and spawn in clear, cool water released from Shasta Reservoir. Juveniles remain in fresh water for 5 to 10 months, followed by an intermediate time in estuarine waters before entering the ocean. Optimal	**High.** Potential to occur within the Sacramento River year-round and potentially the Yolo Bypass and Steelhead Creek during wet months. Critical habitat for winter-run chinook has been designated in the Sacramento River from Kenswick Dam to the San Francisco Bay. There are no CNDDB-recorded occurrences of this species within 5 miles of the Project (CNDDB 2008).

Scientific Name Common name	Listing Status NMFS-USFWS/ CDFG	General Habitat Description	Potential for Impacts
		temperatures for growth and survival of chinook range between 41 and 66 deg. F.	
Pogonichthys macrolepidotus Sacramento splittail	—/SSC	Sacramento splittail are primarily freshwater fish but can tolerate low salinities. They are commonly found in temperatures ranges from 41 to 75 deg. F, but can tolerate temperatures up to 91.5 deg. F for short periods. Adults move upstream during the winter and spring to forage and spawn. Spawning occurs between late February and early July in areas of flooded vegetation (Yolo and Sutter bypasses, low-lying parts of delta islands, and river mouths), though it is most frequent in March and April. Most splittail larvae remain near the spawning sites for 10 to 14 days before moving into offshore habitats.	**High.** Potential to occur within the Sacramento River in the winter and spring, and potentially within the Yolo Bypass during wet months. There are CNDDB-recorded occurrences of this species within the Project site in the Sacramento River (CNDDB 2008).

Invasive Plant Species

California's long history of settlement from oversea countries resulted in the introduction of many non-native plant species. Most non-native plants that were introduced early in California's history first established at coastal sites near ports and around missions and other settlements (Bossard et al 2000). These introduced species spread rapidly throughout the state with the movement of goods and people, but also greatly though movement of grazing livestock. A 1998 estimate puts the number of non-native plant species within the state at 1,045 (Bossard 35 al 2000).

There are many non-native species that occur throughout the Sacramento Valley that are represented in the project study area. They include the common non-native plant species such as filaree (*Erodium*), brome grasses (*Bromus*), oat grasses (*Avena*), mustards (*Brassica*, *Raphanus*, etc.), and clovers (*Trifolium*, *Medicago*, *Melilotus*, etc.) among others. However, there are also several non-native plant species present within the study area that are considered noxious weeds, which have potential to result in significant changes to the plant communities in which they occur. Noxious plant species that occur regionally in upland habitats include Chinese tallow (*Sapium sebifera*), tree-of-heaven (*Ailanthus altissimum*), yellow star-thistle (*Centaurea solstitialis*), medusa-head grass (*Taeniatherum caput-medusae*), fennel (*Foeniculum vulgare*), and barbed goatgrass (*Aegilops triuncialis*). With the exception of Chinese tallow and barbed goatgrass, all of these species have been reported in technical reports as occurring within the project study area. There are also several noxious plant species that occur regionally in wetland habitats. They include giant reed (*Arundo donax*), red sesbania (*Sesbania punicea*), Spanish broom (*Spartium junceum*), Pampas grass (*Cortaderia seloana*), manna grass (*Glyceria declinata*), and floating primrose-willow (*Ludwigia peploides*). Of these, only giant reed and floating primrose-willow were observed within the study area. Noxious weeds are spread by mechanical equipment, and the resulting disturbance often facilitates successful establishment of these species into new areas.

4.4.2 Regulatory Setting

Federal

Special-Status Species

<u>Federal Endangered Species Act (ESA)</u>

The USFWS (and NMFS for anadromous fish species) administers the Federal ESA, which provides a process for listing species as either threatened or endangered, and methods of protecting them. The ESA defines as “endangered” any plant or animal species that is in danger of extinction throughout all or a significant portion of its range. A “threatened” species is a species that is likely to become endangered in the near future. A “proposed” species is one that has been officially proposed by USFWS for addition to the Federal threatened and endangered species list.

Section 9 of the ESA prohibits “take” of threatened or endangered species. The term “take” means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in such conduct. The presence of any federally threatened or endangered species that are in a Project area generally imposes severe constraints on development, particularly if development would result in “take” of the species or its habitat. Under the regulations of the ESA, the USFWS may authorize “take” when it is incidental to, but not the purpose of, an otherwise lawful act.

<u>The Bald and Golden Eagle Protection Act</u>

The Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c), enacted in 1940, and amended several times since then, prohibits anyone, without a permit issued by the Secretary of the Interior, from “taking” bald eagles, including their parts, nests, or eggs. The Act provides criminal penalties for persons who “take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle [or any golden eagle], alive or dead, or any part, nest, or egg thereof.” The Act defines “take” as “pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb.”

For purposes of these guidelines, “disturb” means: “to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.”

In addition to immediate impacts, this definition also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle's return, such alterations agitate or bother an eagle to a degree that interferes with or interrupts normal breeding, feeding, or sheltering habits, and causes injury, death or nest abandonment.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) makes it unlawful to pursue, capture, kill, or possess or attempt to do the same to any migratory bird or part, nest, or egg of any such bird listed in wildlife protection treaties between the United States, Great Britain, Mexico, Japan, and the countries of the former Soviet Union.

Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996, requires Federal agencies to consult with NMFS on activities that may adversely affect Essential Fish Habitat (EFH). In addition, the law requires fishery management councils to include descriptions of EFH and potential threats to EFH in all Federal fishery management plans. The Pacific Fishery Management Council amended the Pacific Coast Salmon Plan in 2000 to include descriptions of EFH for different salmonid species. EFH for chinook salmon was defined for freshwater, estuarine, and marine waters.

Freshwater EFH for chinook salmon consists of five major components, including spawning and incubation, juvenile rearing, juvenile migration corridors, and adult migration corridors and adult holding habitat. Important features of essential habitat for spawning, rearing, and migration include substrate composition, water quality, water quantity, depth and velocity, channel gradient and stability, food, cover and habitat complexity, space, access and passage, and floodplain and habitat connectivity.

Chinook salmon EFH includes all those streams, lakes, ponds, wetlands, and other waterbodies currently or historically accessible to salmon in Washington, Oregon, Idaho, and California. Salmon EFH excludes areas upstream of longstanding naturally impassible barriers (i.e., natural waterfalls in existence for several hundred years), but includes aquatic areas above all artificial barriers except specifically cited impassible dams.

Pacific Coast Salmon Plan

The Pacific Coast Salmon Plan guides management of commercial and recreational salmon fisheries off the coasts of Washington, Oregon, and California. This fishery management plan covers the coastwide aggregate of natural and hatchery salmon species that is contacted by salmon fisheries in the exclusive economic zone (EEZ) off the coasts of Washington, Oregon, and California. In addition, the plan contains requirements and recommendations with regard to EFH for the managed stocks.

The EFH includes marine areas within the EEZ, as well as estuarine and freshwater habitat within the internal waters of Washington, Oregon, California, and Idaho.

While all species of salmon fall under the jurisdiction of this plan, it currently only contains fishery management objectives for chinook, Coho, pink (odd-numbered years only), and any salmon species listed under the Federal ESA that is measurably impacted by Pacific Fishery Management Council fisheries.

Waters of the U.S., Including Wetlands

Clean Water Act

Section 404 of the Federal Clean Water Act, which is administered by U.S. Army Corps of Engineers (USACE), regulates the discharge of dredge and fill material into waters of the United States (U.S.). The USACE has established a series of nationwide permits that authorize certain activities in waters of the U.S., if a proposed activity can demonstrate compliance with standard conditions. Normally, the USACE requires an individual permit for an activity that would affect an area equal to or in excess of 0.5 acre of waters of the U.S. Projects that result in impacts to less than 0.5 acre can normally be conducted pursuant to one of the nationwide permits, if consistent with the standard permit conditions. The USACE also has discretionary authority to require an Environmental Impact Statement for Projects that result in impacts to an area between 0.1 and 0.5 acre. Use of any nationwide permit is contingent on the activities having no impacts to endangered species.

Section 401 of the Clean Water Act requires that "any applicant for a federal permit for activities that involve a discharge to waters of the State shall provide the federal permitting agency with a certification from the State, in which the discharge is proposed, that states the discharge will comply with the applicable provisions under the federal Clean Water Act." Therefore, before the USACE will issue a Section 404 Permit, applicants must apply for and receive a Section 401 Water Quality Certification from the Regional Water Quality Control Board (RWQCB).

State

Special-Status Species

California Endangered Species Act (CESA)

The CDFG administers the CESA. The State of California considers an endangered species as one whose prospects of survival and reproduction are in immediate jeopardy. A threatened species is considered as one present in such small numbers throughout its range that it is likely to become an endangered species in the near future in the absence of special protection or management. A rare species is one that is considered present in such small numbers throughout its range that it may become endangered if its present environment worsens. Section 2080 of the Fish and Game Code prohibits "take" of any species that the commission determines to be an endangered species or a threatened species. Take is defined in section 86 of the Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." The California Endangered Species Act (CESA) allows for take incidental to otherwise lawful development projects. CESA emphasizes early consultation to avoid potential impacts to rare, endangered, and threatened species and to develop appropriate mitigation planning to offset project caused losses of listed species populations and their essential habitats. Sections 2081(b) and (c) of the CESA allow the Department to issue an incidental take permit for a State listed threatened and endangered species only if specific criteria are met.

<u>CEQA Guidelines Section 15380</u>

Threatened and endangered species are protected by specific Federal and State statutes. In addition, the CEQA Guidelines section 15380 provides that a species not listed on the Federal or State lists of threatened or endangered species may be considered rare or endangered under CEQA review if the species can be shown to meet certain specified criteria.

Sensitive plant species are afforded protection under CEQA through the CNPS inventory of rare, threatened, and endangered plants of California. CNPS is a California resource conservation organization that has developed an inventory of California's sensitive plant species. This inventory summarizes information on the distribution, rarity, and endangerment of California's vascular plants. The inventory is divided into four lists based on the rarity of the species. In addition, the CNPS provides an inventory of plant communities that are considered sensitive by the State and Federal resource agencies, academic institutions, and various conservation groups. Determination of the level of sensitivity is based on the number and size of remaining occurrences as well as recognized threats.

<u>California Fish and Game Code, Sections 3503, and 3511, 4700 ,5050, and 5515</u>

The CDFG administers the California Fish and Game Code. There are particular sections of the Code that are applicable to natural resource management. For example, section 3503 of the Code states it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird. Section 3511 of the Code lists fully protected bird species, where the CDFG is unable to authorize the issuance of permits or licenses to take these species. Under section 4700, fully protected mammals or parts thereof may not be taken or possessed at any time. Species included in sections 5050 (reptiles and amphibians) and 5515 (fish) do not occur in the Project study area.

Native Plant Protection Act

The Native Plant Protection Act (California Fish and Game Code sections 1900-1913) prohibits taking, possessing, or selling within the state any rare, threatened, or endangered plants as defined by the CDFG. Where state-listed plants are present on private property, the CDFG must be notified 10 days prior to destruction to allow for salvage of individuals and/or populations.

Recovery Plan for the Sacramento/San Joaquin River Delta Native Fishes

The Recovery Plan for the Sacramento/San Joaquin River Delta Native Fishes (Native Fishes Recovery Plan) by NMFS includes recovery and restoration objectives for eight species of fish that utilize the Sacramento/San Joaquin Delta for a significant segment of their life history, including Central Valley spring-run chinook salmon, Central Valley fall- and late-fall-run chinook salmon, winter-run chinook salmon, Sacramento splittail, Delta smelt, and green sturgeon (USFWS 1996).

The Native Fishes Recovery Plan delineated actions believed to be necessary for the restoration and recovery of the eight species. Recovery and restoration criteria were designed to monitor the effectiveness of the recovery actions, to determine when a species has stabilized to a secure level, and to determine when a species qualifies for delisting.

Though the Native Fishes Recovery Plan was designed to monitor and restore the eight species, many of them have had further declines in numbers and have been elevated in listing status since the plan was published.

Steelhead Restoration and Management Plan for California

The purpose of the Steelhead Restoration and Management Plan for California (Steelhead Management Plan) by CDFG (CDFG 1996) is to assure the maintenance, restoration, and enhancement of California's steelhead stocks. The Steelhead Management Plan provides guidelines for steelhead restoration and management to be integrated into current and future planning processes for specific river and stream systems. It also identifies those needs specific to steelhead and is intended to augment current anadromous fish restoration plans.

The Steelhead Management Plan focuses on restoration of native and wild stocks of steelhead, as these stocks have the greatest value for the species as a whole in terms of maintaining genetic and biological diversity.

The Steelhead Management Plan focuses on the following five strategies to restore native stocks of steelhead:

- Restore degraded habitat;
- Restore access to historic habitat that is presently blocked;
- Review angling regulations to ensure that steelhead adults and juveniles are not over-harvested;
- Maintain and improve hatchery runs, where appropriate; and
- Develop and facilitate research to address deficiencies in information on freshwater and ocean life history, behavior, habitat requirements, and other aspects of steelhead biology.

The Steelhead Management Plan includes recommendations for the management of American River stocks of steelhead, including Steelhead Creek and Dry Creek.

Waters and Wetlands

<u>Clean Water Act - Section 401</u>

Per section 401 of the Clean Water Act (CWA), "any applicant for a Federal permit for activities that involve a discharge to waters of the State, shall provide the Federal permitting agency a certification from the State in which the discharge is proposed that states that the discharge will comply with the applicable provisions under the Federal Clean Water Act." Therefore, before the USACE will issue a Section 404 Permit, applicants must apply for and receive a Section 401 Water Quality Certification from the RWQCB.

<u>California Wetlands Conservation Policy</u>

In August 1993, the Governor announced the "California Wetlands Conservation Policy." The goals of the policy are to establish a framework and strategy that will:

- Ensure no overall net loss and achieve a long-term net gain in the quantity, quality, and permanence of wetlands acreage and values in California in a manner that fosters creativity, stewardship, and respect for private property.
- Reduce procedural complexity in the administration of State and federal wetlands conservation programs.
- Encourage partnerships to make landowner incentive programs and cooperative planning efforts the primary focus of wetlands conservation and restoration.

The Governor also signed Executive Order W-59-93, which incorporates the goals and objectives contained in the new policy and directs the Resources Agency to establish an Interagency Task Force to direct and coordinate administration and implementation of the policy.

<u>Porter-Cologne Water Quality Act</u>

The RWQCB regulates actions that would involve "discharging waste, or proposing to discharge waste, within any region that could affect the water of the state" (California Water Code section 13260(a)), pursuant to provisions of the Porter-Cologne Water Quality Act. "Waters of the State" are defined as "any surface water or groundwater, including saline waters, within the boundaries of the state" (California Water Code 13050 (e)).

<u>California Fish and Game Code, Sections 1600 through 1603</u>

All diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake in California are subject to the regulatory authority of the CDFG pursuant to sections 1600 through 1603 of the Fish and Game Code, requiring preparation of a Streambed Alteration Agreement. Under this Code, a stream is defined as a body of water that flows at least periodically, or intermittently, through a bed or channel having banks and supporting fish or other aquatic life. Included are watercourses with surface or subsurface flows that support or have supported riparian vegetation. Additionally, the CDFG has jurisdiction over altered or artificial waterways as well as dry washes that carry water ephemerally during storm events based on the biological value of these drainages to fish and wildlife. Of the non-federally jurisdictional water features in the Project study area, approximately 3.2 acres have been identified as potentially CDFG jurisdictional features: Hungry Hollow Canal, Acacia Canal, five unnamed irrigation canals, three agricultural drainage ditches, and one roadside drainage.

Oak Woodlands

In September 2004, the State of California approved Senate Bill No. 1334 (Kuehl), The Oak Woodlands Conservation Act. This act requires that a county, in determining whether CEQA requires an environmental impact report, negative declaration, or mitigated negative declaration; also determine whether a project in its jurisdiction may result in a conversion of oak woodlands that would have a significant effect on the environment. If the county determines that there may be a significant effect to oak woodlands, the county shall require one or more mitigation alternatives to mitigate the significant effect of the conversion of oak woodlands. These include conserving oak woodlands through conservation easements, or contributing funds into the Oak Woodlands Conservation Fund, as established under subdivision (a) of section 1363 of the Fish and Game Code, for the purpose of purchasing oak woodlands conservation easements. A portion of mitigation (no more than one-half) may also include planting an appropriate number of trees, including maintaining plantings for 7 years and replacing any dead or diseased trees. Other mitigation measures developed by the county may also be required.

Swainson's Hawk

The Staff Report Regarding Mitigation for Impacts to Swainson's Hawks (*Buteo swainsoni*) in the Central Valley of California (Swainson's Hawk Staff Report) was prepared in 1994 (CDFG 1994) for use in project review under CEQA. Mitigation measures contained in the Swainson's Hawk Staff Report are intended to reduce a project's impact to Swainson's hawk to less than significant levels. No intensive new disturbances or other project-related activities that may cause nest abandonment or forced fledging should be initiated within a 0.25-mile buffer of an active nest between March 1 and September 15. The buffer zone should be increased to 0.5 mile in nesting areas away from urban development. Nest trees should not be removed unless there is no feasible way of avoiding them.

To mitigate for the loss of foraging habitat, CDFG mitigation guidelines stipulate that projects within 1 mile of an active nest tree shall provide 1 acre of habitat management land for each acre of development authorized where 10 percent of the land is active managed for habitat; or 0.5 acre of habitat management land for each acre of development authorized where 100 percent of the land is actively managed for habitat. Projects located between 1 and 5 miles of an active nest tree shall provide 0.75 acre of habitat management land for each acre of development authorized; projects located between 5 and 10 miles of an active nest tree shall provide 0.5 acre of habitat management land for each acre of development authorized.

Local

Local conservation plans and policies are included below. County General Plan goals, policies, and objectives were also evaluated in preparation of this DEIR; however, due to their length they are appended to this DEIR (see Appendix E-14).

Natomas Basin Habitat Conservation Plan

The Natomas Basin Habitat Conservation Plan (NBHCP) applies to the 53,341-acre interior of the Natomas Basin, located in the northern portion of Sacramento County and the southern portion of Sutter County (City of Sacramento et al. 2003). The Natomas Basin contains incorporated and unincorporated areas within the jurisdiction of the City of Sacramento, Sacramento County, and Sutter County. The purpose of the NBHCP is to promote biological conservation along with economic development and the continuation of agriculture within the Natomas Basin. The NBHCP establishes a multi-species conservation program to mitigate the expected loss of habitat values and incidental take of protected species that would result from urban development, operation of irrigation and drainage systems, and rice farming. The goal of the NBHCP is to preserve, restore, and enhance habitat values found in the Natomas Basin while allowing urban development to proceed according to local land use plans.

The primary biological goal of the NBHCP is to create a system of reserves, with both wetland and upland components, that would support viable populations of the giant garter snake, Swainson’s hawk and other covered species. The NBHCP primarily focuses preservation efforts on the giant garter snake and Swainson’s hawk. The habitat needs of the other covered species overlap significantly with the giant garter snake and the Swainson’s hawk such that specific habitat requirements of the other covered species can be incorporated and met within the upland and wetland components of the reserves focused on providing Swainson’s hawk and giant garter snake habitats. Specific consideration of the needs of the other covered species are incorporated into the restoration, enhancement, and management plans as they are developed for each reserve site according to criteria outlined in the NBHCP.

Sacramento County Code Relating to the Swainson's Hawk Impact Mitigation Program

In April 2006, the Sacramento County Board of Supervisors passed Sacramento County Code 1328, the intent of which is to prevent the unchecked loss of foraging habitat for Swainson's hawk resulting from urban growth. County Code 1328 applies to any requests (1) for a change in land use designation from Agricultural Designation AR-1, AR-2, or AR-5 to an Urban Designation; (2) to rezone agriculturally designated lands to an agricultural designation that permits smaller minimum parcel sizes; (3) for a land use entitlement for a non-agricultural use of land zoned with an Agricultural Designation; (4) for a land use entitlement for a non-agricultural use of land or public project located within the boundaries of the Elverta Specific Plan or Rancho Murieta's Urban Services Boundary; or (5) to any public improvement project proposed by any department or agency of Sacramento County on land with an Agricultural Designation; and (6) to subdivide five acres or more of contiguous land zoned as an Urban Designation to less than five acres.

For projects impacting 40 acres of habitat or more, preservation of one acre through conservation easement or fee title is required for each acre impacted. For projects determined to impact less than 40 acres, impacts may be mitigated through preservation of one acre for each acre impacted, or by payment of a Swainson's hawk impact mitigation fee per acre of calculated habitat impact to the County in the amount set for in Chapter 16.130.050 of the Sacramento County Code.

Yolo County Oak Woodland Conservation and Enhancement Plan

The Yolo County Oak Woodland Conservation and Enhancement Plan promotes voluntary efforts to conserve and enhance the County's existing oak woodlands. This plan applies to existing and former oak woodlands that cover 1 acre or more. Under the Plan, Yolo County would focus on supporting the existing efforts of willing landowners, non-profit organizations, and government agencies to enhance and conserve oak woodlands. In addition, Yolo County would assist these individuals and organizations in accessing funds for voluntary oak woodlands conservation and enhancement activities.

Agreement Regarding Mitigation for Impacts to Swainson's Hawk

Yolo County has entered into an agreement with the CDFG and the Yolo County HCP/Natural Community Conservation Plan (NCCP) Joint Powers Agency regarding Mitigation for Impacts to Swainson's Hawk Foraging Habitat in Yolo County. The intent of the agreement is to continue to provide for mitigation of impacts to Swainson's hawk consistent with CEQA through acquisition and protection of Swainson's hawk foraging habitat. The Agreement is an interim measure to protect habitat while work continues on a County-wide NCCP. The Agreement requires urban development permittees to pay an acreage-based mitigation fee in an amount sufficient to fund the acquisition, enhancement, and long-term management of Swainson's hawk foraging habitat at the ratio of 1 acre acquired for each acre lost. In addition, consultation with the CDFG is required for projects that will be located within 0.5 mile of a Swainson's hawk nest tree, the purpose of which is to determine whether the project may result in incidental take of Swainson's hawk.

Placer County Tree Preservation Ordinance

The Placer County Tree Preservation Ordinance requires a permit, except for exempted circumstances, for activities impacting any native California tree with a single main stem or trunk at least 6 inches in diameter at breast height (dbh), or with a multiple trunk having an aggregate of at least 10 inches dbh. Permitted activities include activities conducted within the protected zone of any protected tree, or any activities that would harm, destroy, kill, or remove any protected tree. The permit application requires, in part, a site plan map, an arborist report, and a justification statement. Mitigation measures are required for trees designated to be saved that are located within 50 feet of any development activity. Permit approval may require replacement of trees removed, implementation of a revegetation plan, or payment into a tree preservation fund.

Sutter County

<u>Conservation Banks and Regional Habitat Conservation Plans</u>

River Ranch Conservation Bank

The River Ranch Conservation Bank, managed by Wildlands, Inc. (Wildlands), is a 76-acre mitigation bank west of the Sacramento River and on both sides of CR-16 in Yolo County. It provides permanent habitat for the threatened valley elderberry longhorn beetle (VELB). The bank is within a 3,682-acre property owned by the Sacramento River Ranch, LLC. The bank sells conservation credits for the loss of VELB and Swainson's hawk habitat within the primary service area, which includes all of Sutter, most of Sacramento, and smaller portions of Yolo and Placer counties. Wildlands has plans to open two additional portions of the River Ranch VELB Conservation Bank, encompassing an additional 95 acres.

Natomas Basin Habitat Conservation Plan

The Natomas Basin Habitat Conservation Plan (NBHCP) covers approximately 53,537 acres of land in northern Sacramento County and southern Sutter County that has historically been utilized for agriculture. The Natomas Basin is bound by Cross Canal on the northwest corner, the Sacramento River on the west, the American River on the south, and the Natomas East Main Drainage Canal (Steelhead Creek) on the east.

The purpose of the NBHCP is to promote biological conservation in conjunction with economic and urban development in the permit areas. The NBHCP establishes a multi-species conservation program to minimize and mitigate expected take of covered species that could result from development, including giant garter snake and Swainson’s hawk. The NBHCP requires mitigation for designated types of development within the NBHCP area boundaries, including public and private utilities. Compliance includes the requirements for land and/or fee dedication, as well as the application of measures to avoid, minimize, and mitigate the take of species covered by the NBHCP.

Placer County Conservation Plan

In 2000, the Board of Supervisors directed staff to initiate the implementation of the Placer Legacy Program. As part of that direction, staff initiated the preparation of a Natural Community Conservation Plan (NCCP) and HCP to comply with the CESA, the Federal ESA, and the Federal CWA related to wetlands. That effort, now referred to as the proposed Placer County Conservation Plan, is intended to address the impacts associated primarily with unincorporated growth in western Placer County and growth associated with the build out of the City of Lincoln’s updated general plan. Development will require the preservation of approximately 54,300 acres of land between now and 2050, and implementation and land protection measures will be managed in perpetuity.

Conservation planning within Placer County is taking place in phases. The first phase is the development of a plan for the western portion of the county. The draft plan (February 2005) specifies techniques for minimizing impacts to wetlands and aquatic ecosystems when constructing utility lines.

4.4.3 Significance Criteria

An adverse impact on biological resources is considered significant and would require mitigation as specified below.

Federally Jurisdictional Wetlands and Other Waters of the United States / Waters of the State

An adverse impact on federal or State jurisdictional wetlands and other waters of the U.S. is considered significant and would require mitigation if Project construction or operation activities would:

1. Fill or alter a jurisdictional wetland, water, or vernal pool, resulting in a long-term change in its hydrology or soils, or the composition of vegetation of a unique, rare, or special concern wetland community;

2. Cause short- or long-term violations of Federal or State water quality standards for streams that lead to wetlands, measured as in-stream elevated turbidity readings or decreased dissolved oxygen (DO) levels.

Vegetation

An adverse impact on vegetation is considered significant and would require mitigation if Project construction or operation activities would:

3. Result in the long-term (more than 5 years) reduction or alteration of unique, rare, or special concern vegetation types, riparian vegetation, or natural communities;

4. Introduce new, or lead to the expanded range of existing, invasive noxious weed species or soil pests, so that they interfere with crop production or successful revegetation of natural communities; or

5. Result in a spill or leak that would contaminate the soil to the extent of eradicating the existing vegetation, inhibiting revegetation, or migrating to other areas and affecting soil and water ecology via erosion and sedimentation.

Wildlife and Aquatic Resources

An adverse impact on wildlife and aquatic resources is considered significant and would require additional mitigation if Project construction or operation would:

6. Substantially interfere with the movement or range of migratory birds and other wildlife, or the movement, range, or spawning of any resident or anadromous fish;

7. Cause substantial deterioration of existing fish habitat for listed species;

8. Introduce new, invasive wildlife or aquatic species to an area; or

9. Create a potential health hazard or involve the use, production, or disposal of materials in a manner that would be expected to pose a hazard to wildlife or fish populations in the Project area.

Threatened, Endangered, and Special-Status Species

An adverse impact on federally or State-listed species or species proposed for listing is considered significant and would require mitigation if Project construction or operation activities would:

10. Reduce the abundance of sensitive species, including species under the protection of the Migratory Bird Treaty Act, that occur within the Project area;

11. Result in the loss or alteration of existing or proposed critical habitat for one or more listed species;

12. Cause a temporary loss or alteration of habitat important for one or more listed species that could result in avoidance by a listed species, or that could cause increased mortality or lowered reproductive success of the species;

13. Result in direct or indirect impacts on candidate or sensitive species populations, or their habitat, that would contribute to or result in the Federal or State listing of the species (e.g., substantially reducing species numbers or resulting in the permanent loss of habitat essential for the continued existence of a species); or

14. Create a potential health hazard or involve the use, production, or disposal of materials that pose a hazard to a special-status species population in the Project area.

4.4.4 Applicant Proposed Measures

Applicant Proposed Measures (APMs) were identified by PG&E in its Environmental Analysis prepared for the CSLC. APMs that are relevant to this Section are presented below. This impact analysis assumes that all APMs would be implemented as defined below. Additional mitigation measures are recommended in the following impact analysis when it is determined that APMs do not fully mitigate the impacts for which they are presented.

General Preconstruction

APM BIO-1. Worker Training: PG&E will retain a qualified biologist(s) to conduct environmental compliance training, including an endangered species/sensitive habitat education program for construction crews prior to the commencement of the Project and during construction activities. Additional "tailgate" training will be conducted for new construction personnel as needed during construction. Sessions will include discussions of regulatory requirements, including the CWA, FESA, CESA, CDFG's Fish and Game Code, permit requirements, and consequences of noncompliance with these acts and requirements. Training will also include identification of special-status species that are likely to occur in the Project area, and discussion of the values of sensitive habitats.

APM BIO-2. Educational Brochure: As part of construction training, PG&E will produce an educational brochure for crews working on the Project. Color photos of threatened and endangered species, including vernal pool invertebrates, giant garter snake (GGS), California tiger salamander (CTS), burrowing owl, Swainson's hawk, and others known or likely to occur in the area will be included, as well as a discussion of protective measures agreed to by PG&E and the resource agencies.

APM BIO-3. Exclusion Zone Fencing: PG&E will mark the boundaries of environmentally sensitive exclusion zones and sensitive habitat features that are to be avoided (wetlands, vernal pools, etc.) before and during construction with highly visible flagging or fencing to prevent impacts from vehicles. All construction personnel will be required to conduct work activities within the defined area only.

APM BIO-4. Vegetation Removal: PG&E will only remove vegetation within the approved work area. Overhanging trees may be trimmed as necessary per accepted arborist practices to safely construct the Project.

General Construction

APM BIO-5. Work Area: PG&E will confine all heavy equipment, vehicles, and construction work to approved roads and work areas. Stream channel work areas will be limited to what is absolutely necessary for construction; where possible, construction vehicles will be kept out of watercourses with the potential to support special-status species. Where these avoidance measures are not feasible, PG&E will apply for and obtain the appropriate permits prior to construction from the USACE, USFWS, CDFG, and Central Valley Regional Water Quality Control Board (CVRWQCB), and will implement any additional avoidance or mitigation measures that are agreed upon during the permitting process.

APM BIO-6. Construction Monitoring: PG&E will retain a qualified biologist(s) to be on-site during construction activities to perform pre-activity surveys just prior to construction in order to clear the work area of any special-status species, and to monitor compliance with mitigation measures. This includes monitoring in giant garter snake and vernal pool habitat areas, and in wetland and riparian habitats, as described in greater detail below.

APM BIO-7. Erosion and Dust Control: PG&E will implement erosion, sediment, material stockpile, and dust control BMPs on-site to minimize the potential for fill or runoff to enter wetlands or waterways. A biological monitor will be retained as necessary to monitor and inspect the installation and removal of erosion/sediment control devices if applicable.

APM BIO-8. Workday Schedule: To the extent possible, PG&E will conduct all construction activity during daylight hours only, with the exception of HDD, which will continue 24 hours per day, 7 days per week to minimize the potential for frac-out, and hydrostatic testing which may require holding test pressure in the pipelines past sundown. Where it is deemed necessary and feasible, night lighting and monitors will be used for work that occurs after sundown.

APM BIO-9. Vehicle Inspection: PG&E will ensure that all construction personnel are instructed to visually check for wildlife beneath vehicles and equipment before moving or operating them.

APM BIO-10. Speed Limit: PG&E will enforce a speed limit of 20 miles per hour on private roads and the posted speed limit on public roads for vehicles in sensitive habitat.

APM BIO-11. Trench Ramping: At the conclusion of each day's trenching or excavating activities, the end of the trench or bore pit will be ramped at an approximate 2 to 1 slope to allow any wildlife that falls into the trench to escape. A biological monitor may approve the use of boards placed at an approximate 2 to 1 slope for site-specific, pre-approved locations where earthen escape ramps are not feasible.

APM BIO-12. Sensitive Habitat Monitoring and Procedures if Listed Species are Found: In accordance with the FESA and CESA, PG&E will retain a USFWS-approved biological monitor to inspect any construction activity in habitat that is to be avoided or preserved to ensure that no unauthorized or unnecessary take of listed species or destruction of their habitat occurs. The biologist will have the authority to stop all activities that may result in such take or destruction until appropriate corrective measures have been completed. The biologist also will be required to report immediately any unauthorized impacts to the USFWS and the CDFG.

APM BIO-13. Spill Prevention/Containment and Refueling Precautions: PG&E will maintain all construction equipment to prevent leaks of fuels, lubricants, or other fluids into waterways. Appropriate materials will be on-site to prevent and manage spills. PG&E will take appropriate precaution when handling and/or storing chemicals (e.g., fuel and hydraulic fluid) near waterways and wetlands, and any and all applicable laws and regulations will be followed. Service and refueling procedures will take place at least 100 feet from waterways or in an upland area at least 100 feet from wetland boundaries to prevent spills from entering waterways or wetlands. These activities may be performed closer than 100 feet if a qualified biologist finds in advance that no reasonable alternative exists, and that PG&E and its contractors have taken the appropriate steps (including secondary containment) to prevent spills and provide prompt cleanup in the event of a spill. These measures will be outlined in a Hazardous Substance Control and Emergency Response Plan to be prepared by PG&E (See APM HAZ-2 in Section 4.7, Hazards and Hazardous Materials for a description of the Plan).

APM BIO-14. Trash Cleanup: PG&E will properly contain and remove all trash and waste items generated by construction or crew activities.

APM BIO-15. Prohibitions for Pets, Fire, Firearms: PG&E will prohibit pets, campfires, and firearms from the Project site.

General Post-Construction

APM BIO-16. ROW Restoration: PG&E will restore work areas to pre-existing contours and conditions upon completion of work. Restoration, including revegetation and soil stabilization, will be performed as outlined in the Restoration and Monitoring Plan described below.

APM BIO-17. ROW Restoration Plan: PG&E will prepare a Restoration and Monitoring Plan to address post-construction revegetation, success criteria, and monitoring periods in natural areas. The intent of this plan will be to ensure that impacts are minimized and adequately mitigated to the satisfaction of the permitting agencies, property owners, and/or habitat managers. Restoration in agricultural fields and landscaped areas will be negotiated with the landowners and will result in restoration of temporarily disturbed areas to conditions similar to preconstruction conditions. The Restoration and Monitoring Plan to be developed by PG&E for review with resource agencies will include, at a minimum, the following measures:

- At the completion of construction activities, the ROW will be graded to restore flow lines and natural topography.

- Ripping or disking will be performed to relieve compaction at identified locations, if needed.

- Stockpiled topsoil will be re-spread, providing organic matter and a seedbank for restoration.
- At the completion of soil work, all areas disturbed by construction activities will be subject to implementation of permanent erosion control measures.
- Permanent erosion control measures could include spreading a combination of native grass and forb seed, fertilizer, compost, and mulch for soil protection.
- Two seed mixes will be identified, one for upland areas and one for drainages and wetland areas (vernal pools and vernal swales will be seeded separately).

APM BIO-18. Seed Mix and Success Criteria: In sensitive communities such as wetlands or stream crossings, PG&E's Restoration and Monitoring Plan will include the use of native seed or plantings and will specify native species lists and propagule types, quantities of material, and appropriate success criteria and monitoring requirements to be determined in discussion with the appropriate resource agencies with responsibility for those areas, e.g., USACE, CDFG, and/or CVRWQCB).

APM BIO-19. Erosion Control: PG&E will install and maintain appropriate temporary erosion and sediment control measures until revegetation is successful as defined by the success criteria to be outlined in the Restoration and Monitoring Plan. Erosion and sediment control measures would include the following: silt fence, fiber rolls, gravel bag berm, sand bag barrier, storm drain inlet protection, tracking controls, stockpile management, etc., as applicable; installation of additional run-off/run-on control measures during construction, as needed; and temporary or permanent soil stabilization measures on all disturbed areas where work is delayed or completed.

Creek Crossings and Wetland Habitats

APM BIO-20. Water Crossings in Special-status Species Habitats: PG&E will schedule water-crossing construction in waterways with suitable habitat for special-status aquatic species, including salmonids and other fish species, during dry months when the waterways have low or no flow in order to minimize potential impacts. This applies where traditional trenching methods will be used. Other waterways that have potential to support special-status fish species but that are likely to have flows during construction will be crossed using HDD methods.

APM BIO-21. Wetland and Waterway Avoidance During Final Design: PG&E will consider the locations of sensitive wetland habitats and waterways (including vernal pools) during final routing, and the pipeline will be routed to avoid these features wherever possible. Routing considerations will include trenchless construction technologies such as HDD, and narrowing of the ROW to the minimum needed for construction, where appropriate and feasible, to avoid impacts to sensitive wetland habitats and waterways.

APM BIO-22. Wetland Restoration and Monitoring Plan: Where wetland and/or vernal pool avoidance is not possible, PG&E will develop and implement a Wetland Restoration and Monitoring Plan that will describe construction restoration methods and compensatory mitigation. This plan will include discussion of a combination of on-site restoration and off-site compensation for any net permanent losses of vernal pools or wetlands based on mitigation ratios developed in coordination with the USACE and the USFWS. The plan will be submitted to the resource agencies, including the CDFG, USACE, CVRWQCB, and USFWS/NMFS as appropriate based on permitting requirements, for their review as part of the permitting processes for these areas. In addition to planting details such as the species to be planted and planting densities, the Wetland Restoration and Monitoring Plan will include information on performance criteria, monitoring, annual reporting, and remedial actions to be undertaken should monitoring determine that the success criteria have not been achieved.

APM BIO-23. HDD Fluid Release Contingency Plan: Prior to construction, PG&E will prepare an HDD Fluid Release Contingency Plan that will specify procedures to contain and clean up any drilling fluids released into waterways or wetlands in the event of an inadvertent release of drilling fluids during HDD procedures.

Vernal Pool Crustacean Habitat

APM BIO-24. Vernal Pool Invertebrate Mitigation: Section 7 consultation is anticipated to be required for the Project's effects on listed vernal pool invertebrate species. PG&E will minimize effects to these species by the general mitigation measures described above. Additional compensation for unavoidable direct effects to vernal pool invertebrate habitat will be based on the guidelines outlined in the USFWS Programmatic Formal Endangered Species Act Consultation on Issuance of 404 Permits for Projects with Relatively Small Effects on Listed Vernal Pool Crustaceans Within the Jurisdiction of the Sacramento Field Office, California (1996c), and will include:

- Preservation component. For every acre of habitat directly or indirectly affected, at least two vernal pool credits will be dedicated within a USFWS-approved ecosystem preservation bank, or, based on USFWS evaluation of site-specific conservation values, 3 acres of vernal pool habitat may be preserved on the Project site or on another non-bank site as approved by the USFWS.

- Creation component. For every acre of habitat directly affected, at least one vernal pool creation credit will be dedicated within a USFWS-approved habitat mitigation bank, or, based on USFWS evaluation of site-specific conservation values, 2 acres of vernal pool habitat will be created and monitored on the Project site or on another non-bank site as approved by the USFWS.

Giant Garter Snake

Because giant garter snake habitat is primarily aquatic, PG&E anticipates a Section 7 Consultation with the USFWS to take place as part of the USACE 404 permitting process. The following avoidance and mitigation measures are based on the Programmatic Biological Opinion for giant garter snake:

APM BIO-25. Giant Garter Snake Habitat Buffer: PG&E will avoid construction activities within 200 feet of the banks of suitable giant garter snake aquatic habitat where feasible.

APM BIO-26. Construction Window in Giant Garter Snake Habitat: With the exception of ROW isolation dike construction and irrigation flow culvert installation, PG&E will limit construction activity within giant garter snake habitat (predominantly in rice production areas of Line 407 East and Line 407 West Project segments within the Natomas Basins) to the period between May 1 and October 1. This is the active period for giant garter snake and direct mortality is lessened because snakes are expected to actively move and avoid danger. For work that occurs between October 2 and April 30, PG&E will contact the USFWS and CDFG to determine if additional measures are necessary to minimize and avoid take.

APM BIO-27. Giant Garter Snake Monitoring: PG&E will retain a qualified biologist to survey for giant garter snake immediately prior to construction activities that take place in or within 200 feet of giant garter snake habitat. Survey of the Project area will be repeated if a lapse in construction activity of two weeks or more has occurred. If a snake is encountered during construction, activities will cease until the snake leaves or is removed by a permitted biologist in accordance with the Biological Opinion to be issued by the USFWS for the Project.

APM BIO-28. Dewatering Giant Garter Snake Habitat: To protect giant garter snake, for any dewatering of potential giant garter snake habitat that occurs after April 15, PG&E will keep the dewatered habitat dry for at least 15 consecutive days prior to excavating or filling the dewatered habitat. This may be required at smaller canal crossings within the Line 407 East and Line 407 West area in rice production areas within the Natomas Basin. Where habitat cannot be dried, a biological monitor will survey the area for giant garter snake immediately prior to and during all construction activities until construction is complete in the area.

Special-Status and Nesting Birds

APM BIO-29. Bird Nest Surveys and Monitoring: Because construction will take place during the breeding and nesting season of avian species in the Project area (typically February 1 through August 31), PG&E will conduct nesting bird surveys prior to construction for avian species with potential to occur on-site, or where accessible, in areas adjacent to construction. Where nesting migratory birds are found in or near the Project area, these factors will be evaluated by a qualified biologist, and where nest disturbance may occur, the biologist will ensure adequate mitigation measures are implemented.

APM BIO-30. Nesting Birds: In accordance with the MBTA, if an active nest is observed in the Project area during construction, PG&E will stop work within the appropriate buffer for the species and contact the biological monitor immediately. Nest disturbance is dependant on a number of site-specific and activity-specific factors, including the sensitivity of the species, proximity to work activity, amount of noise or frequency of the work activity, and intervening topography, vegetation, structures, etc. Additional mitigation may be required to minimize disturbance of detected nesting activity, such as allowing nesting activity to conclude before continuing construction in an area, restricting certain types of construction practices/activities, creating screening devices to shield nest sites from construction activity, and establishing buffer areas around active nest sites. For inactive nests, measures could include removal and/or handling of nest materials, which will be conducted under the supervision of a qualified biologist.

Burrowing Owls

APM BIO-31. Burrowing Owl Surveys: PG&E will retain a qualified biologist to conduct burrowing owl surveys and to identify any occupied burrows in all Project sites and buffer zones with suitable habitat along the Line 406 and Line 407 West segments of the proposed Project. These surveys will be conducted not more than 30 days prior to initial ground-disturbing activities.

APM BIO-32. Burrow Avoidance: If occupied burrows are identified during surveys, PG&E will maintain a buffer of approximately 160 feet from occupied burrows during the nonbreeding season of September 1 through January 31, and approximately 250 feet during the breeding season of February 1 through August 31. Occupied burrows will not be disturbed within these buffers during the nesting season, from February 1 through August 31, unless a qualified biologist has verified that the birds have not begun egg-laying and incubation or that the juveniles from those burrows are foraging independently and capable of independent survival at an earlier date. Avoidance also requires that a minimum of 6.5 acres of foraging habitat be preserved contiguous with occupied burrow sites for each pair of breeding burrowing owls (with or without dependent young) or a single unpaired resident bird; given the large amount of adjacent habitat in the Dunnigan Hills area, this measure is considered to be met throughout the Project area.

APM BIO-33. Burrow Relocation: If avoidance of occupied burrows is not possible during construction, PG&E will retain a qualified biologist to supervise and/or conduct passive relocation of burrows. Passive relocation is defined as encouraging owls to move from occupied burrows to alternate natural or artificial burrows that are beyond approximately 160 feet from the impact zone and that are within or contiguous to a minimum of 6.5 acres of foraging habitat for each pair of relocated owls. Relocation of owls will only be implemented during the non-breeding season. If relocation is necessary, the biologist will conduct the following measures:

- Owls will be excluded from burrows in the immediate impact zone and within an approximately 160-foot buffer zone by installing one-way doors in burrow entrances.

- One-way doors will be left in place 48 hours to ensure owls have left the burrow before excavation.

- One alternate natural or artificial burrow will be provided for each burrow that will be excavated in the Project impact zone.

- The Project area will be monitored daily for one week to confirm owl use of alternate burrows before excavating burrows in the immediate impact zone.

- Whenever possible, burrows will be excavated using hand tools and refilled to prevent reoccupation; sections of flexible plastic pipe or burlap bags will be inserted into the tunnels during excavation to maintain an escape route for any animals inside the burrow.

APM BIO-34. Burrowing Owl Monitoring Plan: If relocation of burrows is required, PG&E will prepare a Burrowing Owl Monitoring Plan, which will include mitigation success criteria and a timeline for submittal of annual reports to the CDFG. Annual reports will describe the number and locations of relocations, relocation procedures used, and the degree of success.

Compensatory Mitigation

APM BIO-35. Species-specific and Habitat-specific Compensation: PG&E will provide compensatory mitigation for impacts to vernal pools, wetlands, giant garter snake, and other special-status species as agreed upon through consultation with the USFWS, USACE, and/or CDFG. Proposed measures and compensation ratios have been outlined in the above sections by species. Total acreages of impact to special-status species and sensitive habitats will be calculated upon determination of a final route by the CEQA Lead Agency (California State Lands Commission), and final compensatory mitigation ratios will be determined in consultation with the appropriate resource agencies during permitting of the Project. Compensatory mitigation will likely consist of a combination of restoration of habitat on-site, and creation and/or preservation of the appropriate habitat at a suitable location in the Project vicinity, or at a suitable agency-approved mitigation bank. Mitigation banks in the immediate project vicinity include the Natomas Basin Conservancy and the Sacramento River Ranch Conservation Bank. Other mitigation banks in the area include Laguna Terrace East, Bryte Ranch, and Clay Station. Both Wildlands and Westervelt

Ecological Services manage additional mitigation banks in the Project area.

4.4.5 Impact Analysis and Mitigation

Impact Discussion

Wetland Water Quality

Installation of the Project has the potential to impact the water quality in wetlands, as well as in streams that lead to wetlands, including the Sacramento River, Knights Landing Ridge Cut, Curry Creek, Steelhead Creek, Yolo Bypass, Tule Canal and Goodnow Slough; most which are adjacent to other sensitive wetland habitats. In APM HWQ-4, APM BIO-20, and APM BIO-21, the Project proposes that the crossing of major waterways and floodplain areas along the proposed alignment would be conducted using HDD methodologies. Entrance and exit locations would be set back from streams and channels. As proposed in APM HWQ-5, APM BIO-23, and MM HWQ-1, the Project would implement a HDD Fluid Release Contingency Plan that would require that any drilling fluids inadvertently released into waterways or wetlands during HDD procedures would be cleaned up.

Open-cut trenching is proposed during the dry months within small irrigation/drainage canals, seasonal wetlands, riparian wetlands, and other smaller wetland features. Restoration of disturbed wetland habitats is discussed below under Impact BIO-2. Regarding potential water quality impacts to these and adjacent wetland features, trenching activities would have the potential to impair water quality if the areas disturbed during construction are not re-contoured and restored before the wet season. Because open-cut trenching would be temporary and would be restricted to the summer dry months, no sedimentation or erosion into active waterways are anticipated. Open trenches would be backfilled, re-contoured, and compacted immediately following excavation and installation of pipeline sections. Restoration of affected areas would occur during the same dry season, thereby preventing the exposure of unsettled substrate to streamflow within the affected areas during the wet season (see Impact BIO-2).

Regardless, soil erosion directly into wetlands and other water features during trenching activities has the potential to decrease wetland water quality. As discussed in Section 4.8 under Impact HWQ-1, implementation of APM BIO-35 would ensure that PG&E acquires all necessary permits from the USACE, the CVRWQCB, and the CDFG for potential stream channel impacts. There may be some additional avoidance or mitigation measures that are required by the CVRWQCB or the CDFG during the permitting process with regard to water quality criteria, standards, or objectives that would be implemented.

Implementation of APM HWQ-1, APM HWQ-2, and APM BIO-7 would ensure that the Project adheres to BMPs during the construction phase to avoid or minimize potential adverse impacts to water quality. Implementation of the PG&E Water Quality Construction Best Management Practices Manual and the Erosion Control and Sediment Transport Plan would ensure the avoidance or minimization of potential impacts to water quality from erosion and sedimentation. APM BIO-6 requires that a qualified biologist be on-site to monitor compliance with mitigation measures. APM BIO-21 states that PG&E will consider locations of sensitive wetland habitats and waterways during final routing such that additional wetland features may be avoided (rather than trenched through) during Project construction;

Therefore, the Project as designed would not result in short- or long-term violations of Federal or State water quality standards in streams. Potential impacts would be less than significant (Class III).

Spill or Leak / Health Hazard

The Project has the potential to result in a spill or leak of fuels, lubricants, or other fluids from use of vehicles and other equipment near or in a water feature; from leaking or other damage to containers used to store hazardous materials on site; or from inadvertent release of drilling fluids when HDD methods are deployed. The use of HDD methods to install pipeline beneath sensitive habitats and waterways, such as the Sacramento River, has the potential to release non-toxic substances that could adversely impact aquatic species. APM BIO-23 requires PG&E to prepare an HDD Fluid Release Contingency Plan, which is described in Section 2.0, Project Description, Contingency Planning.

To prevent equipment leakage into sensitive habitats, PG&E would implement APM BIO-5, which confines all heavy equipment, vehicles, and construction work to approved areas only and restricts equipment, where possible, from entering watercourses with the potential to support special-status species. Where avoidance of such watercourses is not possible, implementation of APM BIO-35 would ensure that PG&E acquires all necessary permits and adheres to mitigation measures required from the USACE, the CVRWQCB, and the. In addition, implementation of APM BIO-13 requires PG&E to prepare and implement a Hazardous Substance

Control and Emergency Response Plan (see APM HAZ-2 in Section 4.7, Hazards and Hazardous Materials, for a description of the plan). Measures outlined in this plan would include maintenance of construction equipment to prevent leaks of fuels, lubricants, or other fluids into waterways and other sensitive habitats and restriction of refueling activities to areas at least 100 feet from waterways or wetland boundaries, among others.

Similarly, due to implementation of the APMs discussed above, the Project would not create a potential health hazard or involve the use, production, or disposal of materials in a manner that would be expected to pose a hazard to wildlife or fish populations in the project area. Implementation of APM BIO-7 includes construction avoidance and minimization measures to ensure that erosion, sediment, and material stockpile BMPs are implemented to minimize the potential for fill and construction runoff into affected waterways and adjacent wetlands potentially supporting wildlife and fish populations. APM BIO-14 includes measures for trash cleanup to ensure that all trash and waste items generated by construction and crew activities are properly contained.

The Project, as planned, would not result in a spill or leak that would contaminate the soil to the extent of eradicating the existing vegetation or that would migrate to other areas. Potential impacts would be less than significant (Class III). The proposed Project also incorporates avoidance and minimization measures during the construction phase that would reduce potential impacts associated with potential health hazards or the use, production, or disposal of materials that could be hazardous to wildlife and fish populations to less than significant.

Deterioration of Existing Habitat for Special-status Fish Species

All waterways that support the required habitat elements for the movement, range, or spawning of special-status resident or anadromous fish would be crossed using HDD methodologies. For the proposed Project, such waterways consist of the Sacramento River, Steelhead Creek, Tule Canal, and the Yolo Bypass. HDD entrance and exit points would be set back from aquatic, riparian, and wetland habitat that could contribute to the movement, range, or spawning of any resident or anadromous fish. In the unlikely event of the release of drilling fluids during HDD procedures, the Project could result in potential impacts to the movement, range, or spawning of resident or anadromous relating to the temporary impairment of water quality and degradation of aquatic habitat. Potential impacts resulting from a frac-out during HDD procedures would be reduced to less than significant levels with the implementation of a HDD Fluid Release Contingency Plan, as proposed in APM BIO-23.

The implementation of open-cut trenching methodologies would be limited to waterways that do not have the potential to support suitable spawning, rearing, or foraging habitat, or suitable water quantities and connectivity to support the movement, range, or spawning of any resident or anadromous fish. Any potential impacts resulting from open-cut trenching in the vicinity of waterways supporting special-status resident or anadromous fish would be avoided by implementation of APM BIO-20, which restricts construction activities to dry months when migratory, ranging, and spawning activities for resident or anadromous fish do not typically occur, or are unable to occur, due to limited or restricted access and unsuitable conditions. Therefore, no impacts to the movement, range, or spawning of any resident or anadromous fish are anticipated to result from the open-cut trenching of waterways.

Implementation of APM BIO-3, APM BIO-5, APM BIO-7, APM BIO-12, APM BIO-13, APM BIO-16, APM BIO-17, and APM BIO-22 would further reduce potential impacts to the movement, range, or spawning of any resident or anadromous fish. Potential impacts would be less than significant (Class III).

Critical Habitat

The Project would not result in the loss or alteration of existing or proposed critical habitat for one or more listed species. The Project site does not contain designated critical habitat for any listed plant or wildlife species.

Critical habitat for the Central Valley steelhead has been designated in the Sacramento River, Yolo Bypass, and within lower Steelhead Creek approximately 6 miles south of the section to be crossed by the proposed Project. Additionally, critical habitat for winter-run chinook salmon has been designated in the Sacramento River from the San Francisco Bay upstream to Keswick Dam near Redding, California. Primary constituent elements have been developed for salmonids (salmon and steelhead) that define the physical or biological features that are essential to one or more life stages of a species. Generally, these include freshwater spawning sites, freshwater rearing sites, freshwater migration corridors, estuarine areas, nearshore marine areas, and offshore marine areas.

The primary constituent elements for salmonid habitat that are relevant to the proposed Project would include: spawning sites with adequate water quantity and quality and suitable substrate; rearing sites with adequate water quantity and floodplain connectivity to support and maintain juvenile development, including natural cover (shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rock and boulders, or side channels); and undercut banks to support juvenile mobility and survival. Also required are freshwater migration corridors free of obstruction with adequate water quantity, quality conditions, and natural cover (NMFS 2005, NMFS 2008a, NMFS 2008b).

Although not designated as existing or proposed critical habitat, EFH for Central Valley fall- and late-fall-run chinook salmon, winter-run chinook salmon, and spring-run chinook salmon occurs within the Sacramento River, and within the Tule Canal and Yolo Bypass during the wet months when these areas support adequate water quantities and water quality. Chinook salmon EFH includes all those streams, lakes, ponds, wetlands, and other waterbodies currently or historically accessible to salmon. It also includes aquatic areas above all artificial barriers except specifically cited impassible dams. Excluded are areas upstream of longstanding naturally impassible barriers (i.e., natural waterfalls in existence for several hundred years). Freshwater EFH for chinook salmon consists of spawning and incubation habitat, juvenile rearing habitat, juvenile migration corridors, and adult migration corridors. Physical components of freshwater EFH include suitable substrate composition, water quality, water quantity, depth and velocity, channel gradient and stability, food, cover and habitat complexity, space, access and passage, and floodplain habitat connectivity (TRC 2007, NMFS 2008c).

As described above, the crossing of all features designated as critical habitat and/or supporting EFH would incorporate HDD procedures, per APM BIO-20. HDD procedures would include directional drilling beneath the Sacramento River, Steelhead Creek, and Tule Canal within the Yolo Bypass, thereby avoiding any direct impacts and disturbance to primary constituent elements of any special-status species' critical habitat within these features. HDD entrance and exit points would be setback within upland areas from all potential fish habitat associated with these waterways. APM BIO-21 ensures that adjacent wetland and riparian habitats will be avoided wherever possible during construction and, when disturbed, APM BIO-22 ensures that these areas will be restored to pre-construction conditions. As proposed in APM BIO-23, potential indirect impacts to critical habitat resulting from an unlikely frac-out during HDD procedures would be reduced to less than significant levels with the implementation of a HDD Fluid Release Contingency Plan.

Potential impacts to critical habitat for listed fish species would therefore be less than significant (Class III).

Interference with the Movement or Range of Wildlife Species

Wildlife habitat removal would result from construction and ongoing operation and maintenance activities, including: (1) ground surface blading, grading, and subsurface trenching, (2) tree or shrub removal and tree trimming/crushing, (3) storage of trench spoils, or (4) pipeline stringing and installation. Each of these activities could effectively remove existing habitat, thereby reducing its availability to local wildlife populations. In some areas, construction access would require construction of new roads or upgrading of existing roads. Grading previously undisturbed surfaces to access the ROW could remove rocks, shrubs and other objects from the soil surface, leaving a relatively clear pathway for construction vehicles.

Temporary loss of habitat within the ROW could affect some small mammal, reptile and/or amphibian species with very limited home ranges and mobility. For these species, the clearing for the pipeline right-of-way and access roads could represent a slight reduction in the carrying capacity of a portion of their home range until a productive vegetation cover is re-established. However, most of these species are common and widely distributed throughout the area and the loss of a few individuals as a result of habitat removal would have a negligible impact on overall populations of the species, either locally or throughout the region.

Temporary removal of wildlife habitat along the length of the pipeline right-of-way would result in loss of wildlife habitat, and is therefore considered a potentially significant impact. This temporarily affected habitat, however, will be restored to pre-existing conditions (pre-existing topography and vegetation community) immediately following construction (*MM BIO-1 and MM BIO-2*). Implementation of APM BIO-1, APM BIO-2, APM BIO-4, APM BIO-5, APM BIO-6, APM BIO-15, APM BIO-16, APM BIO-17, APM BIO-20, APM BIO-21, APM BIO-22, and APM BIO-35 would reduce impacts to wildlife movement to less than significant. Potential impacts to special-status wildlife species are discussed below under Impact BIO-4.

Candidate or Sensitive Species Populations

The Project would not result in direct or indirect impacts on candidate or sensitive plant or fish species populations, or their habitat, that would contribute to or result in the Federal or State listing of the species (e.g., substantially reducing species numbers or resulting in the permanent loss of habitat essential for the continued existence of a species).

Plant Species

Sensitive plant species would not be impacted by the Project. Protocol-level surveys identified populations of only one special-status plant species, dwarf downingia, within the Project study area. These populations are located outside of the Project site, south of Riego Road east of Pleasant Valley Road. At this location, installation of the Project would occur on the north side of Riego Road, thereby avoiding impacts to these populations. APM BIO-3 requires PG&E to mark the boundaries of sensitive habitat features that are to be avoided, and APM BIO-4 restricts vegetation removal only to the approved work area, Implementation of these measures would ensure that these populations are not directly impacted by workers or by equipment during construction.

Fish Species

The following candidate or sensitive fish species that are not listed as threatened or endangered have a potential to occur within the Sacramento River during all or portions of the year and within the Yolo Bypass (including the Tule Canal) and Steelhead Creek during wet months: Central Valley fall- and late-fall run chinook salmon, river lamprey, and Sacramento splittail. As discussed above, implementation of APM BIO-20, APM BIO-21, APM BIO-22, and APM BIO-23 would reduce impacts to sensitive fish species to less than significant (Class III).

Impact BIO-1: Wetlands

The Project would fill or alter a wetland or vernal pool, resulting in a long-term change in its hydrology or soils, or the composition of vegetation of a unique, rare, or special concern wetland community (Potentially Significant, Class II).

Table 4.4-2 contains a conservative estimate of the acreage of federally jurisdictional wetlands and other waters of the U.S. that occur within the Project site. The Project site was defined as the area that may be disturbed during construction, including a maximum 100-foot right-of-way, pipe storage yards, staging and laydown areas, and permanent aboveground facilities. Of the 796.97 acres of federally jurisdictional wetlands and other waters of the U.S. that occur within the Project study area, up to 65.95 acres (2.17 acres of other waters of the U.S., and 63.55 acres of wetlands) would potentially be disturbed due to construction of the proposed Project.

Specifically, up to 0.04 acre of NRPW, 1.55 acres of RPW, 0.58 acre of TNW (Sacramento River), 0.1 acre of fresh emergent wetland, 0.79 acre of riparian wetland, 0.71 acre of seasonal swale, 6.52 acres of seasonal wetland, 0.1 acre of vernal pool, 0.04 acre of willow riparian, and 55.28 acres of rice would be disturbed.

Of the non-federally jurisdictional water features in the Project study area, approximately 3.07 acres may be subject to CDFG jurisdiction. These features include five irrigation canals (Hungry Hollow Canal, Acacia Canal, and three unnamed irrigation canals), and one agricultural drainage ditch along Line 406. The proposed project has the potential to affect portions of these features.

Appendix E-1 contains the jurisdictional delineation reports prepared for the proposed Project. The majority of the jurisdictional wetlands and water features are located along Line 407. In addition, the easternmost portion of the Project crosses vernal pools that are within the Beale and Western Placer County core areas of the Southeastern Sacramento Valley vernal pool region, as identified in the Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon (USFWS 2005). The Project has the potential to directly and indirectly affect these vernal pools, vernal swales, and vernal pool/vernal swale complexes through alteration of surface hydrology or subsurface hydrology through disruption of impermeable soil layers.

Of the locations proposed for constructing the six aboveground facilities, two (the Powerline Road Main Line Valve and the Powerline Road Pressure Regulating Station) contain wetlands or water features (see Table 4.4-1). Construction of these aboveground stations would result in the permanent conversion of 0.62 acre of jurisdictional rice field.

Table 2-5 in Section 2.0, Project Description, indicates that PG&E proposes to avoid several vernal pools and vernal pool complexes using HDD methodology; however, several vernal pools and swales and numerous seasonal wetlands, riparian wetlands, and other jurisdictional water features would be disturbed by trenching during project construction. The Project therefore has the potential to directly and indirectly impact vernal pools, vernal swales, and vernal pool/vernal swale complexes through alteration of surface hydrology, or subsurface hydrology through disruption of impermeable soil layers.

Vernal pools in this region are classified primarily as Northern Hardpan. Northern Hardpan vernal pools are formed on impermeable surfaces created by an accumulation of clay particles. Long-term hydrologic change to vernal pools and other wetlands could result from trenching activities. Temporary impacts to adjacent wetlands and waters of the U.S. could be caused by the interception and detention of groundwater or surface water within excavated trenches, reducing the hydrologic input to adjacent wetlands. Backfill material and methods would affect wetland hydrology by altering surface and subsurface flow. For example, the pipeline backfill materials (such as gravel or coarse-textured non-native fill) could be more or less permeable than native materials. Surface alteration would impede or accelerate drainage. Compaction and settlement of backfill would create ditches along the pipeline. Excess backfill may restrict surface or groundwater connections to wetlands. Impacts to the hydrologic function of wetlands would be considered potentially significant (Class II).

Impacts to wetlands that are habitat for special-status plant species would cause an impact to the species occupying those habitats. Impacts to these special-status plant species and wetlands/riparian forests would be considered potentially significant. However, protocol-level surveys of the Project study area indicate that no special-status plant species occur within the Project site and, therefore, no impacts to special-status wetland-dependent plants are anticipated to occur under the proposed Project.

There are several APMs incorporated into the Project design that reduce potential direct impacts to federal and State jurisdictional wetlands and water, including APM BIO-1, APM BIO-2, APM BIO-3, APM BIO-5, APM BIO-7, APM BIO-12; APM BIO-13, APM BIO-14, APM BIO-16, APM BIO-17, APM BIO-18, APM BIO-19, APM BIO-20, APM BIO-21, APM BIO-22, APM BIO-23, APM BIO-24, and APM BIO-35, APM BIO-21 states that PG&E will consider the locations of sensitive wetland habitats and waterways during final routing and, where possible, the pipeline would be routed to avoid these features. APM BIO-22 stipulates that where wetland and/or vernal pool avoidance is not possible, PG&E will develop and implement a Wetland Restoration and Monitoring Plan that would describe restoration methods and compensatory mitigation. For vernal pool habitat suitable for special-status crustaceans, APM BIO-24 requires that direct, unavoidable impacts be mitigated through preservation and creation of additional habitat at an approved mitigation bank. While implementation of the APMs listed above is required to reduce impacts to wetlands and waters, additional mitigation is necessary to reduce impacts to less than significant.

Implementation of MM BIO-1a, MM BIO-1b, and MM BIO-1c is intended to reduce impacts to federally and State-jurisdictional wetlands and water features to less than significant.

Mitigation Measures for Impact BIO-1: Wetlands

MM BIO-1a. **Wetland Avoidance and Restoration.** PG&E shall avoid, minimize, and/or compensate for damage and/or loss of wetland vegetation types due to pipeline construction activities by completing the following:

- Maximum avoidance of jurisdictional wetlands by fencing wetlands and appropriate buffer zones.
- Restricted vegetation removal and topsoil storage and replacement.
- Consultation with the USACE and RWQCB for any unavoidable wetland impacts.
- Preparation and implementation of wetlands restoration for any unavoidable impacts to wetlands.
- Supervision and verification of the implementation of these measures by the Environmental Monitor (see APM BIO-6).

Avoidance will consist of fencing the wetlands within the ROW, including appropriate buffer zones, to minimize impacts to wetland vegetation types. If construction work areas and/or associated overland travel in wetlands is unavoidable, all equipment, vehicles and associated construction materials shall be placed on protective mats to avoid soil compaction, such that they do not make direct contact with the wetland. Vegetation clearing and/or installation of mats shall be conducted only from areas scheduled for immediate construction work (within 10 days) and only for the width needed for active construction activities. Mats shall be removed immediately following completion of activities within each active construction area. During pipeline construction, the 12 inches of topsoil shall be salvaged, stored in an upland location, and replaced wherever the pipeline is trenched in wetlands. Prior to permit issuance and final design, project construction plans shall depict appropriate measures for topsoil protection and storage that will allow survival of native seed within the topsoil. Topsoil shall be placed at the surface on top of fill material and not be used to backfill the trench, and excavated trench spoils or excess fill shall be placed on top of the pipeline under topsoil and not dispersed onto the surface of the ROW. Implementation of these measures prior to and during construction will be supervised and verified by the Environmental Monitor (see APM BIO-6).

Unavoidable direct impacts to wetland vegetation types during construction and/or associated overland travel will require consultation with the appropriate jurisdiction (USACE, RWQCB, CDFG) and will likely require a permit. These impacts shall be mitigated by restoration of the affected area to pre-construction conditions in accordance with permits issued by the USACE, RWQCB, and CDFG. Consistent with requirements set forth in permits issued by the USACE, RWQCB, and CDFG for work in wetlands and waters, and with other plans developed for the pipeline construction project, including (but not limited to) the Restoration and Monitoring Plan (see APM BIO-17), the following procedures shall be implemented:

- A delineation of potentially affected wetlands for any areas not included in the jurisdictional delineation performed by CH2MHill (2008) and Galloway (2007a; 2008a; 2008b).

- A discussion demonstrating how maximum avoidance has been accomplished and why the wetlands proposed to be impacted cannot be avoided.

- Methods proposed for restoring the affected wetlands, including topsoil preservation (inclusive of restoration of an impermeable layer, i.e., hardpan, if approved) and backfilling, soil and grade preparation such that there is no change in pre-construction contours, regionally native seed and/or plant materials to be used and installation methods, and maintenance measures, including weed control.

- Minimum 1:1 replacement ratio (in-land, on-site) for area and function of temporarily damaged wetland areas.

- A minimum five-year monitoring program with detailed success criteria regarding species cover, species composition, species diversity, wetland area and depth as compared with pre-construction conditions documented prior to construction by a qualified biologist such that the function of the affected wetland and hydrology is fully restored, the methods and results of which shall be described in the Plan.

- Annual monitoring over a minimum five-year period to evaluate whether the pipeline installation is substantially altering surface or subsurface flow of water as determined through (1) topographic assessments of the pipeline sites and (2) assessments of vegetation and hydrology conditions within adjacent wetlands (as compared to pre-construction conditions).

- Methods for correcting observed alterations to surface or subsurface flows.

- Annual reporting requirements to responsible agencies.

- Detailed contingency measures in case of restoration failure, as determined by the responsible agencies following the five-year monitoring period, requiring additional off-site wetland creation at a minimum ratio of 2:1 for created wetland acreage.

MM BIO-1b. **Trench Backfill and Topographic Restoration.** The purpose of this measure is to prevent temporary and permanent hydrologic alteration to wetlands and associated sensitive vegetation from backfill activities associated with pipeline installation by requiring:

- Appropriately-timed work so that trenches are not excavated or backfilled during the wet season.

- Preparation and implementation of soil and grade restoration measures including backfill and compaction methods and an annual monitoring program.

- Supervision and verification of the implementation of these measures by the Environmental Monitor.

Prior to construction, responsible agencies (including the RWQCB, CDFG, USACE, and County agencies) shall evaluate soil and grade restoration measures to be implemented along the ROW. Restoration of wetlands directly impacted by pipeline construction is addressed in MM BIO-1a. To prevent hydrologic impacts to wetlands and associated vegetation resulting from pipeline backfill activities the following procedures shall, at a minimum, be addressed in accordance with any permit conditions issued by responsible agencies:

- Excavation, soil storage and backfill methods to ensure that topsoil returned to the surface and is not be used to backfill the trench, and subsoil is not be dispersed onto the surface.
- Requirements for the separation of topsoil and subsoil in upland storage locations.
- Methods to ensure native seed survival within stored topsoil.
- Circumstances requiring use of imported soils, proposed source of soil.
- Backfill compaction specifications to ensure that changes in infiltration and lateral flow do not substantially alter subsurface hydrology.
- Specifications for the restoration of pre-construction surface topography to ensure that mounds or berms, due to overfill, or trenches, due to soil settling, are not created that will substantially alter surface hydrology.

Implementation of these measures during and after construction shall be supervised by the Environmental Monitor.

MM BIO-1c. **Riparian Avoidance and Restoration.** PG&E shall avoid, minimize, and compensate for impacts to riparian habitat during construction due to trenching, open cut crossings of streams, and pit excavation for bore crossings of streams by:

- Identification and avoidance of riparian forest by boring under streams where feasible.
- Consultation with CDFG for any unavoidable impacts to riparian vegetation.
- Fencing riparian vegetation adjacent to work areas to prevent impacts.
- Preparation and implementation of riparian restoration, including replanting and monitoring elements.
- Supervision and verification of implementation of these measures by the Environmental Monitor.

Riparian habitat within the ROW shall be identified by a qualified ecologist, mapped on construction plans, and fenced prior to construction. These areas should be avoided to the maximum extent feasible. If riparian habitat cannot be avoided by boring under the stream, the following impact minimization measures, at a minimum, shall be implemented during construction in accordance with any permit conditions imposed by responsible agencies:

- The work area shall be limited to the minimum necessary and shall be fenced prior to construction.
- Vegetation within the work area shall be cleared in a manner that does not damage the root system of adjacent remaining vegetation.
- The upper 12 inches of topsoil shall be salvaged, stored at an upland location, and returned to the surface after trench backfilling is complete.
- Existing vegetation shall be cleared only from areas scheduled for immediate construction work (within 10 days).

The Environmental Monitor shall supervise compliance with these protective measures prior to and during construction activities.

Unavoidable direct impacts to riparian vegetation during construction will require consultation with the appropriate jurisdiction (CDFG) and will likely require a permit (portions of riparian habitat, specifically riparian wetland and willow riparian, are federally jurisdictional wetlands and impacts to these areas would need to be addressed in consultation with USACE). These impacts shall be mitigated by restoration of the affected area to pre-construction conditions in accordance with permits issued by CDFG. A qualified ecologist shall dictate the following procedures to ensure that they will be consistent with applicable local jurisdiction requirements, such as County Tree Ordinances, and with any additional permit conditions imposed by the local agency as well as CDFG and other agencies. If a tree within the riparian forest to be removed qualifies as a Protected Tree under the local jurisdiction, MM BIO-2a and 2b shall be applied and any mitigation standards shall default to the one requiring the higher standard. Riparian habitat removal shall not be permitted until the following procedures are documented:

- Identification of proposed riparian habitat removal (and subsequent restoration) locations from CH2MHill and Galloway Consulting, Inc. Jurisdictional Delineation Reports (see Appendix E-1).

- A discussion demonstrating how maximum avoidance has been accomplished and why the riparian habitat proposed for removal cannot be avoided.

- Methods to restore streambanks to pre-construction conditions.

- Discussion of appropriate replacement ratios (in accordance with issued permit conditions, or, at a minimum, a 1:1 replacement ratio of habitat acreage and at least 3:1 replacement ratio of the number of trees and shrubs present prior to construction).

- Proposed native tree and shrub species matching pre-construction conditions.

- Proposed understory native seed mix composition and application methods.
- Planting methodology, including spacing and proper timing of plant installation.
- Description of protective staking and caging measures for installed plants.
- Description of irrigation and plant maintenance regime.
- Description of five-year monitoring effort to measure replacement success.
- Success criteria (including survival rates and habitat function as compared to pre-construction conditions) and contingency measures for off-site habitat creation in case of mitigation failure.
- Submission of an annual monitoring report to responsible agencies evaluating mitigation success.

Successful implementation of the riparian restoration procedures shall be evaluated five years after all human support (e.g., replanting, fertilization, irrigation) has ceased. At that time, a report shall be submitted to the responsible agencies summarizing the results and a determination will be made by these agencies as to whether continued monitoring is required and/or whether implementation of contingency measures is required.

Rationale for Mitigation

Implementation of BIO-1a, BIO-1b, and BIO1-c would ensure that impacts to federally and State-jurisdictional wetlands and other waters of the U.S. are minimized to the greatest extent feasible and that following construction of the proposed Project, backfilling and restoration activities properly ensure that wetland functionality is restored to disturbed features.

Impact BIO-2: Reduce or Alter Vegetation

The Project would result in the long-term (more than 5 years) reduction or alteration of unique, rare, or special concern vegetation types, riparian vegetation, or natural communities (Potentially Significant, Class II).

Temporary impacts to upland vegetation communities such as annual grassland / ruderal (134.16 acres), riparian woodland (1.04 acres), valley oak woodland (0.59 acre), orchard (22.75 acres), irrigated row and field crops (238.86 acres), and developed/disturbed areas (118.05 acres) would occur due to vegetation removal within the 100-foot right-of-way during grading, trenching, pit excavation, and staging. This temporary impact to annual grasslands, irrigated row and field crops, and developed/disturbed areas would be considered less than significant based on the abundance of these vegetation communities in the Project study area. However, impacts to treed habitats such as riparian woodland, valley oak woodland, and orchard are potentially significant (Class II).

Based on conservative estimates made using recent aerial photography (NAIP 2005), approximately 206 trees occur within the Project site and would be removed to accommodate project construction within the temporary and permanent rights-of-way. An additional 1,967 trees occur within 250 feet of the Project site, some of which may require removal or pruning/trimming in order to construct the Project. None of these trees are designated as Heritage or Landmark trees (Sacramento County Code Chapter 19.12 (Kent Reeves, Principal Natural Resources Planner, personal communication; Breann Sober, Planner, personal communication). However, these trees would be directly and/or indirectly impacted by Project construction. Direct and indirect impacts to native oak trees within the Project site would conflict with both state and county protection ordinances. In addition, the Project passes through a small, mature valley oak woodland. This is a rare habitat type and is suitable for nesting by a variety of raptor species, including Swainson's hawk; direct and indirect impacts to this habitat type are considered potentially significant (Class II).

Construction of the six aboveground facilities would permanently convert 1.19 acres of annual grassland/ruderal, 0.36 acre of irrigated row and field crop, 0.62 acre of rice, and 0.01 acre of developed/disturbed area. Impacts to the 0.62 acre of rice field were addressed above under Impact BIO-1 and implementation of MM BIO-1a, MM BIO-1-b, and MM BIO-1c is required to reduce impacts to rice habitat to less than significant. Because the remaining area permanently impacted at the proposed valve locations is small and occurs in predominantly developed or disturbed areas, these permanent impacts to annual grassland/ruderal, irrigated row and field crop, and developed/disturbed areas is considered less than significant.

APM BIO-4 limits the area within which vegetation can be removed during construction, and APM BIO-17 requires PG&E to prepare a Restoration and Monitoring Plan to address post-construction vegetation. While these APMs reduce impacts to treed habitats, additional mitigation measures are necessary to reduce impacts to less than significant. Implementation of MM BIO-1a, 1b, and 1c would assist in the protection and restoration of riparian treed habitats. However, implementation of MM BIO-2a and MM BIO-2b would be required to reduce impacts to these vegetation communities to less than significant.

Mitigation Measures for Impact BIO-2: Reduce or Alter Vegetation

MM BIO-2a. **Tree Avoidance and Replacement.** PG&E shall avoid, minimize, and compensate for impacts to trees, including those protected by local ordinances, by:

- Pre-construction identification, fencing and avoidance of trees to the maximum extent during construction.
- Consultation with local jurisdiction if unavoidable impacts to locally protected trees ("Protected Trees") are likely to occur.
- Development and implementation of a Tree Replacement Plan for loss and/or significant damage to trees.
- Supervision and verification of the implementation of these measures by the Environmental Monitor.

The initial step for this measure shall be to determine the size and location of all trees located within and adjacent to the project right-of-way, work areas, staging areas, and launcher/receiver stations. These trees will be then assessed by a qualified arborist to identify and map Protected Trees. If it is determined that the project will trim, remove, or damage the roots of Protected Trees, avoidance measures shall be taken. Avoidance will consist of installing protective fencing around the dripline of any Protected Tree. All construction activities, including excavation, grading, leveling, and disposal or deposition of harmful materials will be prohibited inside the dripline fence. Attachment of wires, ropes, or signs to Protected Trees shall also be prohibited. The approved Environmental Monitor shall supervise compliance with these protective measures prior to and during construction activities.

If trimming, removal or root damage to a Protected Tree is unavoidable, the appropriate jurisdiction will be consulted. Further actions may require a permit that will include fees and/or replacement for affected trees. For example, Placer County's permit application requires, in part, a site plan map, an arborist report, and a justification statement. Mitigation measures are required for trees designated to be saved that are located within 50 feet of any development activity. Permit approval may require replacement of trees removed, implementation of a revegetation plan, or payment into a tree preservation fund.

Proposed trimming or other damage to Protected Trees along the proposed route shall be evaluated by a qualified arborist, who shall identify appropriate measures to minimize tree loss and shall supervise all associated activities in accordance with permit conditions issued by the responsible jurisdiction.

If the Proposed Project requires removal of trees (Protected Trees or others), a qualified forester, arborist, or restoration ecologist shall evaluate the tree replacement procedures to ensure that the replacement will be consistent with applicable local jurisdiction requirements, such as the Placer County Tree Ordinance, and with additional permit conditions imposed by the local agency (e.g., local oak tree protection requirements). Additional mitigation may be required by CDFG for impacts to riparian trees (refer to MM BIO-1c). Tree removal shall not be permitted until a qualified forester, arborist, or restoration ecologist has reviewed the following procedures (see also MM BIO-2b):

- Identification of proposed tree removal locations.

- A discussion demonstrating how maximum avoidance has been accomplished and why the trees proposed for removal cannot be avoided.
- Discussion of appropriate tree replacement ratios, as defined by the local jurisdiction, or, at a minimum, a 3:1 replacement to removed/impacted ratio for non-protected trees.
- Identification of suitable tree replacement locations within or immediately adjacent to the original tree impact area.
- Tree species and size specifications.
- Proposed understory native seed mix composition and application methods.
- Planting methodology, including spacing and proper timing of plant installation.
- Description of protective staking and caging measures.
- Description of irrigation and plant maintenance regime.
- Description of five-year monitoring effort to measure replacement success.
- Success criteria (including survival rates) and contingency measures in case of mitigation failure.
- Submission of an annual monitoring report to responsible agencies evaluating mitigation success.

Successful implementation of tree replacement shall be evaluated five years after all human support (e.g., replanting, fertilization, irrigation) has ceased. At that time, a report shall be submitted to the local jurisdiction, and CDFG, if requested, summarizing the results. A determination will be made by these agencies as to whether continued monitoring is required and/or whether contingency measures are required.

MM BIO-2b. **Avoidance of Valley Oak Woodland.** Direct and indirect impacts to the valley oak woodland located adjacent to State Route 113 would be minimized by employing trenchless excavation techniques through this area. Trenchless techniques shall be implemented west of the valley oak woodland at the point where the right-of-way (ROW) enters the dripline of the woodland. Trenchless techniques can be terminated only when the ROW exits the dripline of the woodland in the east. Either guided or unguided trenchless techniques can be employed.

<u>Rationale for Mitigation</u>

Implementation of the above mitigation measures ensures that no net loss of native trees would occur as a result of Project construction. Implementation of MM BIO-2a would ensure that all native trees within the Project site are identified and mapped; that avoided trees are identified and protected during Project construction; and that trees directly or indirectly impacted by Project construction are replaced. Implementation of MM BIO-2a reduces direct and indirect impacts to native trees to a less than significant level.

Implementation of MM BIO-2b ensures that existing mature valley oak woodland habitat is not disturbed by Project construction. Although valley oak woodland was once widespread throughout the Sacramento Valley, this habitat is now considered rare and sensitive.

Impact BIO-3: Invasive Species or Soil Pests

The Project would introduce new, or lead to the expanded range of existing, invasive noxious weed species or soil pests, so that they interfere with crop production or successful revegetation of natural communities (Potentially Significant, Class II).

Construction-related disturbance of habitats could allow invasion of weeds. Weeds are non-native opportunists that have developed reproductive features that give them a competitive advantage over many native plants. The introduction or expansion of exotic species is deleterious to native vegetation types. The introduction or expansion of exotic species may cause an impact to native species in the Project study area. Impacts to special-status plants, upland vegetation, and/or wetlands from weed invasion would be considered potentially significant (Class II). Implementation of MM BIO-3 would reduce this impact to less than significant. .

New, invasive aquatic species are not anticipated to be introduced to any wetlands or waterways as a result of Project construction. Due to the timing of construction during the dry months and limited staging requirements, invasive aquatic vegetation and animals would not be expected to be conveyed via construction vehicles or personnel working within wetlands and waterways. No construction vehicles or personnel would be working within any areas that contain invasive aquatic species that could potentially be introduced into the Project area from offsite sources.

The potential for an affected area to recruit new and invasive aquatic species during the post-construction phase could be increased as a result of construction disturbances. Implementation of APM BIO-5, APM BIO-16, APM BIO-17, APM BIO-18, APM BIO-22, and MM BIO-3 include measures that would ensure that direct and indirect impacts to aquatic habitat are avoided and minimized to the maximum extent feasible, and that all affected areas are adequately mitigated through the regulatory permitting process and the implementation of restoration and/or compensatory mitigation. Required long-term maintenance would ensure that invasive species remain absent from restored areas throughout the course of the effort.

Mitigation Measures for Impact BIO-3: Invasive Species or Soil Pests

MM BIO-3. **Prepare and Implement an Invasive Species Control Program.** Prior to Project initiation, all construction equipment shall be steam cleaned before the equipment crosses any county border to remove potential soil and/or water-borne contaminants. Equipment shall be made available for inspection by any State or county agricultural officials upon request. The California Department of Food and Agriculture, Control and Eradication Division shall be notified before equipment crosses into the state (if equipment for the Project is coming from outside of California) and county agricultural commissioners shall be notified before equipment enters their counties.

Plant materials and mud shall be cleaned from construction equipment regularly in a controlled area to avoid the spread of noxious weeds in sensitive areas (prime agricultural land, special native plant communities, and rare plant habitats).

Weed management procedures will be developed and implemented to monitor and control the spread of week populations along the pipeline.

The following measures shall be implemented to control the introduction of weed species within areas disturbed during pipeline construction; implementation of these measures during construction will be verified by the Environmental Monitor:

- Vehicles used in pipeline construction will be cleaned prior to operation off maintained roads.
- Fill material, soil amendments, gravel, etc. required for construction/restoration activities on land shall be obtained from a source that can certify the soil as being "weed free."
- Existing vegetation shall be cleared only from areas scheduled for immediate construction work (within 10 days) and only for the width needed for active construction activities.
- During pipeline construction, the upper 12 inches of topsoil (or less depending on existing depth of topsoil) shall be salvaged and replaced wherever the pipeline is trenched through open land (not including graded roads and road shoulders).
- Disturbed soils shall be revegetated with an appropriate seed mix that does not contain weeds (as defined below).

Rationale for Mitigation

There is the potential that equipment used in Project construction would be brought in from outside of the region. This equipment would have the potential to introduce new invasive weed species, soil pathogens, or aquatic invertebrates that currently do not occur within the State and/or region that could have significant ecosystem-level impacts. There is also the potential to spread weed populations during construction of the pipeline. Implementation of MM BIO-3 would reduce these impacts to a less than significant level.

Impact BIO-4: Habitat Removal or Loss of Special-Status Species

The Project would cause a temporary loss or alteration of habitat important for one or more listed species that could result in avoidance by a listed species, or that could cause increased mortality or lowered reproductive success of the species (Potentially Significant, Class II).

Twenty-nine special-status wildlife species were identified as having a moderate or high likelihood of occurring within the Project study area and being impacted by Project construction (see Table 4.4-3).

Construction of the Project has the potential to impact intact vernal pool, vernal swale, and vernal pool/vernal swale complex habitat suitable for several special-status species, including western spadefoot toad and listed vernal pool branchiopods. Much of this habitat is located within the Beale and Western Placer core areas of the Southeastern Sacramento Valley vernal pool region. It is anticipated that some of the habitat in core areas would be required for recovery of special-status species associated with vernal pool habitat (USFWS 2005). Implementation of MM BIO-1a would reduce impacts to this habitat and the wildlife species that inhabit it. Implementation of APM BIO-24 would also reduce impacts to vernal pool branchiopods to less than significant.

The Project has the potential to impact the valley elderberry longhorn beetle. Although no individuals were observed during protocol-level surveys, 23 elderberry shrubs are located within 100 feet of the Project site and exit holes were identified in several shrubs located just west of the Sacramento River (Appendix E-11, Figure 2). Direct and indirect impacts to these shrubs have the potential to reduce the abundance of the valley elderberry longhorn beetle locally and/or regionally. The Project meets the criteria for inclusion under the Programmatic Formal Consultation Permitting Projects with Relatively Small Effects on the Valley Elderberry Longhorn Beetle within the Jurisdiction of the Sacramento Field Office, California (Sacramento Fish and Wildlife Office 1996a). Implementation of MM BIO-4a would reduce impacts to less than significant.

The larger canals, sloughs and creeks throughout the Project study area provide habitat for western pond turtle, and habitat for California tiger salamander is present in the ephemeral pools and waterways and adjacent upland habitats. Implementation of MM BIO-4a would reduce impacts to these species to less than significant.

The Project traverses areas designated as Mitigation Lands by the Natomas Basin Conservancy (Figure 4.4-3). These Mitigation Lands contain foraging habitat for Swainson's hawk that nest along the adjacent Sacramento River. They also contain a drainage canal that is considered a movement corridor for giant garter snake. Impacts to these Mitigation Lands would be considered significant. Implementation of APM BIO-25 through APM BIO-28 would reduce impacts to this species.

However, implementation of MM BIO-4b would be required to reduce impacts to less than significant.

Installation of the pipeline has the potential to significantly impact Swainson's hawk nesting habitat. There are several large, native trees within the Project site, many of which have recorded occurrences of nesting by Swainson's hawk. Implementation of MM BIO-2a and MM BIO-2b would reduce impacts to avoided native trees. APM BIO-29 and APM BIO-30 would also reduce impacts to nesting bird species.

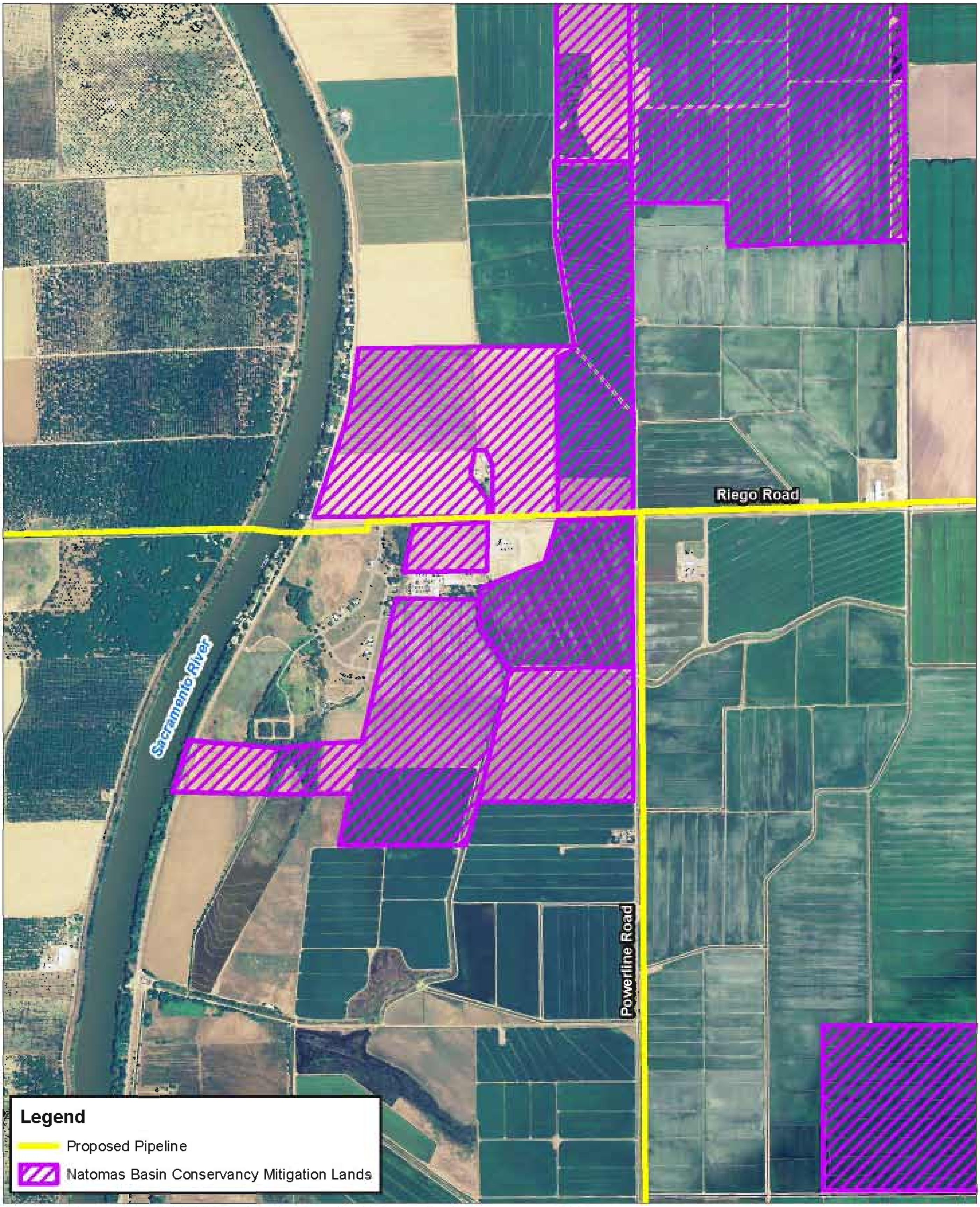
The Project also traverses the Sacramento River Ranch Conservation Bank, which is owned and operated by Wildlands, Inc (Figure 4.4-4). Areas of the Bank in the Project vicinity are croplands that provide foraging habitat for Swainson's hawk, and one parcel that is a wetlands mitigation area. Direct and/or indirect impacts to Swainson's hawk or wetlands habitat located within mitigation lands would be considered potentially significant. Implementation of MM BIO 4-a and 4-c would reduce impacts to less than significant.

Western burrowing owl was observed during surveys and has a high potential to forage and nest throughout the open grasslands and agricultural areas within the Line 406 and Line 407 West segments. Implementation of APM BIO-31 through 35 would reduce impacts to this species to less than significant.

Three bat species have potential to roost and forage in the Project site. Implementation of MM BIO-1c, MM BIO-2a, and MM-BIO-2b are expected to reduce impacts to less than significant.

American badger has the potential to occur within the proposed alignment for Line 406 West near the Dunnigan Hills. Implementation of MM BIO-4a would reduce impacts to less than significant.

Numerous bird species, including those protected under the Migratory Bird Treaty Act, have the potential to nest and forage in the Project study area. Temporary loss of foraging habitat is not considered a significant impact because implementation of MM BIO-1a, BIO-1b, BIO-1c, BIO-2a, and BIO-2b would ensure that disturbed habitats are returned to pre-construction conditions. However, impacts to nesting species would be potentially significant (Class II). Implementation of APM BIO-29 and BIO-30 would reduce impacts to nesting species. However, implementation of MM BIO-4d is required to reduce impacts to nesting bird species to less than significant.



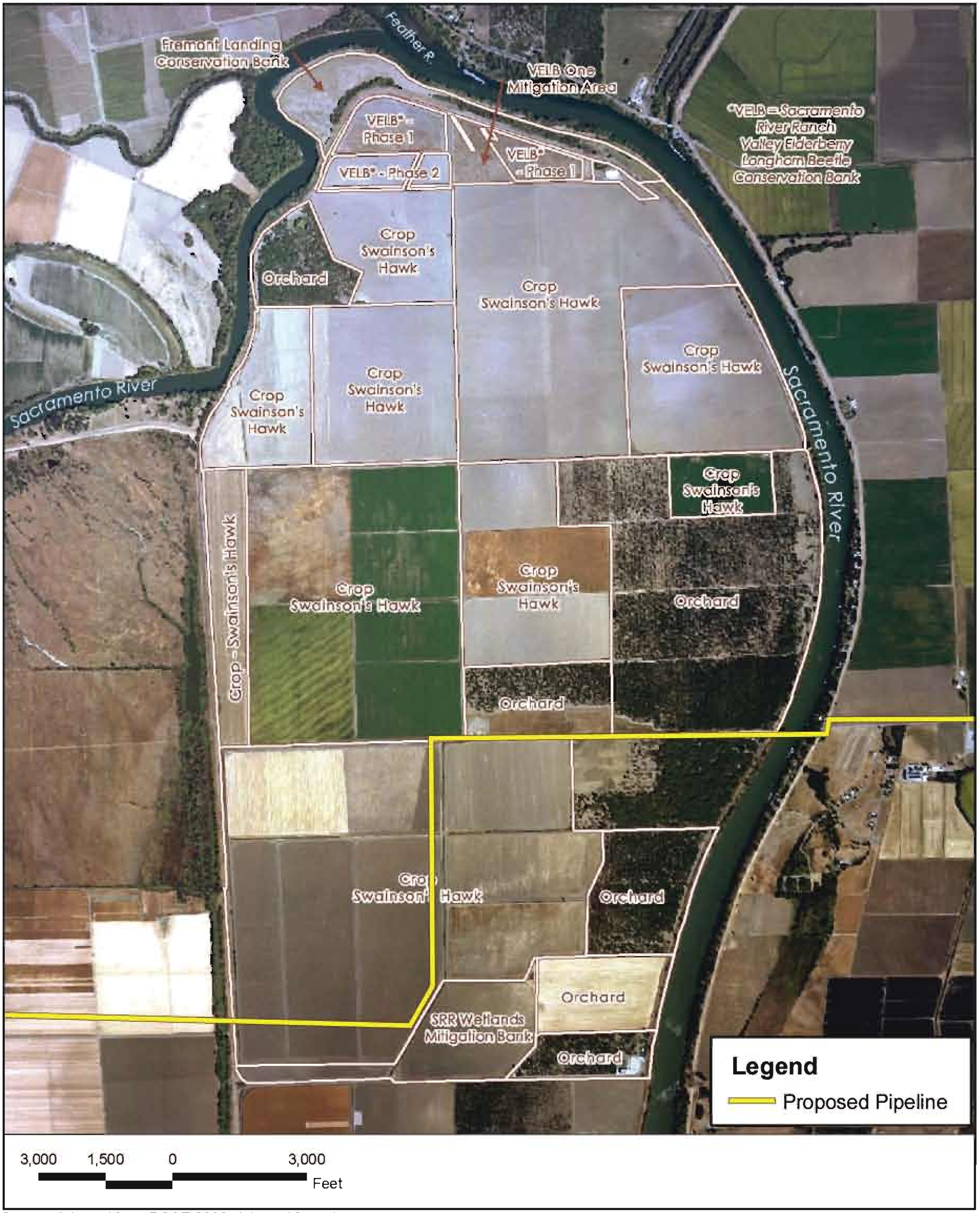
Source: Adapted from PG&E 2008, Adapted from the Natomas Basin Conservancy 2009.

Figure 4.4-3
Project Location Relative to the Natomas Basin Conservancy

Michael Brandman Associates

NORTH

2,000 1,000 0 2,000 Feet



Source: Adapted from PG&E 2008, Adapted from the Sacramento River Ranch Conservation Bank 2008.

Michael Brandman Associates

Figure 4.4-4
Project Location Relative to the
Sacramento River Ranch Conservation Bank

Mitigation Measures for Impact BIO-4: Habitat Removal or Loss of Special-Status Species

MM BIO-4a. **Protect Special-status Wildlife.** Where construction will occur within or near known or potential special-status species habitat, as defined below, PG&E shall perform the actions defined in the following paragraphs.

General Wildlife Protection During Construction. PG&E shall provide all excavated, steep-walled holes and trenches in excess of three feet in depth with one or more escape ramps constructed of earthen fill or a wood/metal plant. If wildlife-proof barricade fencing is available, it will also be used where appropriate. Escape ramps shall be less than a 45 degree angle. Trenches and pits shall be inspected for entrapped wildlife each working day before construction activities resume. Before such pits and trenches are filled, they shall be thoroughly inspected for entrapped animals. If any wildlife species are discovered, they should be allowed to escape voluntarily, without harassment, before construction activities resume, or removed from the trench or hole by a qualified biologist and allowed to escape unimpeded. All construction pipes, culverts, or similar structures that are stored at a construction site overnight shall be thoroughly inspected for trapped animals before the pipe is buried, capped, or otherwise used or moved. Pipes laid in trenches overnight shall be capped. If an animal is discovered inside a pipe, that section of the pipe shall not be capped or buried until the animal has escaped. PG&E shall not use plastic mono-filament netting (erosion control matting) or similar material because amphibians and snakes may become entangled or trapped in it. Acceptable substitutes include coconut coir matting or tackified hydroseeding compounds.

Valley Elderberry Longhorn Beetle. Prior to initiating construction, focused surveys for elderberry shrubs will be conducted within any areas not included in the Valley Elderberry Longhorn Beetle Survey performed by Galloway Consulting, Inc. (2007f) (Appendix E-11).

Elderberry shrubs shall be avoided to the greatest extent feasible. According to the Conservation Guidelines for the Valley Elderberry Longhorn Beetle (USFWS 1999), complete avoidance is assumed when a 100-foot (or wider) buffer is established and maintained around elderberry shrubs. For all shrubs that would be avoided, the following measures are required:

1. Protective fencing shall be erected around each elderberry shrub that would be avoided. The fencing shall be located no greater than 100 feet from the greatest dripline of the shrub.

2. Contractors shall be briefed on the need to avoid damage to elderberry shrubs and the possible penalties for not complying with requirements. In addition, work crews shall be instructed on the status of the beetle and the need to protect its host plant.

3. Signs shall be erected every 50 feet along the edge of the avoidance areas with the following information: "This area is habitat of the valley elderberry longhorn beetle, a threatened species, and must not be disturbed. This species is protected by the Endangered Species Act of 1973, as amended. Violators are subject to prosecution, fines, and imprisonment." The signs should be readable from a distance of 20 feet and must be maintained for the duration of construction.

For any activities that inadvertently impact avoided elderberry shrubs, the following measures are required:

1. Restore any damage done to the buffer area. Provide erosion control and revegetate with native plants.

2. No insecticides, herbicides, fertilizers, or other chemicals that might harm the beetle or its host plant shall be used in the buffer areas during either construction or maintenance activities.

3. Mowing to reduce fire hazard may occur from July through April. No mowing should occur within 5 feet of elderberry plant stems. Mowing must be done in a manner that avoids damaging plants.

The USFWS must be contacted if encroachment within the 100-foot buffer is expected, and Section 7 Federal Endangered Species Act consultation is required if elderberry bushes will be disturbed as a result of project activities. Typically, the USFWS requires a minimum setback of at least 20 feet from the dripline of each elderberry plant. If complete avoidance of elderberry plants is not possible, transplantation may be necessary as prescribed by the Guidelines. However, at the discretion of the USFWS, a plant that would be extremely difficult to move because of access problems may be exempted from transplantation (USFWS 1999). Planting of additional seedlings or cuttings may be required under the mitigation guidelines, depending upon the absence or percentage of elderberry plants with emergence holes found in the project area. The Conservation Guidelines require that each elderberry stem measuring 1 inch or greater in diameter that is impacted must be replaced, and additional native species planted. Replacement ratios for replaced shrubs and planting of native species varies depend on the diameter of the stems impacted and whether or not they are located in a riparian area. Mitigation shall occur in accordance with the mitigation ratios outlined in the guidance, and shall be approved by USFWS prior to Project implementation.

Western Pond Turtle. Where construction is to occur near known or potential habitat for western pond turtle (i.e., pipeline water crossing and near ponds), pre-construction surveys shall be conducted to determine the presence or absence of this species. If pond turtles are observed, a determination shall be made in consultation with CDFG as to whether or not construction will adversely impact this species and what measures shall be implemented. Potential impacts to this species shall be minimized through implementation of the proposed water crossing techniques (HDD, bore) outlined in Table 2-5.

California Tiger Salamander. Where construction is to occur near known or potential habitat for California tiger salamander (i.e., ephemeral pools and waterways and adjacent upland habitats), pre-construction surveys shall be conducted to determine the presence or absence of this species. If California tiger salamanders are observed, a determination shall be made in consultation with CDFG as to whether or not construction will adversely impact this species and what measures shall be implemented.

Swainson's Hawk. If project activities will occur during the breeding period (March 1 to September 15) qualified biologists shall conduct pre-construction surveys within a 0.5 mile radius of the project right-of-way, at least two weeks prior to construction. If nesting Swainson's hawks are found, project activities within 0.25 miles of the project will be delayed until the young have fledged. Swainson's hawk nest sites within 0.5 mile of active construction will be monitored by a qualified biologist to evaluate whether the construction activities are disturbing nesting hawks. If the nesting birds appear distressed, the monitor shall halt all construction activities within 0.5 mile of the nest site and CDFG will be contacted to identify appropriate contingency measures. If construction occurs between September 16 and February 28, no pre-construction surveys or other mitigation measures for Swainson's hawk will be necessary. PG&E will consult with the CDFG to determine if mitigation for the temporary loss of Swainson's hawk foraging habitat will be required. CDFG considers loss of foraging habitat within a 10-mile-radius of any active nest as an impact to this species.

American Badger. Pre-construction surveys for burrows suitable for American badger shall be conducted within suitable habitat along the proposed alignment for Line 406 West near the Dunnigan Hills no more than 30 days prior to initiation of ground disturbing activities. If no burrows are identified, no additional mitigation is required. If suitable burrows are identified, they shall be mapped and CDFG shall be consulted to determine the avoidance measures necessary to prevent direct impacts to this species.

MM BIO-4b. **Mitigation for Potential Impacts to Natomas Basin Conservancy Mitigation Lands.** Prior to Project construction, PG&E shall provide a detailed Project Description to the Natomas Basin Conservancy and shall discuss with the Conservancy the potential for impacts to Mitigation Lands. The following mitigation is required for project implementation:

1. Project construction within Mitigation Lands shall occur only during the months of November through February when Swainson's hawk is generally absent from the state;
2. Under APM BIO-16 and APM BIO-17, PG&E shall ensure that Mitigation Lands are restored to pre-construction conditions;
3. No tree located on Mitigation Lands or with canopy extending into Mitigation Lands and that is suitable for nesting by Swainson's hawk shall be directly or indirectly impacted by Project construction; and
4. If the above measures cannot be met, PG&E shall implement Alternative Option H, which avoids Natomas Basin Conservancy Mitigation Lands (Figure 3-2).

MM BIO-4c. Mitigation for Potential Impacts to Sacramento River Ranch Conservation Bank Mitigation Lands.

1. Project construction within the Conservation Bank shall occur only during the months of November through February when Swainson's hawk is generally absent from the state;
2. Under APM BIO-16 and APM BIO-17, PG&E shall ensure that Mitigation Lands are restored to pre-construction conditions;
3. No tree located on Mitigation Lands or with canopy extending into Mitigation Lands and that is suitable for nesting by Swainson's hawk shall be directly or indirectly impacted by Project construction;
4. Project construction shall not directly or indirectly impact wetlands located in the wetlands mitigation area; and
5. If the above measures cannot be met, PG&E shall implement Alternative Option H, in consultation with Sacramento River Ranch, which crosses only a very small corner of Sacramento River Ranch Conservation Bank (Figure 3-2).

MM BIO-4d. Protect Special-status Bird Species. Where construction is proposed to occur near riparian or wetland habitats (e.g., riparian wetland, willow riparian) that support special-status bird species, as defined below, PG&E shall limit construction periods to outside the respective breeding season of the affected species.

- Tricolored Blackbird, western yellow-billed cuckoo, loggerhead shrike, bank swallow. No more than two weeks prior to construction between March 1 and August 31, for project activities within 250 feet of potential nesting habitat of the tricolored blackbird, western yellow-billed cuckoo, loggerhead shrike, and bank swallow, pre-construction surveys shall be conducted to determine the presence of nesting birds. If pre-nesting or nesting activity is identified, a determination shall be made in consultation with CDFG as to whether or not construction will adversely impact nesting birds. If it is determined that construction will impact nests or nesting behavior, construction within 250 feet of the nesting locations shall be delayed until juvenile birds have fledged. The 250-foot buffer is considered an initial guideline that may be modified at specific sites following consultation with CDFG.

Protect Raptor Nests. PG&E shall avoid disturbance to active raptor nests at all locations. Pre-construction surveys shall be performed in all areas to identify potential raptor nesting sites within or near the ROW.

No pre-construction surveys shall be required if construction activities are to occur only during the non-breeding season (September 1 through January 31). If, however, construction activities are scheduled to occur during the breeding season (February 1 through August 31), pre-construction surveys of all potentially active nest sites within 500 feet of the construction corridor shall be conducted in areas that may potentially have nesting raptors, including ground nesting raptor species such as northern harrier and short-eared owl. If surveys indicate that nests are inactive or potential habitat is unoccupied during the construction period, no further mitigation shall be required.

If active nests are found, a 500-foot, no-disturbance buffer shall be established around the active nest(s). The size of individual buffers can be adjusted, following a site evaluation by a qualified raptor biologist, which shall depend upon the presence of topographical features that obstruct the line of site from the construction activities to the nest or observations of the nesting pair during construction based on the level of ongoing disturbance (e.g., farming activities or road traffic) and the observed sensitivity of the birds. Site evaluations and buffer adjustments shall be made in consultation with the local CDFG representative. The portion of the project that is within the designated buffer shall be identified in the field by staking and flagging.

Consultation to Minimize Impacts. If avoidance of sensitive wildlife species habitat is not feasible (e.g., by modifying the route or boring), PG&E shall develop appropriate mitigation in consultation with the resource agencies (CDFG and USFWS). No construction activity shall be permitted until the applicable resource agencies determine that the proposed mitigation (in the Biological Opinion) will result in less than significant impacts to the affected species.

Rationale for Mitigation

The purpose of Mitigation Measure MM BIO-4 is to define specific actions to reduce potential impacts to special-status wildlife species in the project vicinity. Effective application of this measure and all other proposed mitigation measures (BIO-1 through BIO-3) would reduce potential impacts to special-status wildlife species to less than significant levels.

Impacts and Alternatives

A No Project Alternative and twelve alternative options have been proposed for the alignment in order to minimize or eliminate environmental impacts of the proposed Project and to respond to comments from nearby landowners. Where possible, the twelve options, labeled A through L, have been analyzed in comparison to the portion of the proposed route that would be avoided by implementing the option. Descriptions of the options can be found in Section 3.0, Alternatives and Cumulative Projects, and the options are depicted in Figure 3-2A through Figure 3-2K.

In estimating the potential impacts associated with each of the twelve options, it was assumed that the potential impact corridor associated with each option included a

100-foot buffer on either side of the potential centerline (with the exception of Option L, which would simply extend the proposed Line 406-E HDD for approximately 1,000 feet to the east along Base Line Road along the existing alignment). Therefore, impact estimates for each Option assume that the entire 200-foot corridor would be potentially disturbed. This conservative estimate of impacts takes into account the potential for PG&E to place the permanent and temporary easements on either side of the proposed centerline for each Option.

APMs BIO-1 through BIO-35 would be implemented for all alternative options to avoid or minimize biological impacts. Additional mitigation measures necessary to reduce impacts to less than significant are identified under each Option, below.

Vegetation Communities and Wildlife Habitats

Potential impacts to vegetation communities and wildlife habitats for each Option and the applicable portion of the proposed Project are shown in Table 4.4-5.

No Project Alternative

The No Project Alternative would result in no impacts. Under the No Project Alternative, existing vegetation communities and wildlife habitats would remain unaltered.

Option A

Option A would result in greater potential impacts to annual grassland/ruderal and irrigated row and field crop, developed/disturbed areas, and water than the applicable portion of the proposed Project (Table 4.4-5). Option A would result in fewer potential impacts to native trees; there are 23 trees within 100 feet of Option A, and 143 trees near the equivalent portion of the proposed Project. Option A would increase the length of the pipeline by 2,200 feet, increasing the potential for the spread of invasive species or soil pests. Spill-related impacts to vegetation communities under Option A would be similar to those described for the proposed Project.

Table 4.4-5: Estimated Acreage of Vegetation Communities Subject to Potential Impacts under Alternative Options

Vegetation Community	Option A[1]	Option B[1]	Option C	Option D[1]	Option E[1]	Option F	Option G	Option H[1]	Option I	Option J	Option K	Option L
Annual Grassland/Ruderal	129.59	0.00	0.94	0.00	0.00	4.02	0.00	0.00	16.90	33.63	9.45	3.70
Developed/Disturbed	6.40	0.56	0.00	0.56	0.02	0.00	4.24	3.90	2.70	2.75	0.43	0.02
Irrigated Row and Field Crops	202.00	155.61	25.11	47.52	39.49	32.62	5.06	118.89	0.01	10.89	0.00	0.00
Orchard	0.00	0.00	2.36	0.30	17.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rice	0.00	0.00	0.00	0.00	0.00	0.00	0.00	42.22	18.50	0.95	0.00	0.00
Riparian Woodland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.00	0.00	0.00	0.00
Valley Oak Woodland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fresh Emergent Wetland	0.06	0.00	0.00	0.00	0.00	0.00	0.00	2.36	0.00	0.00	0.00	0.00
Pond	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Riparian Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Seasonal Swale	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.46	0.00	0.01	0.00
Seasonal Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.48	3.35	0.45	0.81
Vernal Pool	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.10	0.45	0.00
Vernal Swale	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.45	0.01	0.00
Willow Riparian	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water	2.67	3.38	2.65	3.62	3.81	0.21	0.00	18.80	0.90	3.61	0.00	0.00

[1] Only portions of Options A, B, D, E, and H were fully surveyed for vegetation communities and wetland resources. Therefore, acreages reported for these Options are only estimates. For areas not surveyed, the following data source was used: FRAP Mutli-source Land Cover Data, Version 2.2, 2009.
Source: Galloway Consulting Inc. 2008, CH2MHill 2008, TRC 2009, FRAP 2009.

Impacts to vegetation communities and wildlife habitats under Option A would be similar to those described for the proposed project (Class II). In addition to implementing APM 1 through APM 35, MM BIO-1 (wetlands), MM BIO-2 (trees), and MM BIO-3 (invasive species) would need to be implemented to reduce impacts to less than significant.

Option B

Option B would result in fewer potential impacts to annual grassland/ruderal and orchard communities and greater potential impacts to developed/disturbed areas, water, and irrigated row and field crops. Option B would increase the length of the pipeline by 2,640 feet, increasing the potential for the spread of invasive species or soil pests. Option B would result in greater potential impacts to native trees; there are 11 trees within 100 feet of Option B, and six trees near the equivalent portion of the proposed Project. Spill-related impacts to vegetation communities would be similar to those described for the proposed Project.

Impacts to vegetation communities and wildlife habitats under Option B would be similar to those described for the proposed project (Class II). In addition to implementing APM 1 through APM 35, MM BIO-1 (wetlands), MM BIO-2 (trees), and MM BIO-3 (invasive species) would need to be implemented to reduce impacts to less than significant.

Option C

Option C would result in greater potential impacts to annual grassland/ruderal, orchard, irrigated row and field crops, and water communities. Option C would result in greater potential impacts to native trees; there are 21 trees within 100 feet of Option C, and no trees near the equivalent portion of the proposed Project. Option C would increase the length of the pipeline by 1,150 feet, increasing the potential for the spread of invasive species or soil pests. Spill-related impacts to vegetation communities would be similar to those described for the proposed Project.

Impacts to vegetation communities and wildlife habitats under Option C would be similar to those described for the proposed project (Class II). In addition to implementing APM 1 through APM 35, MM BIO-1 (wetlands), MM BIO-2 (trees), and MM BIO-3 (invasive species) would need to be implemented to reduce impacts to less than significant.

Option D

Option D would result in greater potential impacts to orchard, irrigated row and field crops, developed/disturbed areas, and water than the applicable portion of the proposed Project. Option D would result in greater potential impacts to native trees; there are 53 trees within 100 feet of Option D, and two trees near the equivalent portion of the proposed Project. These include several large, valley oak trees located along CR-17. Spill-related impacts to vegetation communities would be similar to those described for the proposed Project.

Impacts to vegetation communities and wildlife habitats under Option D would be similar to those described for the proposed project (Class II). In addition to implementing APM 1 through APM 35, MM BIO-1 (wetlands), MM BIO-2 (trees), and MM BIO-3 (invasive species) would need to be implemented to reduce impacts to less than significant.

Option E

Option E would result in greater potential impacts to orchard, irrigated row and field crops, water, and developed/disturbed areas than the applicable portion of the proposed Project. Option E would result in greater potential impacts to native trees; there are 35 trees within 100 feet of Option E, and two trees near the equivalent portion of the proposed Project. These include several large, valley oak trees located along CR-17. Spill-related impacts to vegetation communities would be similar to those described for the proposed Project.

Impacts to vegetation communities and wildlife habitats under Option E would be similar to those described for the proposed project (Class II). In addition to implementing APM 1 through APM 35, MM BIO-1 (wetlands), MM BIO-2 (trees), and MM BIO-3 (invasive species) would need to be implemented to reduce impacts to less than significant.

Option F

Option F would result in slightly fewer potential impacts to annual grassland/ruderal and developed/disturbed areas and greater potential impacts to irrigated row and field crops and water than the applicable portion of the proposed Project. Option F would result in fewer potential impacts to native trees; there are 3 trees within 100 feet of Option F, and 9 trees near the equivalent portion of the proposed Project. Spill-related impacts to vegetation communities would be similar to those described for the proposed Project. Option F borders an ephemeral drainage with adjacent seasonal wetlands; the proposed Project avoids these features.

Impacts to vegetation communities and wildlife habitats under Option F would be similar to those described for the proposed project (Class II). In addition to implementing APM 1 through APM 35, MM BIO-1 (wetlands), MM BIO-2 (trees), and MM BIO-3 (invasive species) would need to be implemented to reduce impacts to less than significant.

Option G

Option G would result in greater potential impacts to irrigated row and field crops and developed/disturbed areas than the applicable portion of the proposed Project. Option G would result in greater potential impacts to native trees; there are 48 trees within 100 feet of Option G, and 25 trees near the equivalent portion of the proposed Project. Several of these are large valley oak trees. Spill-related impacts to vegetation communities would be similar to those described for the proposed Project.

Impacts to vegetation communities and wildlife habitats under Option G would be similar to those described for the proposed project (Class II). In addition to implementing APM 1 through APM 35, MM BIO-1 (wetlands), MM BIO-2 (trees), and MM BIO-3 (invasive species) would need to be implemented to reduce impacts to less than significant.

Option H

Option H would result in fewer potential impacts to annual grassland/ruderal, developed/disturbed areas, and orchard vegetation communities. However, Option H would result in greater potential impacts to irrigated row and field crops, rice, water, and riparian woodland communities. Option H would result in greater potential impacts to native trees; there are 86 trees within 100 feet of Option H, and 59 trees near the equivalent portion of the proposed Project. Option H crosses a large seasonal wetland on West Elverta Road; the proposed Project avoids this feature. Option H also crosses Steelhead Creek and crosses more area in the Yolo Bypass. Spill-related impacts to vegetation communities would be similar to those described for the proposed Project.

Impacts to vegetation communities and wildlife habitats under Option H would be similar to those described for the proposed project (Class II). In addition to implementing APM 1 through APM 35, MM BIO-1 (wetlands), MM BIO-2 (trees), and MM BIO-3 (invasive species) would need to be implemented to reduce impacts to less than significant.

Option I

Option I would result in greater potential impacts to annual grassland/ruderal areas, rice, and water, and fewer potential impacts to irrigated row and field crops and developed/disturbed areas. Option I crosses additional seasonal wetlands, seasonal swales, a vernal pool, and Steelhead Creek. Option I would result in fewer potential impacts to native trees; there are 42 trees within 100 feet of Option I, and 79 trees near the equivalent portion of the proposed Project. Spill-related impacts to vegetation communities would be similar to those described for the proposed Project.

Impacts to vegetation communities and wildlife habitats under Option I would be similar to those described for the proposed project (Class II). In addition to implementing APM 1 through APM 35, MM BIO-1 (wetlands), MM BIO-2 (trees), and MM BIO-3 (invasive species) would need to be implemented to reduce impacts to less than significant.

Option J

Option J would result in greater potential impacts to annual grassland/ruderal areas, irrigated row and field crops, and rice, and fewer potential impacts to developed/disturbed areas and waters. Option J crosses additional seasonal wetlands, seasonal swales, and a vernal pool feature. Option J would result in slightly fewer potential impacts to native trees; there are 77 trees within 100 feet of Option J, and 79 trees near the equivalent portion of the proposed Project. Spill-related impacts to vegetation communities would be similar to those described for the proposed Project.

Impacts to vegetation communities and wildlife habitats under Option J would be similar to those described for the proposed project (Class II). In addition to implementing APM 1 through APM 35, MM BIO-1 (wetlands), MM BIO-2 (trees), and BIO-3 (invasive species) would need to be implemented to reduce impacts to less than significant.

Option K

Option K would result in greater potential impacts to annual grassland/ruderal and developed/disturbed areas. Option K crosses an additional vernal pool, vernal swale, seasonal swales, and seasonal wetlands. Spill-related impacts to vegetation communities would be similar to those described for the proposed Project. There are no trees within 100 feet of Option K or the equivalent portion of the proposed Project.

Impacts to vegetation communities and wildlife habitats under Option K would be similar to those described for the proposed project (Class II). In addition to implementing APM 1 through APM 35, MM BIO-1 (wetlands), MM BIO-2 (trees), and MM BIO-3 (invasive species) would need to be implemented to reduce impacts to less than significant.

Option L

Under Option L, impacts to vegetation communities and wildlife habitats, including the potential for the spread of invasive species or soil pests, would be similar to the proposed Project. Spill-related impacts to vegetation communities would be similar to those described for the proposed Project. There are no trees within 100 feet of Option L or the equivalent portion of the proposed Project. There is a seasonal wetland within 100 feet of the pipeline alignment but outside of the Project site.

Impacts to vegetation communities and wildlife habitats under Option L would be similar to those described for the proposed project (Class II). In addition to implementing APM 1 through APM 35, MM BIO-1 (wetlands), MM BIO-2 (trees), and MM BIO-3 (invasive species) would need to be implemented to reduce impacts to less than significant.

Table 4.4-6: Comparison of Alternatives for Vegetation Communities and Wildlife Habitats

Alternative	Comparison with Proposed Project
No Project	No Impacts
Option A	Similar Impacts
Option B	Similar Impacts
Option C	Similar Impacts

Alternative	Comparison with Proposed Project
Option D	Similar Impacts
Option E	Similar Impacts
Option F	Similar Impacts
Option G	Similar Impacts
Option H	Similar Impacts
Option I	Similar Impacts
Option J	Similar Impacts
Option K	Similar Impacts
Option L	Similar Impacts
Source: Michael Brandman Associates 2009.	

Waters of the U.S., Including Wetlands

No Project Alternative

The No Project Alternative would result no impacts compared to the proposed Project. Under the No Project Alternative, existing waters of the U.S., including wetlands, would remain unaltered.

Option A

Option A could result in additional impacts to waters of the U.S., including wetlands (Class II). Similar to the proposed Project, Option A would require the crossing of Hungry Hollow Canal, Smith Creek, and various unnamed irrigation canals between its origin at Lines 400 and 401 and its terminus and tie-in point at Line 172A and Line 407. Similar to the proposed Project, these crossings would be conducted using open-cut trenching methodologies. From aerial photos, it appears that a portion of Option A that parallels CR-15B would cross several drainages and seasonal wetlands; vernal pools may be present as well (NAIP 2005). Option A has the potential to increase the level of impacts to waters of the state and waters of the U.S., including wetlands. In addition to implementing APM 1 through APM 35, MM BIO-1 (wetlands) would need to be implemented to reduce impacts to less than significant.

Option B

Option B could result in additional impacts to waters of the U.S., including wetlands (Class II). Similar to the proposed Project, Option B requires the crossing of Hungry Hollow Canal and various unnamed irrigation canals between its origin at Lines 400 and 401 and its terminus and tie-in point immediately east of I-505. From aerial photos, it appears that Option B would cross Goodnow Slough, Hungry Hollow, and several irrigation/drainage ditches. In addition to implementing APM 1 through APM 35, MM BIO-1 (wetlands) would need to be implemented to reduce impacts to less than significant.

Option C

Option C would result in impacts to waters of the U.S., including wetlands, similar to those of the proposed Project (Class II). Jurisdictional delineations of waters of the U.S., including wetlands, were conducted within Option C along with those covering the Project study area (Gallaway Consulting 2007a, 2008a, 2008b; CH2MHill 2008). Similar to the proposed Project, Option C requires the crossing of Hungry Hollow Canal at its departure point from the proposed Line 406. In addition to implementing APM 1 through APM 35, MM BIO-1 (wetlands) would need to be implemented to reduce impacts to less than significant.

Option D

Option D would result in impacts to waters of the U.S., including wetlands, similar to those of the proposed Project (Class II). From aerial photos, it appears that Option D would cross two irrigation laterals. In addition to implementing APM 1 through APM 35, MM BIO-1 (wetlands) would need to be implemented to reduce impacts to less than significant.

Option E

Option E would result in impacts to waters of the U.S., including wetlands, similar to those of the proposed Project (Class II). From aerial photos, it appears that Option E would cross two irrigation laterals. In addition to implementing APM 1 through APM 35, MM BIO-1 (wetlands) would need to be implemented to reduce impacts to less than significant.

Option F

Option F would result in similar impacts to waters of the U.S., including wetlands, relative to the proposed Project (Class II). Jurisdictional delineations of waters of the U.S., including wetlands, were conducted within Option F along with those covering the Project study area (Gallaway Consulting 2007a, 2008a, 2008b; CH2MHill 2008). Similar to the proposed Project, Option F would include the crossing of an unnamed irrigation canal west of the intersection of CR-17 and CR-96. From aerial photos, it appears that Option F borders an ephemeral drainage (0.21 acre) with adjacent seasonal wetlands; the proposed Project avoids these features. In addition to implementing APM 1 through APM 35, MM BIO-1 (wetlands) would need to be implemented to reduce impacts to less than significant.

Option G

Option G would result in impacts to waters of the U.S., including wetlands, similar to those of the proposed Project (Class II). Jurisdictional delineations of waters of the U.S., including wetlands, were conducted within Option G along with those covering the Project study area (Gallaway Consulting 2007a, 2008a, 2008b; CH2MHill 2008). Option G does not traverse any additional waters or wetlands.

Option H

Option H would result in additional impacts to waters of the U.S., including wetlands (Class II). Alternative H crosses a large seasonal wetland on West Elverta Road; the proposed Project avoids this feature. Option H would increase the distance of the crossing of the Yolo Bypass and would also cross the Tule Canal, Steelhead Creek, and the Sacramento River. Option H would increase the potential for impacts to sensitive wetland vegetation communities and habitats. In addition to implementing APM 1 through APM 35, MM BIO-1 (wetlands) would need to be implemented to reduce impacts to less than significant.

Option I

Option I was evaluated for wetland resources on January 20 and 21, 2008 (PG&E 2009; Appendix C-1). Option I would result in additional impacts to waters of the U.S., including wetlands (Class II). Option I crosses additional seasonal wetlands (0.48 acre), seasonal swales (0.46 acre), a vernal pool (0.04 acre), and Steelhead Creek (0.90 acre). In addition to implementing APM 1 through APM 35, MM BIO-1 (wetlands) would need to be implemented to reduce impacts to less than significant.

Option J

Option J was evaluated for wetland resources on January 20 and 21, 2008 (PG&E 2009; Appendix C-1). Option J would result in additional impacts to waters of the U.S., including wetlands (Class II). Option J crosses additional seasonal wetlands (3.35 acres), vernal swales (0.45 acre), a vernal pool feature (0.10 acre), and waters including Steelhead Creek and several irrigation ditches (3.61 acres). In addition to implementing APM 1 through APM 35, MM BIO-1 (wetlands) would need to be implemented to reduce impacts to less than significant.

Option K

Jurisdictional delineations of waters of the U.S., including wetlands, were conducted within Option K along with those covering the Project study area (Gallaway Consulting 2007a, 2008a, 2008b; CH2MHill 2008). Option K would result in additional impacts to waters of the U.S., including wetlands (Class II). Option K crosses an additional vernal pool (0.45 acre), vernal swale (0.01 acre), seasonal swale (0.01 acre), and seasonal wetlands (0.45 acre). In addition to implementing APM 1 through APM 35, MM BIO-1 (wetlands) would need to be implemented to reduce impacts to less than significant.

Option L

Option L would result in impacts to waters of the U.S., including wetlands, similar to those of the proposed Project (Class II) since Option L follows the proposed alignment. Option L does not traverse any additional waters and wetlands.

Table 4.4-7: Comparison of Alternatives for Waters of the U.S., Including Wetlands

Alternative	Comparison with Proposed Project
No Project	No Impacts
Option A	Greater Impacts
Option B	Greater Impacts
Option C	Similar Impacts
Option D	Similar Impacts
Option E	Similar Impacts
Option F	Similar Impacts

Option G	Similar Impacts
Option H	Greater Impacts
Option I	Greater Impacts
Option J	Greater Impacts
Option K	Greater Impacts
Option L	Similar Impacts
Source: Michael Brandman Associates 2009.	

Special-Status Plant Species

No Project Alternative

The No Project Alternative would result in no impacts compared to the proposed Project. Under the No Project Alternative, any existing special-status plant populations would remain unaltered.

Option A

Option A may result in additional impacts to special-status plant species (Class II). Option A would cross annual grassland/ruderal, developed/disturbed, irrigated row and field crops, and water communities. Similar to the proposed Project, Option A would require the crossing of Hungry Hollow Canal, Smith Creek, and various unnamed irrigation canals and seasonal wetlands; vernal pools and fresh emergent wetland may be present as well. Option A would increase the potential for impacts to special-status plant species. Protocol-level surveys for plant species with potential to occur in habitat types crossed by Option A would be required.

Impact BIO-5: Construction Impacts on Special-status Plant Species

The Project would result in direct or indirect impact on special-status plant species that could reduce the abundance or substantially reduce the species numbers of special-status plant species (Potentially Significant, Class II).

There are 23 special-status plant species that have the potential to occur within the areas crossed by Option A. Construction and related activities causing direct impacts to special-status plant species or its habitat would be considered potentially significant (Class II). Implementation of MM BIO-5, requiring appropriately timed pre-construction surveys to map and flag locations supporting these species (if located) for avoidance during construction, would reduce this impact to less than significant levels. The loss of individuals or known habitats of rare, threatened, or endangered plant species would be considered a significant impact. Construction activities resulting in the removal of a special-status plant species would be considered potentially significant (Class II).

Mitigation Measures for Impact BIO-5: Special-status Plant Species

MM BIO-5. **Rare Plant Avoidance.** PG&E shall avoid impacts to special-status plant species by:

- Having a qualified biologist conduct habitat classification surveys along unsurveyed portions of the alignment.
- Conducting pre-construction surveys during the appropriate flowering period for special-status plant species with potential to occur within un-surveyed locations of the proposed right-of-way.
- Flagging, mapping, and fencing to protect any special-status plant species within the 200-foot-wide study area during construction.
- Limiting all proposed roadway construction to the existing roadway surface(s) where adjacent special-status plant species occur.

Prior to construction, the location of special-status plant species will be determined through appropriately-timed surveys according to established botanical protocol (e.g., CNPS, CDFG). Determination of potential habitat for rare species, and surveys conducted for presence of rare plant species will be performed by a qualified botanist. These surveys will be appropriately timed to cover the blooming periods of the special-status plant species with the potential to occur in the area.

Any rare plant species within the study area (including the 100 foot-wide right-of-way and a 50 foot-wide buffer zone on each side of the right-of-way, work areas, staging areas, and/or launcher/receiver stations) will be flagged, accurately mapped on construction plans, and fenced to protect the area occupied by the species during construction, per APM BIO-3.

Compliance with these measures prior to and during construction will be supervised and verified by the Environmental Monitor per APM BIO-6.

Option B

Option B may result in additional impacts to special-status plant species (Class II). Option B would cross developed/disturbed, irrigated row and field crops, and water communities. Similar to the proposed Project, Option B requires the crossing of Hungry Hollow Canal and various unnamed irrigation canals Seasonal wetlands may be present as well. Option B would increase the potential for impacts to special-status plant species. Protocol-level surveys for plant species with potential to occur in habitat types crossed by Option B would be required. Implementation of MM BIO-5 would reduce this impact to less than significant.

Option C

Under Option C, impacts to special-status plant species would be similar to the proposed Project (Class III). Surveys for the special-status plant species having potential to occur within this Option were conducted within all suitable habitats on May 5 and 12, and July 21, 24, and 26, 2006; on May 3, 8, and 14, 2007; and on May 31 and June 1, 2007. The area traversed by Option C does not contain any special-status plant species.

Option D

Option D may result in additional impacts to special-status plant species (Class II). Option D would cross orchard, irrigated row and field crops, developed/disturbed areas, and water. From aerial photos, it appears that Option D would cross two irrigation laterals. Wetland habitats may be present as well. Option D would increase the potential for impacts to special-status plant species. Protocol-level surveys for plant species with potential to occur in habitat types crossed by Option D would be required. Implementation of MM BIO-5 would reduce this impact to less than significant.

Option E

Option E may result in additional impacts to special-status plant species (Class II). Option E would cross orchard, irrigated row and field crops, water, and developed/disturbed areas. From aerial photos, it appears that Option E would cross two irrigation laterals. Wetland habitats may be present as well. Option E would increase the potential for impacts to special-status plant species. Protocol-level surveys for plant species with potential to occur in habitat types crossed by Option E would be required. Implementation of MM BIO-5 would reduce this impact to less than significant.

Option F

Under Option F, impacts to special-status plant species would be similar to the proposed Project (Class III). Surveys for the special-status plant species having potential to occur within this Option were conducted within all suitable habitats on May 5 and 12, and July 21, 24, and 26, 2006; on May 3, 8, and 14, 2007; and on May 31 and June 1, 2007. The area traversed by Option F does not contain any special-status plant species.

Option G

Under Option G, impacts to special-status plant species would be similar to the proposed Project (Class III). Surveys for the special-status plant species having potential to occur within this Option were conducted within all suitable habitats on May 5 and 12, and July 21, 24, and 26, 2006; on May 3, 8, and 14, 2007; and on May 31 and June 1, 2007. The area traversed by Option G does not contain any special-status plant species.

Option H

Option H may result in additional impacts to special-status plant species (Class II). Option H would cross annual grassland/ruderal, developed/disturbed areas, orchard vegetation communities, irrigated row and field crops, rice, water, and riparian woodland communities. Alternative H crosses a large seasonal wetland on West Elverta Road; the proposed Project avoids this feature. Option H would increase the distance of the crossing of the Yolo Bypass and would also cross the Tule Canal, Steelhead Creek, and the Sacramento River. Option H would increase the potential for impacts to special-status species, particularly hydrophytes. Implementation of MM BIO-5 would reduce this impact to less than significant.

Option I

Option I may result in additional impacts to special-status plant species (Class II). Option I would cross annual grassland/ruderal areas, rice, water, irrigated row and field crops, and developed/disturbed areas. Option I crosses additional seasonal wetlands, seasonal swales, a vernal pool, and Steelhead Creek. Option I would increase the potential for impacts to special-status species, particularly hydrophytes. Protocol-level surveys for plant species with potential to occur in habitat types crossed by Option I would be required. Implementation of MM BIO-5 would reduce this impact to less than significant.

Option J

Option J may result in additional impacts to special-status plant species (Class II). Option I would cross annual grassland/ruderal areas, irrigated row and field crops, rice, developed/disturbed areas, and waters. Option J crosses additional seasonal wetlands, seasonal swales, and a vernal pool feature. Option J would increase the potential for impacts to special-status species, particularly hydrophytes. Protocol-level surveys for plant species with potential to occur in habitat types crossed by Option J would be required. Implementation of MM BIO-5 would reduce this impact to less than significant.

Option K

Under Option K, impacts to special-status plant species would be similar to the proposed Project (Class III). Surveys for the special-status plant species having potential to occur within this Option were conducted within all suitable habitats on May 5 and 12, and July 21, 24, and 26, 2006; on May 3, 8, and 14, 2007; and on May 31 and June 1, 2007. The area traversed by Option K does not contain any special-status plant species.

Option L

Under Option L, impacts to special-status plant species would be similar to the proposed Project (Class III). Surveys for the special-status plant species having potential to occur within this Option were conducted within all suitable habitats on May 5 and 12, and July 21, 24, and 26, 2006; on May 3, 8, and 14, 2007; and on May 31 and June 1, 2007. The area traversed by Option L does not contain any special-status plant species.

Table 4.4-8: Comparison of Alternatives for Special-Status Plant Species

Alternative	Comparison with Proposed Project
No Project	No Impacts
Option A	Greater Impacts

Alternative	Comparison with Proposed Project
Option B	Greater Impacts
Option C	Similar Impacts
Option D	Greater Impacts
Option E	Greater Impacts
Option F	Similar Impacts
Option G	Similar Impacts
Option H	Greater Impacts
Option I	Greater Impacts
Option J	Greater Impacts
Option K	Similar Impacts
Option L	Similar Impacts
Source: Michael Brandman Associates 2009.	

Special-Status Wildlife Species

No Project Alternative

The No Project Alternative would result in no impacts compared to the proposed Project. Under the No Project Alternative, special-status species and their habitats would not have the potential to be impacted by the Project.

Option A

Option A would result in similar impacts to special-status wildlife species relative to the proposed Project (Class II).

Potential impacts related to spills or leaks / health hazard impacts on special-status wildlife species would be less than significant with implementation of APM HAZ-2, APM BIO-5, APM BIO-7, APM BIO-13, APM BIO-14, APM BIO-23, and APM BIO-35

Interference with the movement or range of wildlife species would be a less than significant impact with implementation of APM BIO-1, APM BIO-2, APM BIO-4, APM BIO-5, APM BIO-6, APM BIO-15, APM BIO-16, APM BIO-17, APM BIO-20, APM BIO-21, APM BIO-22, and APM BIO-35.

Implementation of MM BIO-1a, 1b, and 1c would reduce impacts to wetland-dependent species to less than significant. Implementation of APM BIO-24 would also reduce impacts to vernal pool branchiopods to less than significant.

Option A would result in fewer potential impacts to nesting birds; there are up to 23 potential nesting trees within 100 feet of Option A, and 143 potential nesting trees near the equivalent portion of the proposed Project. Similarly, there are 53 potential nesting trees within 250 feet of Option A, and 288 trees near the equivalent portion of the proposed Project. Implementation of MM BIO-2a and 2b, and BIO-4a and 4d would reduce impacts to tree-dependent species to less than significant.

Impact BIO-4, Habitat Removal or Loss of Special-status Species, discusses potential impacts to the 29 special-status wildlife species that were identified as having a moderate or high likelihood of occurring within the Project study area and being impacted by Project construction (see Table 4.4-3). In addition to implementing APM 1 through APM 35, implementation of MM BIO-4a and 4d would reduce impacts to special-status wildlife species to less than significant.

Option B

Option B would result in impacts to special-status wildlife species similar to those of the proposed Project (Class II).

Potential impacts related to spills or leaks / health hazard impacts on special-status wildlife species would be less than significant with implementation of APM HAZ-2, APM BIO-5, APM BIO-7, APM BIO-13, APM BIO-14, APM BIO-23, and APM BIO-35

Interference with the movement or range of wildlife species would be a less than significant impact with implementation of APM BIO-1, APM BIO-2, APM BIO-4, APM BIO-5, APM BIO-6, APM BIO-15, APM BIO-16, APM BIO-17, APM BIO-20, APM BIO-21, APM BIO-22, and APM BIO-35.

Implementation of MM BIO-1a, 1b, and 1c would reduce impacts to wetland-dependent species to less than significant. Implementation of APM BIO-24 would also reduce impacts to vernal pool branchiopods to less than significant.

Option B would result in slightly greater potential impacts to nesting birds; there are up to 11 potential nesting trees within 100 feet of Option B, and 6 potential nesting trees near the equivalent portion of the proposed Project. Similarly, there are 28 potential nesting trees within 250 feet of Option B, and 26 trees near the equivalent portion of the proposed Project. Implementation of MM BIO-2a and 2b, and BIO-4a and 4d would reduce impacts to tree-dependent species to less than significant.

Impact BIO-4, Habitat Removal or Loss of Special-status Species, discusses potential impacts to the 29 special-status wildlife species that were identified as having a moderate or high likelihood of occurring within the Project study area and being impacted by Project construction (see Table 4.4-3). In addition to implementing APM 1 through APM 35, implementation of MM BIO-4a and 4d would reduce impacts to special-status wildlife species to less than significant.

Option C

Option C would result in impacts to special-status wildlife species similar to those of the proposed Project (Class II). Potential impacts related to spills or leaks / health hazard impacts on special-status wildlife species would be less than significant with implementation of APM HAZ-2, APM BIO-5, APM BIO-7, APM BIO-13, APM BIO-14, APM BIO-23, and APM BIO-35

Interference with the movement or range of wildlife species would be a less than significant impact with implementation of APM BIO-1, APM BIO-2, APM BIO-4, APM BIO-5, APM BIO-6, APM BIO-15, APM BIO-16, APM BIO-17, APM BIO-20, APM BIO-21, APM BIO-22, and APM BIO-35.

Implementation of MM BIO-1a, 1b, and 1c would reduce impacts to wetland-dependent species to less than significant. Implementation of APM BIO-24 would also reduce impacts to vernal pool branchiopods to less than significant.

Option C would result in greater potential impacts to nesting birds; there are up to 21 potential nesting trees within 100 feet of Option C, and no potential nesting trees near the equivalent portion of the proposed Project. Similarly, there are 5 potential nesting trees within 250 feet of Option C, and 2 trees near the equivalent portion of the proposed Project. Implementation of MM BIO-2a and 2b, and BIO-4a and 4d would reduce impacts to tree-dependent species to less than significant.

Impact BIO-4, Habitat Removal or Loss of Special-status Species, discusses potential impacts to the 29 special-status wildlife species that were identified as having a moderate or high likelihood of occurring within the Project study area and being impacted by Project construction (see Table 4.4-3). In addition to implementing APM 1 through APM 35, implementation of MM BIO-4a and 4d would reduce impacts to special-status wildlife species to less than significant.

Option D

Option D would result in impacts to special-status wildlife species similar to those of the proposed Project (Class II). Potential impacts related to spills or leaks / health hazard impacts on special-status wildlife species would be less than significant with implementation of APM HAZ-2, APM BIO-5, APM BIO-7, APM BIO-13, APM BIO-14, APM BIO-23, and APM BIO-35

Interference with the movement or range of wildlife species would be a less than significant impact with implementation of APM BIO-1, APM BIO-2, APM BIO-4, APM BIO-5, APM BIO-6, APM BIO-15, APM BIO-16, APM BIO-17, APM BIO-20, APM BIO-21, APM BIO-22, and APM BIO-35.

Implementation of MM BIO-1a, 1b, and 1c would reduce impacts to wetland-dependent species to less than significant. Implementation of APM BIO-24 would also reduce impacts to vernal pool branchiopods to less than significant.

Option D would result in greater potential impacts to nesting birds; there are up to 53 potential nesting trees within 100 feet of Option D, and 2 potential nesting trees near the equivalent portion of the proposed Project. Similarly, there are 65 potential nesting trees within 250 feet of Option D, and 10 trees near the equivalent portion of the proposed Project. Implementation of MM BIO-2a and 2b, and BIO-4a and 4d would reduce impacts to tree-dependent species to less than significant.

Impact BIO-4, Habitat Removal or Loss of Special-status Species, discusses potential impacts to the 29 special-status wildlife species that were identified as having a moderate or high likelihood of occurring within the Project study area and being impacted by Project construction (see Table 4.4-3). In addition to implementing APM 1 through APM 35, implementation of MM BIO-4a and 4d would reduce impacts to special-status wildlife species to less than significant.

Option E

Option E would result in impacts to special-status wildlife species similar to those of the proposed Project (Class II). Potential impacts related to spills or leaks / health hazard impacts on special-status wildlife species would be less than significant with implementation of APM HAZ-2, APM BIO-5, APM BIO-7, APM BIO-13, APM BIO-14, APM BIO-23, and APM BIO-35

Interference with the movement or range of wildlife species would be a less than significant impact with implementation of APM BIO-1, APM BIO-2, APM BIO-4, APM

BIO-5, APM BIO-6, APM BIO-15, APM BIO-16, APM BIO-17, APM BIO-20, APM BIO-21, APM BIO-22, and APM BIO-35.

Implementation of MM BIO-1a, 1b, and 1c would reduce impacts to wetland-dependent species to less than significant. Implementation of APM BIO-24 would also reduce impacts to vernal pool branchiopods to less than significant.

Option E would result in greater potential impacts to nesting birds; there are up to 35 potential nesting trees within 100 feet of Option E, and 2 potential nesting trees near the equivalent portion of the proposed Project. Similarly, there are 39 potential nesting trees within 250 feet of Option E, and 10 trees near the equivalent portion of the proposed Project. In addition to the APMs, implementation of MM BIO-2a and 2b, and BIO-4a and 4d would reduce impacts to tree-dependent species to less than significant.

Impact BIO-4, Habitat Removal or Loss of Special-status Species, discusses potential impacts to the 29 special-status wildlife species that were identified as having a moderate or high likelihood of occurring within the Project study area and being impacted by Project construction (see Table 4.4-3). In addition to implementing APM 1 through APM 35, implementation of MM BIO-4a and 4d would reduce impacts to special-status wildlife species to less than significant.

Option F

Option F would result in impacts to special-status wildlife species similar to those of the proposed Project (Class II). Potential impacts related to spills or leaks / health hazard impacts on special-status wildlife species would be less than significant with implementation of APM HAZ-2, APM BIO-5, APM BIO-7, APM BIO-13, APM BIO-14, APM BIO-23, and APM BIO-35

Interference with the movement or range of wildlife species would be a less than significant impact with implementation of APM BIO-1, APM BIO-2, APM BIO-4, APM BIO-5, APM BIO-6, APM BIO-15, APM BIO-16, APM BIO-17, APM BIO-20, APM BIO-21, APM BIO-22, and APM BIO-35.

Implementation of MM BIO-1a, 1b, and 1c would reduce impacts to wetland-dependent species to less than significant. Implementation of APM BIO-24 would also reduce impacts to vernal pool branchiopods to less than significant.

Option F would result in fewer potential impacts to nesting birds; there are up to 3 potential nesting trees within 100 feet of Option F, and 9 potential nesting trees near the equivalent portion of the proposed Project. Similarly, there are 40 potential nesting trees within 250 feet of Option F, and 81 trees near the equivalent portion of the proposed Project. Implementation of MM BIO-2a and 2b, and BIO-4a and 4d would reduce impacts to tree-dependent species to less than significant.

Impact BIO-4, Habitat Removal or Loss of Special-status Species, discusses potential impacts to the 29 special-status wildlife species that were identified as having a moderate or high likelihood of occurring within the Project study area and being impacted by Project construction (see Table 4.4-3). In addition to implementing APM 1 through APM 35, implementation of MM BIO-4a and 4d would reduce impacts to special-status wildlife species to less than significant.

Option G

Option G would result in impacts to special-status wildlife species similar to those of the proposed Project (Class II). Potential impacts related to spills or leaks / health hazard impacts on special-status wildlife species would be less than significant with implementation of APM HAZ-2, APM BIO-5, APM BIO-7, APM BIO-13, APM BIO-14, APM BIO-23, and APM BIO-35

Interference with the movement or range of wildlife species would be a less than significant impact with implementation of APM BIO-1, APM BIO-2, APM BIO-4, APM BIO-5, APM BIO-6, APM BIO-15, APM BIO-16, APM BIO-17, APM BIO-20, APM BIO-21, APM BIO-22, and APM BIO-35.

Implementation of MM BIO-1a, 1b, and 1c would reduce impacts to wetland-dependent species to less than significant. Implementation of APM BIO-24 would also reduce impacts to vernal pool branchiopods to less than significant.

Option G would result in slightly greater potential impacts to nesting birds; there are up to 48 potential nesting trees within 100 feet of Option G, and 25 potential nesting trees near the equivalent portion of the proposed Project. However, there are 48 potential nesting trees within 250 feet of Option G, and 68 trees near the equivalent portion of the proposed Project. Implementation of MM BIO-2a and 2b, and BIO-4a and 4d would reduce impacts to tree-dependent species to less than significant.

Impact BIO-4, Habitat Removal or Loss of Special-status Species, discusses potential impacts to the 29 special-status wildlife species that were identified as having a moderate or high likelihood of occurring within the Project study area and being impacted by Project construction (see Table 4.4-3). In addition to implementing APM 1 through APM 35, implementation of MM BIO-4a and 4d would reduce impacts to special-status wildlife species to less than significant.

Option H

Option H would result in impacts to special-status wildlife species similar to those of the proposed Project (Class II). Option H would involve a greater amount of trenching through the Yolo Bypass, which has the potential to support special-status species. Option H avoids Natomas Basin Conservancy Mitigation Lands set aside for Swainson's hawk and giant garter snake. Option H also avoids Sacramento River Ranch Mitigation Bank lands set aside for Swainson's hawk and for wetlands. Option H also avoids 19 of the 23 elderberry shrubs that occur within 100 feet of the construction workspace.

Potential impacts related to spills or leaks / health hazard impacts on special-status wildlife species would be less than significant with implementation of APM HAZ-2, APM BIO-5, APM BIO-7, APM BIO-13, APM BIO-14, APM BIO-23, and APM BIO-35

Interference with the movement or range of wildlife species would be a less than significant impact with implementation of APM BIO-1, APM BIO-2, APM BIO-4, APM BIO-5, APM BIO-6, APM BIO-15, APM BIO-16, APM BIO-17, APM BIO-20, APM BIO-21, APM BIO-22, and APM BIO-35.

Implementation of MM BIO-1a, 1b, and 1c would reduce impacts to wetland-dependent species to less than significant. Implementation of APM BIO-24 would also reduce impacts to vernal pool branchiopods to less than significant.

Option H would result in greater potential impacts to nesting birds; there are up to 86 potential nesting trees within 100 feet of Option H, and 59 potential nesting trees near the equivalent portion of the proposed Project. Similarly, there are 163 potential nesting trees within 250 feet of Option H, and 127 trees near the equivalent portion of the proposed Project.

Implementation of MM BIO-2a and 2b, and BIO-4a and 4d would reduce impacts to tree-dependent species to less than significant.

Impact BIO-4, Habitat Removal or Loss of Special-status Species, discusses potential impacts to the 29 special-status wildlife species that were identified as having a moderate or high likelihood of occurring within the Project study area and being impacted by Project construction (see Table 4.4-3). In addition to implementing APM 1 through APM 35, implementation of MM BIO-4a and 4d would reduce impacts to special-status wildlife species to less than significant.

Option I

Option I would have the potential to result in impacts to special-status wildlife species similar to those of the proposed Project (Class II). Potential impacts related to spills or leaks / health hazard impacts on special-status wildlife species would be less than significant with implementation of APM HAZ-2, APM BIO-5, APM BIO-7, APM BIO-13, APM BIO-14, APM BIO-23, and APM BIO-35

Interference with the movement or range of wildlife species would be a less than significant impact with implementation of APM BIO-1, APM BIO-2, APM BIO-4, APM BIO-5, APM BIO-6, APM BIO-15, APM BIO-16, APM BIO-17, APM BIO-20, APM BIO-21, APM BIO-22, and APM BIO-35.

Several seasonal wetland features are located along Option I, and Option I is within 250 feet of a delineated vernal pool that may provide potential habitat for vernal pool invertebrates. Option I may result in direct impacts to vernal pools that are suitable habitat for special-status vernal pool branchiopods and plant species. However, it is anticipated that a majority of these features would be avoided as outlined in the APMs BIO-1 through BIO-35, provided above, and that only a very few may require mitigation. Implementation of MM BIO-1a, 1b, and 1c would reduce impacts to wetland-dependent species to less than significant. Implementation of APM BIO-24 would also reduce impacts to vernal pool branchiopods to less than significant.

Option I would result in fewer potential impacts to nesting birds; there are up to 42 potential nesting trees within 100 feet of Option I, and 79 potential nesting trees near the equivalent portion of the proposed Project. Similarly, there are 55 potential nesting trees within 250 feet of Option I, and 109 trees near the equivalent portion of the proposed Project. Implementation of MM BIO-2a and 2b, and BIO-4a and 4d would reduce impacts to tree-dependent species to less than significant.

Impact BIO-4, Habitat Removal or Loss of Special-status Species, discusses potential impacts to the 29 special-status wildlife species that were identified as having a moderate or high likelihood of occurring within the Project study area and being impacted by Project construction (see Table 4.4-3). In addition to implementing APM 1 through APM 35, implementation of MM BIO-4a and 4d would reduce impacts to special-status wildlife species to less than significant.

Option J

Option J would have the potential to result in impacts to special-status wildlife species similar to those of the proposed Project (Class II). Potential impacts related to spills or leaks / health hazard impacts on special-status wildlife species would be less than significant with implementation of APM HAZ-2, APM BIO-5, APM BIO-7, APM BIO-13, APM BIO-14, APM BIO-23, and APM BIO-35

Interference with the movement or range of wildlife species would be a less than significant impact with implementation of APM BIO-1, APM BIO-2, APM BIO-4, APM BIO-5, APM BIO-6, APM BIO-15, APM BIO-16, APM BIO-17, APM BIO-20, APM BIO-21, APM BIO-22, and APM BIO-35.

Several seasonal wetland features are located along Option J, and Option J is within 250 feet of a delineated vernal pool that may provide potential habitat for vernal pool invertebrates. Option J may result in direct impacts to vernal pools that are suitable habitat for special-status vernal pool branchiopods and plant species. However, it is anticipated that a majority of these features would be avoided as outlined in the APMs BIO-1 through BIO-35, provided above, and that only a very few may require mitigation. Implementation of MM BIO-1a, 1b, and 1c would reduce impacts to wetland-dependent species to less than significant. Implementation of APM BIO-24 would also reduce impacts to vernal pool branchiopods to less than significant.

Option J would result in slightly fewer potential impacts to nesting birds; there are up to 77 potential nesting trees within 100 feet of Option J, and 79 potential nesting trees near the equivalent portion of the proposed Project. Similarly, there are 58 potential nesting trees within 250 feet of Option J, and 109 trees near the equivalent portion of the proposed Project. Implementation of MM BIO-2a and 2b, and BIO-4a and 4d would reduce impacts to tree-dependent species to less than significant.

Impact BIO-4, Habitat Removal or Loss of Special-status Species, discusses potential impacts to the 29 special-status wildlife species that were identified as having a moderate or high likelihood of occurring within the Project study area and being impacted by Project construction (see Table 4.4-3). In addition to implementing APM 1 through APM 35, implementation of MM BIO-4a and 4d would reduce impacts to special-status wildlife species to less than significant.

Option K

Option K would have the potential to result in impacts to special-status wildlife species similar to those of the proposed Project (Class II). Potential impacts related to spills or leaks / health hazard impacts on special-status wildlife species would be less than significant with implementation of APM HAZ-2, APM BIO-5, APM BIO-7, APM BIO-13, APM BIO-14, APM BIO-23, and APM BIO-35

Interference with the movement or range of wildlife species would be a less than significant impact with implementation of APM BIO-1, APM BIO-2, APM BIO-4, APM BIO-5, APM BIO-6, APM BIO-15, APM BIO-16, APM BIO-17, APM BIO-20, APM BIO-21, APM BIO-22, and APM BIO-35.

Option K would cross a vernal pool and seasonal wetland features and potentially result in direct impacts to special-status vernal pool branchiopods and plant species. However, it is anticipated that a majority of these features would be avoided as outlined in the APMs BIO-1 through BIO-35, provided above, and that only a very few may require mitigation. Implementation of MM BIO-1a, 1b, and 1c would reduce impacts to wetland-dependent species to less than significant. Implementation of APM BIO-24 would also reduce impacts to vernal pool branchiopods to less than significant.

There are no potential nesting trees located within 250 feet of Option K or the equivalent portion of the proposed Project.

Impact BIO-4, Habitat Removal or Loss of Special-status Species, discusses potential impacts to the 29 special-status wildlife species that were identified as having a moderate or high likelihood of occurring within the Project study area and being impacted by Project construction (see Table 4.4-3). In addition to implementing APM 1 through APM 35, implementation of MM BIO-4a and 4d would reduce impacts to special-status wildlife species to less than significant.

Option L

Option L would result in impacts to special-status wildlife species similar to those of the proposed Project since Option L follows the proposed alignment (Class II). There are no potential nesting trees located within 250 feet of Option L or the equivalent portion of the proposed Project.

Table 4.4-9: Comparison of Alternatives for Special-Status Wildlife Species

Alternative	Comparison with Proposed Project
No Project	No Impacts
Option A	Similar Impacts
Option B	Similar Impacts
Option C	Similar Impacts
Option D	Similar Impacts
Option E	Similar Impacts
Option F	Similar Impacts
Option G	Similar Impacts
Option H	Similar Impacts
Option I	Similar Impacts
Option J	Similar Impacts
Option K	Similar Impacts
Option L	Similar Impacts
Source: Michael Brandman Associates 2009.	

Fisheries

No Project Alternative

The No Project Alternative would result in no impacts compared to the proposed Project. A No Project Alternative would eliminate any potential direct or indirect impacts to fish and their habitat that could result from the crossing of waterways and their adjacent wetlands for the installation of a natural gas pipeline.

Option A

Similar to the proposed Project, Option A would require the crossing of Hungry Hollow Canal, Smith Creek, and various unnamed irrigation canals between its origin at Lines 400 and 401 and its terminus and tie-in point at Line 172A and Line 407. Similar to the proposed Project, these crossings would be conducted using open-cut trenching methodologies. Hungry Hollow Canal, Smith Creek, and the unnamed irrigation canals that would be open-cut trenched as a result of Option A do not support suitable habitat for any special-status fish species due to restricted access and the absence of important habitat suitability elements including riparian cover, in-stream structures, suitable substrate, undercut banks, among other limiting factors.

Based on the similarities and extent of potential impacts, Option A would have no more or no less of an effect on fisheries resources than the proposed Project.

Option B

Similar to the proposed Project, Option B requires the crossing of Hungry Hollow Canal and various unnamed irrigation canals between its origin at Lines 400 and 401 and its terminus and tie-in point immediately east of I-505. Similar to the proposed Project, the crossings of Hungry Hollow Canal and the unnamed irrigation canals would be conducted using open-cut trenching methodologies. Hungry Hollow Canal and the unnamed irrigation canals that would be open-cut trenched as a result of Option B do not support suitable habitat for any special-status fish species due to restricted access and the absence of important habitat suitability elements.

Based on the similarities and extent of potential impacts, Option B would have no more or no less of an effect on fisheries resources than the proposed Project.

Option C

Similar to the proposed Project, Option C requires the crossing of Hungry Hollow Canal at its departure point from the proposed Line 406. Open-cut trenching would be employed for the crossing of this feature in both the proposed Project and Option C. Due to restricted access and the absence of important habitat suitability elements for special-status fish species, Hungry Hollow Canal is not likely to support special-status fish species or their habitat.

Based on the similarities and extent of potential impacts, Option C would have no more or no less of an effect on fisheries resources than the proposed Project.

Option D

Similar to the proposed Project, Option D may include the crossing of a number of unnamed irrigation canals throughout its short reach. The crossings of irrigation canals would be conducted using open-cut trenching methodologies. Due to restricted access and the absence of important habitat suitability elements for special-status fish species, the unnamed irrigation canals are not likely to support special-status fish species or their habitat.

Based on the similarities and extent of potential impacts, Option D would have no more or no less of an effect on fisheries resources than the proposed Project.

Option E

Similar to the proposed Project, Option E may include the crossing of a number of unnamed irrigation canals throughout its short reach. The crossings of irrigation canals would be conducted using open-cut trenching methodologies. Due to restricted access and the absence of important habitat suitability elements for special-status fish species, the unnamed irrigation canals are not likely to support special-status fish species or their habitat.

Based on the similarities and extent of potential impacts, Option E would have no more or no less of an effect on fisheries resources than the proposed Project.

Option F

Similar to the proposed Project, Option F would include the crossing of an unnamed irrigation canal west of the intersection of CR-17 and CR-96. This crossing would be conducted using open-cut trenching. Due to restricted access and the absence of important habitat suitability elements for special-status fish species, the unnamed irrigation canal is not likely to support special-status fish species or their habitat.

Based on the similarities and extent of potential impacts, Option F would have no more or no less of an effect on fisheries resources than the proposed Project.

Option G

The alignment considered for Option G would not involve any crossing of waterways or resources that could support fish species or their habitat. Option G would provide an alternative route for a short reach of the alignment for the proposed Project that also does not involve any crossings of waterways or resources that could support fish species or their habitat.

Based on the determination that neither the proposed Project nor Option G would result in any impacts to fisheries resources, Option G would have no more or no less of an effect on fisheries resources than the proposed Project.

Option H

Option H would increase the distance of the crossing of the Yolo Bypass and would also cross the Tule Canal, Steelhead Creek, and the Sacramento River. The crossing of the Yolo Bypass, the Tule Canal, and the Sacramento River would be conducted using HDD methodologies. The Yolo Bypass, including the Tule Canal, as well as the Sacramento River, were determined to provide suitable habitat for special-status fish species and have a potential to support special-status fish species during all or portions of the year.

Although Option H would also employ HDD methodologies, it would have a greater potential adverse affect on fisheries resources due to the increased distance of the crossing of the Yolo Bypass as compared to the proposed Project.

Option I

Similar to the proposed Project, Option I may include the crossing of a number of unnamed irrigation canals and would cross Steelhead Creek. During wet months, Steelhead Creek has the potential to support special-status fish species, but the unnamed irrigation canals are not likely to support special-status fish species or their habitat.

Based on the similarities and extent of potential impacts, Option I would have no more or no less of an effect on fisheries resources than the proposed Project.

Option J

Similar to the proposed Project, Option J may include the crossing of a number of unnamed irrigation canals and would cross Steelhead Creek. During wet months, Steelhead Creek has the potential to support special-status fish species, but the unnamed irrigation canals are not likely to support special-status fish species or their habitat.

Based on the similarities and extent of potential impacts, Option I would have no more or no less of an effect on fisheries resources than the proposed Project.

Option K

The alignment considered for Option K would not involve any crossing of waterways or resources that could support fish species or their habitat. Option K would provide an alternative route for a short reach of the alignment for the proposed Project that also does not involve any crossings of waterways or resources that could support fish species or their habitat.

Based on the determination that neither the proposed Project nor Option K would result in any impacts to fisheries resources, Option K would have no more or no less of an effect on fisheries resources than the proposed Project.

Option L

The alignment considered for Option L would not involve any crossing of waterways or resources that could support fish species or their habitat. Option L would provide an alternative route for a short reach of the alignment for the proposed Project that also does not involve any crossings of waterways or resources that could support fish species or their habitat.

Based on the determination that neither the proposed Project nor Option L would result in any impacts to fisheries resources, Option L would have no more or no less of an effect on fisheries resources than the proposed Project.

Table 4.4-10: Comparison of Alternatives for Special-Status Fish Species

Alternative	Comparison with Proposed Project
No Project	No Impacts
Option A	Similar Impacts
Option B	Similar Impacts
Option C	Similar Impacts
Option D	Similar Impacts
Option E	Similar Impacts
Option F	Similar Impacts
Option G	Similar Impacts
Option H	Similar Impacts
Option I	Similar Impacts
Option J	Similar Impacts
Option K	Similar Impacts
Option L	Similar Impacts
Source: Michael Brandman Associates 2009.	

4.4.6 Cumulative Projects Impact Analysis

Vegetation Communities and Wildlife Habitats

Construction of the proposed Project would not result in long-term impacts to vegetation communities and wildlife habitats. The temporary impact to annual grasslands, irrigated row and field crops, and developed/disturbed areas is considered less than significant based on the abundance of these vegetation communities in the Project vicinity. Construction of the aboveground facilities would permanently convert 1.19 acres of annual grassland/ruderal, 0.36 acre of irrigated row and field crop, 0.62 acre of rice, and 0.01 acre of developed/disturbed area. Impacts to rice fields, which are federally jurisdictional features, are discussed below. Given the scale of other projects in the Cumulative Projects Study Area, the proposed Project impacts to upland vegetation communities would be negligible. Therefore, the proposed Project would not contribute to a cumulatively significant impact when viewed in conjunction with other projects identified within the Cumulative Projects Study Area.

Waters of the U.S., Including Wetlands

Of the 796.97 acres of federally jurisdictional wetlands and other waters of the U.S. that occur within the Project study area, up to 65.95 acres (2.17 acres of other waters of the U.S., and 63.55 acres of wetlands) would potentially be disturbed due to construction of the proposed Project. Specifically, up to 0.04 acre of NRPW, 1.55 acres of RPW, 0.58 acre of TNW (Sacramento River), 0.1 acre of fresh emergent wetland, 0.79 acre of riparian wetland, 0.71 acre of seasonal swale, 6.52 acres of seasonal wetland, 0.1 acre of vernal pool, 0.04 acre of willow riparian, and 55.28 acres of rice would be disturbed.

The majority of the vernal pool features within the Project site would be avoided using HDD methodology (see Table 2-5) and as outlined in APMs BIO-1 through BIO-35 and MM BIO-1 (a, b, and c), provided above. There are several proposed Projects within the Cumulative Projects Study Area that would impact vernal pool habitats. The largest of these is the Placer Vineyards Specific Area Plan, which contains approximately 2,000 acres of vernal pool habitat. All other projects identified in Cumulative Projects Study Area also have the potential to impact seasonal wetlands and/or vernal pools. However, this Project's contribution is less than cumulatively considerable and, therefore, less than significant because the Project would impact very few vernal pools and the Project would implement its fair share of mitigation measures designed to alleviate the cumulative impact (CEQA Guidelines section 15130(a)).

The proposed Project would result in permanent impacts to 0.62 acre of rice field and temporary impacts to fresh emergent wetlands, riparian wetlands, seasonal swales, seasonal wetlands, willow riparian, rice, and numerous other waters of the U.S. The Project would result in few long-term impacts to federally jurisdictional wetlands and other waters of the U.S. Implementation of APMs BIO-1 through APM BIO-35 and MM BIO-1 (a, b, and c) would minimize or compensate for impacts to these features and prevent temporary and permanent alteration or loss of habitat function. Given the scale of other projects in the Cumulative Projects Study Area, the proposed Project impacts to these habitats are considered less than cumulatively considerable and are not significant.

Special-Status Plant Species

Construction of the proposed Project would not result in any impacts to special-status plant species. Therefore, the proposed Project would not contribute to a cumulatively significant impact when viewed in conjunction with other projects identified within the Cumulative Projects Study Area.

Special-Status Wildlife Species

The proposed Project may result in direct impacts to vernal pools that are suitable habitat for special-status vernal pool branchiopods. The majority of the potential impacts to vernal pools would be temporary in nature due to the on-site restoration of the wetlands, and implementation of APM BIO-1 through APM BIO-35 and MM BIO-1 (a, b, and c), provided above, would reduce impacts to these species to less than significant. There are several proposed projects within the Cumulative Projects Study Area that would impact vernal pool habitats. The largest of these is the Placer Vineyards Specific Area Plan, which contains approximately 2,000 acres of vernal pool habitat. All other projects identified in the Cumulative Projects Study Area also have the potential to impact vernal pools. However, this Project's contribution is less than cumulatively considerable and, therefore, less than significant because the Project would impact very few vernal pools and the Project would implement its fair share of mitigation measures designed to alleviate the cumulative impact (CEQA Guidelines section 15130(a)).

The proposed Project may result in indirect impacts to elderberry shrubs that may support valley elderberry longhorn beetle. Although 23 elderberry shrubs are located within 100 feet of the Project site, and multiple exit holes were observed on several of these shrubs, none of these shrubs are located within 20 feet of the Project site and none would require removal. Implementation of MM BIO-4 would reduce these impacts to a less-than-significant level. There are several other proposed projects within the Cumulative Projects Study Area that are likely to directly and indirectly impact valley elderberry longhorn beetle. Given the scale of the other projects in the Cumulative Projects Study Area, the potential for indirect impacts to elderberry shrubs that may support the valley elderberry longhorn beetle is cumulatively not significant.

The proposed Project may result in direct and indirect impacts to Swainson's hawk nesting habitat. Based on conservative estimates made using recent aerial photography (NAIP 2005), approximately 206 potentially suitable nesting trees would be removed during construction of the proposed Project, and an additional 1,967 potentially suitable nesting trees occur within 250 feet of the Project site, some of which may require removal or trimming/pruning in order to construct the project. Several of these trees have recorded occurrences of nesting by Swainson's hawk. Although mitigation measures prescribed under Impact BIO-4 would reduce these impacts to a less-than-significant level, there are several other proposed projects within the Cumulative Projects Study Area that likely would also impact foraging and nesting habitat of Swainson's hawk. These impacts are cumulatively considerable.

The Project would traverse areas designated as Mitigation Lands by the Natomas Basin Conservancy, and implementation of MM BIO-4b is required to reduce impacts to less than significant. The Natomas Levee Improvement Plan is also occurring within or adjacent to lands designated as Mitigation Lands. None of the other cumulative projects that occur within the Natomas Basin Habitat Conservation Plan Area would occur within the boundaries of the NBHCP.

The proposed Project has the potential to result in impacts to western burrowing owl and numerous other bird species, three bat species, and American badger. Implementation of APM BIO-1 through APM BIO-35, MM BIO-1 (a, b, and c), MM BIO-2 (a, b), and MM BIO-4 (a, b, c, d) would reduce impacts to less than significant. There are several other proposed projects within the Cumulative Projects Study Area that likely would also impact these special-status species. However, given the scale of other projects in the Cumulative Projects Study Area and the fact that the proposed Project would not result in long-term, permanent impacts to these species, impacts are considered less than cumulatively considerable and are not significant.

Fisheries

Construction of the proposed Project would not result in any impacts to fisheries. All waterways that support the required habitat elements for the movement, range, or spawning of special-status resident or anadromous fish would be crossed using HDD methodologies, and no impacts are anticipated to result from the open-cut trenching of waterways. Therefore, the proposed Project would not contribute to a cumulatively significant impact when viewed in conjunction with other projects identified within the Cumulative Projects Study Area.

4.4.7 Summary of Impacts and Mitigation Measures

Table 4.4-11: Summary of Biological Resources Impacts and Mitigation Measures

Impact	Mitigation Measure
BIO-1. Wetlands.	**BIO-1a.** Wetland Avoidance and Restoration. **BIO-1b.** Trench Backfill and Topographic Restoration. **BIO-1c.** Riparian Avoidance and Restoration.
BIO-2. Reduce or alter vegetation.	**BIO-2a.** Tree Avoidance and Replacement. **BIO-2b.** Avoidance of Valley Oak Woodland.
BIO-3. Invasive Species or Soil Pests.	**BIO-3a.** Prepare and Implement an Invasive Species Control Program.
BIO-4. Habitat Removal or Loss of Special-status Species.	**BIO-4a.** Protect Special-status Wildlife. **BIO-4b.** Mitigation for potential impacts to Natomas Basin Conservancy Mitigation Lands. **BIO-4c.** Mitigation for potential impacts to Sacramento River Ranch Conservation Bank mitigation lands. **BIO-4d.** Protect Special-status Bird Species.
BIO-5. Construction Impacts on Special-status Plant Species.	**BIO-5a.** Rare Plant Avoidance.
Source: Michael Brandman Associates 2009.	

4.5 CULTURAL RESOURCES

This Section presents a summary of the findings of numerous cultural resource studies; a paleontological survey, and a historic architectural survey conducted for the proposed PG&E 406/407 Natural Gas Pipeline Project (Project). Each study analyzes potential impacts to known and undocumented resources from construction and operation of the Project. The four resulting reports are combined in this Section to present a cumulative report that addresses potential impacts from Project development.

Cultural Resource Studies

Three separate cultural resources studies were conducted for the Project; the first was conducted by Garcia and Associates (see Appendix F-1) and included Line 406 from the western edge of the Project to a terminus near County Road (CR) 98 in Yolo County. The second study was conducted by Far Western Anthropological Research Group (see Appendix F-2) and included Line 407 from approximately CR-98 in Yolo County to the eastern terminus near the City of Roseville. In addition, a pedestrian survey was undertaken on March 24, 2009, on a short realignment segment of Line 406 west of the town of Yolo, in Yolo County (see Appendix F-3). The paleontological study included both Line 406 and Line 407 and was conducted by Garcia and Associates and reviewed by Dr. Kenneth L. Finger (See Appendix F-4). The historic architectural survey was conducted for the Project by Galvin Preservation Associates (GPA) (see Appendix F-5). Finally, Far Western Anthropological Research Group, Inc. (Far Western) conducted an additional cultural resources study for the Center Joint Unified School District alternative options along Line 407 (see Appendix F-6).

Methodology

The methods used for each of the cultural studies consisted of archival record searches, Native American consultations, field inventories, and preparation of technical reports.

Record Searches

Records searches were carried out at the Northwest Information Center (Sonoma State University), the North Central Information Center (California State University, Sacramento), and the Northeast Information Center (California State University, Chico) of the California Historical Resources Information System, an adjunct of the State Office of Historic Preservation. The records search for Line 406 took place in

November 2005; those for Line 407 occurred in June and July 2006, in January and April 2007, and in January 2009. It should be noted that the realignment segment that was surveyed in March 2009 was included in the original record search radius and therefore an additional record search was not required for the realignment segment. They included a review of the following documents:

- Site records and reports of previous studies in or adjacent to the Project corridor;
- California Inventory of Historical Resources (Department of Parks and Recreation 1976);
- California Office of Historic Preservation's Five Views: An Ethnic Historic Site Survey for California (Department of Parks and Recreation 1988);
- California Points of Historical Interest (Department of Parks and Recreation 1992);
- Historic Properties Directory Listing by City (Department of Parks and Recreation 2003);
- Directory of Properties in the Historical Property Data File, Archaeological Determinations of Eligibility, National Register of Historic Places - Listed Properties and Determined Eligible Properties;
- California Register of Historical Resources; and
- Historic-era 7.5- and 15-minute U.S. Geological Survey (USGS) quadrangles and General Land Office (GLO) plat maps.

Native American Consultations

In July 2006 and January and May 2007 (Line 407), and in March 2007 (Line 406), letters were sent to the Native American Heritage Commission (NAHC) to request a review of their Sacred Lands Inventory and a list of local Native American groups and individuals with particular interest in the Project.

The response from the NAHC contained a list of 16 groups/individuals that were interested in the Project. Letters and Project maps were sent to the 16 groups/individuals requesting additional information or concerns they may have about the Project. To ensure that all of the 16 groups/individuals concerns were met, follow-up phone calls were made. Four written responses were received and a field review took place with two additional individuals, at their request. None of the respondents had specific knowledge of prehistoric sites within the Project, though all six expressed concerns about protection of any Native American sites that may be present in the vicinity of the Project. All of the Native Americans asked to be informed about any Project modifications or changes and the results of the cultural resource studies. The current project description and map, and a letter eliciting concerns and issues, were mailed to the suggested contacts for Placer County on January 16, 2009. Follow-up phone calls were made on January 23, 2009. No comments were received.

Field Surveys

Fieldwork for the cultural resources study took place in separate phases, as follows: Garcia and Associates conducted a survey for the Line 406 Project in December 2006 and February 2007; Far Western surveyed Line 407 East in July and September 2006 and in June 2007, Line 407 West in May 2007, and Line 407 alternative options in January 2009; and the historic architectural survey was conducted by GPA for the Project in June and August 2008. Additionally, a pedestrian survey was undertaken by Far Western on a short realignment segment of Line 406 west of the town of Yolo in Yolo County. The short realignment section (approximately 675 meters) was surveyed on March 24th, 2009 in two transects spaced 10 meters apart for a total areal coverage of approximately five acres. All of the field surveys were conducted by qualified archaeologists meeting the Secretary of the Interior's Standards. Any previously documented cultural resources within or immediately adjacent to the Area of Potential Effects (APE) were revisited during the surveys to confirm their locations and assess their present status. In some cases, the sites had been destroyed by modern development; in other instances, they were found not to extend into the Project area. Existing site records were updated, as necessary. Ten new site records were created for ten buildings recorded during the architectural survey.

4.5.1 Environmental Setting

Cultural Setting

Regional Setting

The following discussion includes a brief summary of the prehistory of the region; brief overviews of the ethnography and ethnohistory of Native Americans who lived in the general vicinity of Line 406 and Line 407 before the arrival of non-native explorers, settlers, and miners; and overviews of local history. This brief background summary is provided as a context within which to consider the potential significance of cultural resources in the Project area. While some of the archaeological and historical resources described in this Section are not in the Project APE, they are included here to help develop this context.

Native American History

Early Period

The archaeological sequence of the lower Sacramento Valley begins approximately 5,000 years ago with the Early Period (circa [ca.] 5000 to 2500 years Before Present [BP]). Although it is possible that people lived in the region at an earlier time, there is scant evidence pointing to an earlier occupation. It is believed that the archaeological record of their settlements is buried under recent Holocene alluvium. The Early Period is represented in the Sacramento Valley by the Windmiller Pattern, which has been identified but scantily documented in the immediate Project vicinity. Six miles south of the Project corridor, Early Period artifacts consisting of charmstones were found with possible human remains at archaeological site SAC-422. Windmiller Pattern burials and artifacts are also reported from SAC-164 located a short distance north of Sacramento. Early Period site COL-247 north of Colusa contained artifacts very similar to Windmiller sites in the lower Mokelumne and Cosumnes River drainages, such as Olivella thick rectangle beads and stemmed dart points, but it is most notable for a well-developed baked clay industry that included small vessels and impressions of acorns and human fingerprints. Site COL-247 included a wide range of faunal remains, including a variety of fish, as well as a robust assemblage of charred plant remains with abundant acorn and other nutshell, many small seeds, and a relatively high frequency of root crops.

Middle Period

Archaeological remains dating to the Middle Period (ca. 2500 to 1000 BP), or the Berkeley Pattern, are much more common and thus this period is better understood than the previous one. Middle Period populations were apparently large, judging by large settlements along the river in Sacramento, exemplified by the 1994 analysis of materials from site SAC-43. This study was the first ever done on a lower-Sacramento Valley mound site using modern analytical techniques (radiocarbon dating, obsidian-hydration dating, stable-isotope analysis, faunal analysis, and examination of plant macrofossils). The researchers determined that SAC-43 had been a year-round, residential base occupied from about 2400 to 600 BP, with an artifact assemblage that included many projectile points, modified-bone and antler tools, as well as shell beads and ornaments. They also concluded that the data from SAC-43 called into question the extant cultural-historical system, as well as essentially all chronological data associated with the central California record.

Middle/Late Transition Period

The Middle/Late Transition Period (1000 to 800 BP) is known from an important but undocumented excavation just north of the Project area, near the confluence of the Sacramento and Feather rivers at site YOL-13, the Mustang Site. Many human burials and grave offerings have been found at this location; however, little could be determined about subsistence data or residues of everyday life, as a midden deposit (refuse deposit resulting from human activities) was not associated with the human remains. The study findings have never been published, and very little is known about this transitional period in local prehistory.

Late Period

The Late Period (800 to 150 BP), also referred to as the Augustine Pattern, is well documented along the Sacramento River and lower Cache and Putah creeks. Late components have been described from SAC-29 and SAC-164 in Sacramento, and abundant human remains, artifacts, and ecofacts reflect large human populations. Sites from this period contain abundant clamshell (*Saxidomus*) disk beads, Olivella shell beads, and small arrow points; and some of the latest sites have contained glass trade beads as well. Fish, artiodactyl bone, charred acorn nutshells, and small seeds from Late Period middens provide information on dietary patterns and the natural environment at the end of the prehistoric period in the lower Sacramento Valley.

The Historic-contact Period, after 150 BP (earlier in some areas), marked the end of traditional Native California, as non-native missionaries, trappers, explorers, miners, and settlers occupied their lands and disrupted their ways of life. The following ethnographic overview describes the lives of local Native Americans as observed by these newcomers.

<u>Ethnography</u>

Ethnographic Period Native Californians were complex hunter-gatherers whose primary sources of food were fish, game (deer, elk, etc.), and wild plants (particularly acorns). The Project area east of the Sacramento River was in the traditional territory of the Nisenan, which extended from the South Fork of the Feather River south to the Middle Fork of the Cosumnes River, and from the Sacramento River east to the Sierran crest. The corridor west of the Sacramento River runs through the former range of the Patwin, who controlled the lowland valleys from Colusa south and west to Vacaville and Napa.

In the rich environment of the Sacramento Valley, both the Nisenan and Patwin lived in more or less permanent villages concentrated along the major rivers and larger creeks. Villages consisted of a cluster of semi-subterranean houses occupied by one or more families, and ranged in size from small hamlets of 25 to 30 residents to large towns up to 500 or 1,000 people. Nisenan villages known to be within the Project vicinity include the communities of Leuchi and Wishuna east of the Sacramento River, and Nawe west of the Sacramento River south of Verona. Nearby Patwin villages include Yo'doi at Knights Landing, and Churup at the City of Yolo. Available information suggests that although the population density of this area was high, people were not concentrated in a single large community but were dispersed in several smaller, probably kin-based villages along the Sacramento River and its major tributaries.

The indigenous lifeways of Nisenan and Patwin society were irrevocably changed with the arrival of Euro-Americans in California. Spanish expeditions in 1808 and 1821 were the first incursions into the Sacramento Valley, and each briefly passed through the Project area. Patwin people from the Winters area were first baptized at Franciscan missions in the Bay Area between 1825 and 1829, and again between 1830 and 1832. The first Patwin from lower Cache Creek were baptized at Mission Sonoma in 1834. As early as the late 1820s, and in numbers by the 1830s, Euro-American trappers operated throughout the Central Valley. The trappers brought numerous diseases, and in 1833 the Native American population was decimated by a pandemic thought to have been malaria. Additionally, at about this time, Mexico had won its independence from Spain and was instituting new administrative policies in Alta California. Many new land grants were given to private citizens for enormous ranchos and, like the missionaries, the ranchers sought their labor supply in the Native American villages. Most of the native people who survived this onslaught did so by adapting to the new economy and working for the ranchos. Today their descendants live in small communities throughout the lower Sacramento Valley and the Sierra Nevada foothills.

Euro-American History

Historic-era land use and development in the Project area have been characterized primarily by agriculture, reclamation Projects, and transportation. The earliest sustained Euro-American use of the general Project vicinity was in the late 1840s, when individuals like Johann Sutter established ranches and farms, using local Native Americans as a labor force. By 1851, the region was sparsely settled and mining was in full swing along many streams crossing the lower Sierra Nevada foothills to the east. Miners traveling through the area between Marysville and Sacramento developed a trail that crossed the Project area, although no signs of it remain today. By 1854, much of the Project corridor contained small-scale ranches and homesteads.

Agriculture and Reclamation

A large portion of the Project area was formerly swampy overflow land and remained undeveloped until the large land reclamation projects of the early 20th century. In 1855, the Reclamation District Act allowed an individual to buy up to 320 acres of swamp and overflow lands at $1 per acre with payments over five years, effectively transferring control of reclaimed lands from the State of California and the counties to the landowners. By 1891, swamp and overflow land reclamation was thriving and led to the establishment of farms and orchards, especially around the population centers of Woodland, Knights Landing, Winters, and Capay Valley.

After a destructive flood in 1907, the California legislature established flood control for the area by raising the natural levees along the Sacramento River; they created Reclamation District (RD) 1000 in 1911. Reclamation District 1000 was the first and largest of the reclamation districts and the most visible, given its proximity to the State capitol. The RD 1000 was determined eligible for listing on the National Register because of the vital role it played in the 20th-century development of lower Sacramento Valley agriculture and the expansion of towns like Sacramento and Woodland. The current Project corridor crosses through the northern end of RD 1000 and could impact some of its National Register contributing features.

An 1857 GLO Plat map of eastern Yolo County shows very little development other than two residences, the “St. Louis House” and “Greenwoods.” Although there is no historical record for these houses, they were probably small refreshment stations for travelers on the road from Woodland. The location of Greenwoods may coincide with one of the historic-era structures recorded for the current study (Site 4). The St. Louis House appears to have been related to Charles and Frederick St. Louis, two brothers from Canada who immigrated to California and settled in Yolo County in the early 1850s. The St. Louis family owned land in the Project area as late as 1926.

Owing to the frequent flooding of Cache Creek and the Sacramento River, most historic-period communities in Yolo County were located on high ground. For instance, the original county seat in Washington (now West Sacramento) was moved to the fledgling community of Woodland in 1862 after a major flood. The small town of Yolo started as a way stop known as Cochran's Crossing built in 1849 by Thomas Cochran. James Hutton built another hotel at the same location a few years later, and the site became known as Hutton's Ranch or Travelers' Home, and later Cacheville. An 1891 history of Yolo County states, "The County seat was removed to Cacheville [in 1857], which had formerly been called Hutton's Ranch, the post-office being called Yolo" (Gudde 1969; Lewis Publication Company 1891; Yolo County 2007). In 1862, Yolo City became Woodland and was established as the county seat. Historic maps from the 1879 DePue history of Yolo County (Gilbert 1879) clearly indicate that Cacheville is the present-day town of Yolo, and was probably the early county seat and post office before flooding and the railroad led to Woodland becoming the prominent center. Many of the buildings still standing along the small commercial area in present-day Yolo clearly date to the 19th century.

Ranches began to appear around Yolo during the 1850s, largely devoted to wheat farming. The area looked much as it does today, mainly agricultural fields with isolated farmhouses. Two homes in the Project vicinity date to this period: the Lewis Cramer house (within the Project APE) and the John Laugenour house (outside the Project APE). James Eustis built a house just east of the Cramer residence during the late 1880s or early 1890s. The Cramer House has been recommended as eligible for listing on the National Register of Historic Places (NRHP).

Historically, throughout the Project area, property owners drilled private wells for their water needs and built private canals as necessary to bring purchased water from the main canals to their farms. Many of these water-supply features exist today within the Project vicinity.

The eastern third of the Yolo County portion of the Project area lies within private reclamation districts, the largest of which is the RD 1600. Established in 1913 by local farmers who pooled their tax assessments to create their own drainage system, RD 1600 is bounded by the Sacramento River on the north and east, the Tule Canal on the west, and another private reclamation district on the south. Other local districts include the Sacramento San Joaquin Drainage District, with RD 819 adjacent to the west and RD 820 on the south.

Knights Landing Ridge Cut was added to the reclamation efforts in 1915 as part of the Yolo Bypass flood control project. The cut takes drainage water from the Colusa Basin to the west through Knights Landing Ridge to the Yolo Bypass, one of two main bypass systems in the Sacramento Valley that carries excess floodwaters from the Sacramento River to relieve strain on its levees (Les 1986). Today, the western Project area remains largely rural and less affected by the population growth following World War II than most towns and small cities. Growth in the Project area was limited to single-family homes located in clusters along major roads.

Farming continues to be the major growth factor with a slow but steady increase in residential structures largely associated with agricultural production. These consist primarily of additional home sites for growing families and ranch employees, as well as some parcel subdivisions for houses independent of actual farming operations. Historic-period maps indicate these homes were constructed throughout the 19th and 20th centuries. The Project area has escaped the post-World War II subdivision development phase that occurred elsewhere throughout California, remaining largely in rural agricultural use (GLO 1857b; USGS maps 1915 and 1941).

Transportation

Transportation developments, primarily the railroads, contributed much to the established settlements in the Project vicinity. In 1869, the California Central Railroad Company constructed railroads from Davisville (now Davis) to Woodland and from there to Marysville (Marysville Branch Line) via Knights Landing. Portions of this line were reconstructed after flooding in 1871 and in 1890. The line was later subsumed by the Southern Pacific Railroad and Union Pacific Railroad companies.

Several historic-era roads also cross the Project area, but their character has been greatly altered by continued maintenance, reconstruction, and use. Riego Road, for example, was constructed as part of the Natomas Company's original network of roads for the RD 1000 area, along with numerous subdivisions of land that were sold to potential farmers. The Sacramento Northern, an inter-urban electric railroad, also took advantage of the newly protected area and constructed an important transportation link between Sacramento and towns to the north, including Marysville and Woodland. This alignment was constructed ca. 1913 and actually became the eastern boundary of RD 1000. The Sacramento Northern railroad carried both passengers and freight until it was replaced by cars and trucks after World War II. The various railroads also played a role in increasing the population centers along their route; those closest to the Project area included Rio Linda and Elverta. These small communities were able to grow as the railroads connected them to larger urban areas such as Sacramento.

Nonetheless, the Project area has remained primarily rural. Today the segment of the railroad within the Project area is abandoned. During the 1980s, road widening on State Route (SR) 99 resulted in substantial changes to the East Drainage Canal and Riego Road (both features of RD 1000). The Canal was reconstructed with concrete water diversion structures and a 300-foot-long culvert box under SR-99, and Riego Road was widened at its intersection with SR-99.

Known or Potential Cultural Resources within the Project Corridor

Line 406 Study Area Record Search and Field Survey Results

Record Search Results

Of the 54 known or possible cultural resources identified by the record searches conducted for the Line 406 study corridor, only two were determined to be within the survey area: the John Ritchie house and outbuildings (YOL-HRI-4/106), and the Herman Richter house and outbuildings (YOL-HRI-4/114). The 54 resources included 25 historic-era resources listed on the California State Historic Resources Inventory; 20 archaeological sites of historic and prehistoric age; and nine other historic-era resources, which only had primary site numbers. Other resources included “Demerleys Field” and eight short, unrecorded road segments noted on GLO plat maps.

An investigation of ten GLO maps dated from 1851 to 1869 did not indicate any potential historic buildings or structures within the survey area, except for eight short, unrecorded road segments crossing present-day CR-17 from USGS map Sections 1 to 3 in Township 10 North, Range 1 East. It is clear, however, that as early as 1858 the general area was occupied and used for agricultural purposes. Demerleys Field, identified in an 1864 GLO map (NW quarter of Section 3, Township 10 North, Range 1 East) is within the Line 406 pipeline alignment. Canals emanating from Cache Creek were not present, but several fields were adjacent to Cache Creek.

The survey area for this study passes through two land grants: Cañada de Capay and Rio Jesus Maria. The 40,079-acre land grant Cañada de Capay was confirmed to Jasper O'Farrell et al. on February 16, 1865, and the Rio Jesus Maria land grant (26,637 acres) to J. M. Harbin et al. on July 3, 1858.

In addition to the records search for the previously-identified resources, Garcia and Associates and Far Western conducted general and building specific contextual research in both 2006 and 2007 for the Project area in order to identify significant local historic events and personages, development patterns and unique interpretations of architectural styles. GPA expanded on this research in September 2008. GPA gathered historic information from the following locations:

- California History Room, California State Library (900 N Street, Room 200; Sacramento, CA 95814);
- Yolo County Archives (226 Buckeye Street; Woodland, CA 95695);
- Yolo County Assessor's Office (625 Court Street, Room 104; Woodland, CA 95695);
- Yolo County Historical Museum (512 Gibson Road; Woodland, CA 95695);
- Yolo County Historical Society (P.O. Box 1447; Woodland, CA 95776); and
- Yolo County Planning & Public Works (292 W. Beamer Street; Woodland, CA 95695).

Public Consulting

Public consulting letters and maps were sent by GPA to the following historical organizations and agencies on September 11, 2008:

Table 4.5-1: Public Consultation Mailing List

Placer County	
Placer County Genealogical Society Attn: Director P.O. Box 7385 Auburn, CA 95604	Placer County Historical Society Attn: Director P.O. Box 5643 Auburn, CA 95604
Placer County Planning Department Attn: Michael Johnson, Planning Director 3091 County Center Drive Auburn, CA 95603	Rocklin Historical Society Attn: Director P.O. Box 752 Rocklin, CA 95677

Sacramento County	
The California Museum for History, Women and the Arts Attn: Claudia French, Executive Director 1020 O Street Sacramento, CA 95814	Planning & Community Development Dept. County of Sacramento 827 7th Street, Room 230 Sacramento, CA 95814
Sacramento Historical Society Attn: Director P.O. Box 160065 Sacramento, CA 95816-0065	West Sacramento Historical Society Attn: Director 324 Third Street West Sacramento, CA 95691
Sutter County	
Community Memorial Museum of Sutter County Attn: Julie Stark 1333 Butte House Road Yuba City, CA 95993	Sutter County Historical Society Attn: Phyllis Smith P.O. Box 1004 Yuba City, CA 95993
Sutter County Planning Department Attn: Danielle Stylos, Division Chief 1130 Civic Center Blvd. Yuba City, CA 95993	
Yolo County	
Yolo County Historical Museum Gibson House Attn: Barbara Shreve, Director 512 Gibson Road Woodland, CA 95695	Yolo County Archives 226 Buckeye Street Woodland, CA 95695
Yolo County Historical Society Attn: B.J. Ford, Director P.O. Box 1447 Woodland, CA 95776	Yolo County Planning & Public Works Attn: John Bencomo, Director 292 West Beamer Street Woodland, CA 95695
Heidrick Ag History Center Attn: Colleen Thompson 1962 Hays Lane Woodland, CA 95776	
Source: Galvin Preservation Associates 2008.	

As of the date of this report, no responses have been received regarding this Project or any historic resources associated with it.

Field Survey Results

The field survey conducted for the Line 406 study corridor identified two previously recorded historic-period resources, six newly recorded historic-period resources, and an isolated prehistoric chert tool (Garcia and Associates 2006).

The **John Ritchie House (YOL-HRI-4/106)** is a two-story vernacular house of no particular style estimated to have been built in 1860. Several small outbuildings are also on the property, and include a barn, a smokehouse, and small bunkhouses.

The **Herman Richter House (YOL-HRI-4/114)**, built in 1929, is a large two-story Mediterranean Revival style house constructed of brick. Several redwood buildings e.g., a smokehouse, granary, barn, and several sheds are located within the study area. A single-story house (13460 CR-97F), built in the 1860s, is part of the same property.

The proposed Line 406 alignment also crosses two linear irrigation conveyances, the Goodnow Slough and the Hungry Hollow Canal.

The **Goodnow Slough (Y-3)** is an extensive earthen-walled irrigation canal that passes through the survey area at two locations on the eastern side of Interstate (I) 505 and crosses the path of the proposed pipeline. Several smaller irrigation ditches feed in and out of the slough. The construction date for the slough is not clearly established, but the slough is depicted on a map in a 1967 report titled “A Reconnaissance Study to Investigate the Feasibility of the Hungry Hollow Watershed Project” by the State of California Division of Soil Conservation.

The **Hungry Hollow Canal (Y-9)** is a long, wide, earthen-walled canal that enters the southeast portion of the survey area. The water in this canal originates from Cache Creek and passes through Capay Dam and West Adams Canal before entering into Hungry Hollow Canal. It is assumed that the Canal was built before ca. 1914, which is the construction date of Hungry Hollow Bridge that crosses a branch of Hungry Hollow Creek.

Site Y-6 is an historic-era dumpsite located in a dry, shallow gulch. A windmill-powered water pump, trough, and four trees are about 300 feet to the west, and may at one time have been associated with the dumpsite. Artifacts were found eroding out of the sidewalls of the gulch. The majority of the artifacts appear to be household and agricultural items, such as fragments of plates, concrete chunks, iron sheet metal, and window and bottle glass.

Site Y-7 contains a historic era residence and three farm buildings. According to the current owner, the farm buildings consist of a granary built in 1881 and two barns built in the 1940s. It was later discovered that the residence, which appeared relatively new because of extensive renovations conducted the previous year, was actually constructed in 1927.

Site Y-17 is an isolated prehistoric tool, either a uniface or a retouched flake, made of Franciscan chert. It was found in the middle of a plowed field, not far from two farm complexes. It is predominantly brown in color with white lines and green portions. The artifact was flagged but not collected.

Site Y-20 is an historic-era residence and associated barn which are over 50 years old. The current property owner did not know the exact dates of construction for the buildings. There is a long prickly pear cactus hedge adjacent to a wooden fence in front of the residence; this hedge is part of the residential landscape and appears to be more than 50 years old.

Site Y-21 is a segment of the historic alignment of the former Northern Railway Company; it is now part of the Southern Pacific Railroad and is actively in use. Railroad construction was started in 1875 and was completed sometime before 1879, as depicted in the Yolo County atlas (Yolo County 1879).

No prehistoric resources were discovered during the March 24, 2009, Line 406 pedestrian survey. A working irrigation ditch was recorded, but it is unclear whether this ditch is historic or modern in age. The ditch was noted on an aerial and if historical research (which is planned as part of upcoming survey of the Line 406 alternative routes) determines that the irrigation ditch is historic, then a Department of Parks and Recreation (DPR) Primary Record form will be completed and submitted to the Northwest Information Center at Sonoma State University.

Line 407 Study Area Record Search and Field Survey Results

<u>Record Search Results</u>

The record searches for the Line 407 study area and a 0.25-mile-wide buffer on each side of the proposed centerline identified 122 documented or potential cultural resources, of which 103 appeared to be within or immediately adjacent to the survey corridor. Many of these were known only from review of old GLO plat maps or topographic maps, and had never been confirmed on the ground.

During the course of the field survey for the Line 407 corridor, 73 cultural resources were found within the study area. Forty-nine resources that were plotted on historical maps were not relocated during the field survey. It is likely that many of the resources either were outside the survey corridor or have been destroyed by subsequent land use and development.

Field Survey Results

The 73 resources confirmed within the Line 407 study corridor include 24 features of the RD 1000 Rural Historic Landscape, 47 other historic-era structures or features, one prehistoric occupation site, and an isolated prehistoric biface (Far Western 2008). Each is briefly described below, from west to east. Certain types of features are described as single categories; for example, water wells.

Site EW-1/H is an extensive prehistoric archaeological site with a small historic-period component within the Line 407 study area. As currently recorded, the site extends approximately 0.75-mile east-west, and an unknown distance north and south of the surveyed 600-foot-wide survey corridor. The prehistoric site component is a dispersed scatter of fire-altered rock, flaked stone debris, and flaked and ground stone artifacts, scattered across roughly 42 acres on several adjacent fields. It is assumed that much of the deposit may be subsurface. It is possible that this site is YOL-35, which was recorded by D. Gallup in the 1930s or 1940s. The historic-period component is an old agricultural well and two concrete drains.

Site 33 includes two houses, two garages, a carport, a privy, seven sheds, two corrals, a windmill, three wells, a greenhouse, and a chicken coop on a 10-acre parcel. The main house appears to have been built ca. 1900, probably for James Scarlett, a local farmer. The other house was constructed ca. 1930.

Site 32 is a single-story residence with a ranch-style appearance, but it may reflect an adaptation of an earlier house. A structure is depicted at this location on a 1941 USGS map, and the core of the house (a simple, rectangular gable-roof structure) may date to this early period. The house was extensively modified after 1960 and expanded to its current ranch-style appearance.

Site 31 is a single-family residence, a barn, and various sheds built ca. 1910. The original appearance of the house has been altered by additions, window replacements, and exterior fabric modifications.

Site P-57-000405 (Cramer House) is a two-story Victorian Italianate house built ca. 1870 by Lewis Cramer. Three associated outbuildings also appear to be from the same historic period and are contemporary to the house.

Site P-57-000406 is a substantial two-story house dating to the early 1900s. The house sits on a stone foundation, and is rectangular in plan with symmetrical massing. There are two historic-period additions, one each on the east and west sides of the house. Several modern barns and a garage have been built east of the house.

Site P-57-000407 is a one-story cottage with a modern detached garage and barn. The house sits on a brick foundation with an irregular plan. Windows are historic-period one-over-one double-hung wood sash, in pairs and singles. There is an exterior brick chimney. On the south side is a modern one-story detached garage. The house reportedly was built in the 1910s, but it retains little in appearance from this early construction date.

Site P-57-000408 consists of a single-family Craftsman residence and shed. It is assumed that the house was built between 1915 and 1926.

Site 26 includes a Folk Victorian house, built before 1905, and two barns. The house is depicted on a 1905 map and was probably built by the late 1880s. The original house was rectangular, two-stories, with a gable roof and side entry. Since the time of the original construction, it has had two single-story additions and some of the original window openings have been boarded over. The outbuildings, which are contemporary with the house, have also had alterations, changes in exterior fabric, removal of windows, and other relatively major modifications.

Site P-57-000412 was recorded in 2002 by JRP Historical Consulting. It includes a one-story, single-family Minimal Tradition-style house, a hipped-roof garage, and a shed. This house is depicted on a 1953 USGS quadrangle map and, based on architectural style, may have been built as early as the 1930s. A one-room addition is present on the north façade.

Site P-57-000413 consists of a square, gable-roofed barn. Originally covered with board siding, it is now clad with metal sheets. Two trailers are also present on the property. The barn is first depicted on a 1953 USGS map but it does not appear on the 1941 USGS map, suggesting that it was constructed some time between 1941 and 1953.

Site 14 (43580 CR-17, Yolo County) contains a primary residence, a bunkhouse, trailers, sheds, and a shower house, and appears to serve as an agricultural labor camp. There are two historic-period structures, the bunkhouse and the shower house, which are first depicted on a 1953 USGS map; but they do not appear on the 1941 USGS map. Based on the use of concrete blocks and the construction style, the bunkhouse and shower house were probably built after World War II but before 1953.

Site 4 consists of two single-family residences, a garage, a pole barn, a hay barn, a well, and landscaping elements. The first residence was built in 1939-1940 by the Langs; a second, modern residence was built in 2001. Two barns are located west of the residences, one is a pre-1938 large wood-frame, gable-roof barn now clad with vertical sheets of corrugated metal, and the second is a gable-roof, open-sided structure that is less than 50 years old. A concrete, board-form well is located south of the brick house. The 1857 GLO plat map for this area depicts a house at this location labeled “Greenwoods.” The older residence and garage have not been altered and are good examples of late 1930s Minimal Tradition farmhouse architecture.

Twenty-four features of the RD 1000 (Historic American Engineering Record CA-187) are within the study corridor. The RD 1000 is a Rural Historic Landscape District that has been determined eligible for the NRHP, with State Historic Preservation Officer (SHPO) concurrence, for its major role in early 20th-century reclamation and flood control in the Sacramento Valley (Criterion A). As a National Register-eligible property, it automatically qualifies for the California Register of Historical Resources (CRHR) and therefore is a significant resource under CEQA. Although the evaluation report (Bradley and Corbett 1995) identifies certain contributing and non-contributing elements of the National Register District, the report is vague about the extensive networks of smaller levees, farm roads, canals, wells, residences, and other structures, and agricultural fields within the District’s boundaries. Thus, it is unclear whether they are considered contributing elements; in this study, they are considered to be potentially contributing elements.

The elements of the National Register District that were specifically called out by Bradley and Corbett as contributing elements include the Sacramento River levee; the East Levee; portions of the Garden Highway; Powerline Road, Riego Road, and Natomas/East Levee Road; the North, East, and West Drainage Canals; Natomas Main Drainage Canal; Natomas East Main Drainage Canal; Cross Canal and Levee;

Pleasant Grove Canal; and Pumping Plants 1-A, 2, and 3. The Line 407 route crosses several of these features.

Site P-31-000096 consists of two single-family residences, four sheds or barns, and a trailer. Mr. Gerald Minatre, the current landowner, reports that the house was built in 1917 by the Pullman family. Mr. Minatre's family bought the land in 1955. The three buildings on the south side of the lot are the house, a two-story gambrel barn, and a one-story building in the southwest corner that was once a bunkhouse, now converted into an apartment for family members.

Sites 1 and 2 are two residences built after World War II but before 1953, probably ca. 1950, during a time of great expansion in Sacramento county. Each is simple in design, with few architectural embellishments.

Site 34 includes a Minimal Tradition-style house, two barns converted into workshops, three sheds, and a modern log house. The current owners have created an irrigation pond and extensive wetlands landscaping around the new house, with willows, pistachios, pecan trees, camphor trees, and ornamental and native plants and shrubs. According to the current landowners, this house and property were part of the Stolenberg farm from the 1950s through the 1970s. The house is depicted on a 1953 USGS map and may date back to the late 1930s.

Site 3 is a residence built ca. 1920. The 1911 Arcade USGS quadrangle shows a structure at this location, but based on architectural style and materials, it is believed that the current structure was built later. The residence is also depicted on the 1953 USGS quadrangle.

Site P-31-002684 is an historic-period structure that was recorded in 2002 by JRP Historical Consulting. It is an irregularly-shaped Minimal Tradition residence with a composition shingle roof, wooden board-and-batten siding with a brick skirt, and an attached garage. It has been recently modified, as evidenced by sliding aluminum windows and aluminum garage doors. The house was built just after World War II.

The Eagle Hotel (P-31-003307) and an adjacent barn are depicted on GLO plat maps dating from the 1850s. Roadhouses were common throughout the area during this period. Many, such as this one, disappeared into obscurity after a few years and left no historical record. There are no references in either Sacramento or Sutter county histories to an Eagle Hotel in this area. None of the hotel's architectural elements were observed on the surface, nor were any artifacts found dating to this period. Surface finds included modern day concrete rubble piles, a refuse pile dating between the 1950s and 1970s, a concrete slab with a metal pipe, and planted fruit and shade trees. The only surface feature that may be associated with the Eagle Hotel is an 8-foot-wide, 1-foot-deep depression where recent concrete block fragments have been dumped. With the possible exception of the planted trees, all other artifacts and landscape features appear to date to the early-to mid-20th century. It is possible, however, that subsurface features associated with the hotel (cellars, privies, dumps, wells, etc.) are present on the property.

One isolated obsidian biface was found in a shallow, narrow drainage furrow near the base of a moderate southeast-facing slope, approximately 300 feet west of an unnamed drainage. The tool was made from opaque black obsidian and measured 2.1 inches long by 1 inch wide and 0.3 inches thick. The surrounding area was carefully examined, and no other archaeological material was found.

Site P-31-001137 is a small, unornamented, one-story building used to assist instrument landings at McClellan Air Force Base. It was built after 1952 but was abandoned by 1987, when the Air Force sold the property. The structure has been recommended as not eligible for the National Register (Napoli 2000).

Site CA-PLA-945H (P-31-001135) is a small, historic-period refuse scatter recorded in 1999 in a plowed field within the Line 407 corridor. Artifacts noted included dark-brown earthenware, yellow earthenware, and white ironstone ceramics, as well as clear-glass bottle fragments. The only artifacts that were observed in the dense weeds during current Project fieldwork were a faceted aqua glass fragment and a fragment of yellow earthenware ceramic.

Wells

Four wells were recorded within the Line 407 study corridor. These range from abandoned wells with dilapidated concrete structures (W15); to intact, working systems with a pump house, vent, and concrete drain (W13); an original concrete drain with a new pump (Road 16A Well); and a metal stand pipe abandoned in favor of a new well (Road 17 Well).

Wells W13 and W15 are included in RD 820, a small district established soon after completion of the Knights Landing Ridge Cut in 1915. The wells along CR-16A and CR-17 do not appear to be associated with a formal irrigation district and are privately owned and operated.

Culverts, Ditches, Canals, Private Levee

Two culverts on CR-17 were newly recorded. Both are board-form concrete structures still functioning as culverts.

One irrigation ditch was noted during the course of the Line 406 realignment survey west of the town of Yolo. The irrigation ditch was recorded and plotted on an aerial map, but it is unclear whether this ditch is historic or modern in age. Subsequent historical research (which is planned as part of upcoming survey for the Line 406 alternative routes) will provide information to determine if the irrigation ditch is historic (over 45 years of age). If it is over 45 years old, a DPR Primary form will be completed and submitted to the Northwest Information Center in Sonoma.

Six ditches or canals were recorded in the Line 407 study corridor, all in eastern Yolo County. All are features that currently deliver irrigation water to agricultural fields. Two ditches were newly recorded west of the Colusa Drain on either side of CR-17 (Ditches 1 and 2), and a third (Ditch 3) was newly recorded east of the Colusa Drain. The ditch system previously recorded as P-57-000521 was revisited and the site record updated to include additional distribution ditches.

Finally, one private levee was previously recorded as CA-YOL-212H. The site record was adequate and therefore was not updated for this study.

Historic-period Roads

Four historic-period road alignments were recorded near the western terminus of the Line 407 corridor north of the town of Yolo. These are all single-lane paved surfaces, and all are patched and maintained for current use. They include CR-98A, 98E, 99A, and the portion of CR-17 west of its intersection with SR-113.

East of the Sacramento River, nine road alignments that intersect Riego Road and Baseline Road are plotted on historic-period USGS quadrangles (1953 or earlier): Pacific Avenue, Pleasant Grove Road, Elder Road, Locust Road, Brewer Road, Palladay Road, Country Acres Road, Watt/Center Joint Roads, and a recently abandoned segment of Walerga Road. Pacific Avenue and Pleasant Grove Road, which have been thoroughly rebuilt, retain no historical integrity. Except for Walerga Road, all roads are modern, paved, currently maintained, and in use. Two of these roads appear to be associated with RD 1000.

Historic-period Railroads

Two railroads, one still in operation, run roughly north-south along the eastern edge of the American Basin, a region east of Highway 99 that centers immediately west of the town of Rio Linda. The Western Pacific Railroad is an extant rail line. The abandoned Sacramento Northern Railroad is about 1,000 feet to the east; all of its rails and ties have been removed. The portions of each of the railroads in Placer and Sacramento counties have been recommended not eligible for listing on the National or California registers (Waechter et al. 2007), but the segments of each in Sutter County remain unevaluated.

Other Potential Resources

A review of geological and soils data identified seven areas on the Line 407 corridor that are considered sensitive for buried archaeological resources that might be obscured by recent alluvial deposits. These areas occur on levee ridges adjacent to stream channels, and are overlain by soil series with documented buried soil horizons on which archaeological sites might be located.

Structures built in the 1800s or early 1900s often had privies, trash dumps, or wells constructed behind the main buildings that subsequently were filled in or buried. Such features can contribute to a site's overall National Register eligibility. Within the survey area, there are several such locations where subsurface features could occur. The most sensitive location is the site of the former Eagle Hotel previously located at the northeast corner of Baseline Road and Country Acres Road. Parcels where the recommended-eligible Cramer House and eight unevaluated historic-period residences are located may also have associated buried features. These parcels include the locations of structures 1-4, P-51-000406, and the parcel of the 1917 residence on Powerline Road (P-51-00096). The Powerline Road residence is within the boundary of RD 1000 and may need to be addressed as part of the district.

Traditional Cultural Properties/Areas of Native American Concern

To date, no traditional cultural properties or specific areas of Native American concern have been identified within the Project area. One Native American asserted that he knew of sites near the Project corridor, but none within the APE. Several Native American individuals expressed concern about the Project in general, and one recommended the preparation of a discovery plan in the event that cultural remains were uncovered during construction, but no one had information to share about particular sites or specific locations that needed protection.

Resources Dropped from Consideration

Utility Pole Lines

Utility poles run along parts of CR-16A and 17. Although these routes are depicted on early historic maps, the existing poles are tall, modern replacements of the original wooden poles. Only a few shorter poles were noted along CR-17. The pole line routes were not formally recorded because of their compromised integrity.

Project Historic Architectural Study Area Record Search and Survey Results

The Area of Potential Effects (APE) for the Project was established to include all resources that could potentially be directly or indirectly affected by the proposed undertaking. All of the resources are located within 50 feet of either side of the pipeline centerline and are within Yolo County. Appendix F-5, APE map, illustrates the boundaries delineating the APE and notes the location of the ten properties evaluated during the historic architectural survey.

During the course of the historic architectural survey, nine properties located within the Project APE required evaluation. The Herman Richter house located at 13464 County Road 97F was previously recorded and is listed in the Historic Resources Inventory. However, it does not appear to have been previously evaluated for the NRHP and CRHR. Additionally, the other eight properties have not been previously evaluated for listing on the NRHP or the CRHR. Following are brief descriptions of the nine properties.

27390 County Road 17 is a farmstead including a one-story single-family residence with no architectural style and an associated machinery barn. Built ca. 1940s, it is considered not eligible for listing on the NRHP or CRHR.

27960 County Road 19 is a farmstead with a one-story single-family residence with no architectural style and an associated horse barn. Constructed ca. 1940s, it is considered not eligible for listing on the CRHR or NRHP.

27660 County Road 19 is a farmstead containing a one-story single-family residence with no architectural style and a few associated wood outbuildings. Constructed ca. 1950s, it is considered not eligible for inclusion on the CRHR or NRHP.

32840 County Road 17 is the Horgan family farmstead consisting of two one-story single-family residences in the Craftsman and Minimal Traditional styles. This farm also has a wood frame barn dating to the late nineteenth century, a two-story grain storage building from the 1930s and a metal barn from the 1950s. The Craftsman was built in the late 1920s and had a significant remodel in 2006, and the Minimal Traditional was constructed ca. 1950s. Neither of the residences or buildings are considered eligible for listing on the CRHR or NRHP.

13464 County Road 97F is the Herman Richter House, a two-story Mediterranean Revival style single-family residence. There is an associated older house on the property. This farmstead has ancillary buildings such as an early 1900s garage, a smoke house, a birdhouse, a barn, and a granary. The Mediterranean Revival residence was constructed in 1927 and the one-story residence was built circa 1865 to 1875 but had significant remodels beginning in 1949. This property is considered eligible for listing on the CRHR and NRHP.

13488 County Road 98 is the Gorman Ranch consists of a two-story Prairie style single-family residence, as well as a one-story house. There are several ancillary buildings and structures including a barn, a windmill, garages, wells, and a modern warehouse. The Prairie style residence was constructed ca. 1900 but underwent a significant remodel ca. 2000. The one-story residence was built ca. 1930s. None of the buildings are considered eligible for listing on the CRHR or NRHP.

38023 County Road 16A is a farmstead with a one-story single-family residence with no architectural style, a barn/garage, two sheds and a modern warehouse. Built ca. 1900 with remodels in the 1930s and 1990s, this property is considered not eligible for listing on the CRHR or NRHP.

38871 County Road 16A is a farmstead with a one-story single-family residence with no architectural style, a three-car garage and a barn. Built ca. 1910, this property is considered not eligible for the CRHR or the NRHP.

14020 County Road 99A is a farmstead with a two-story single-family residence with no architectural style and two barns. Built in the late 1880s, the buildings are not considered eligible for listing on the CRHR or the NRHP.

Results of Historic Architectural Survey

During the course of the architectural survey, nine farmstead properties were identified within the Project APE with buildings that are more than 45 years old and therefore required consideration for inclusion on the NRHP or the CRHR. Although the Herman Richter House located at 13464 County Road 97F was previously recorded and is listed on the Historic Resources Inventory, it does not appear to have been evaluated against the NRHP or CRHR criteria. In addition, the other eight properties have not been previously evaluated using the NRHP or the CRHR criteria.

Therefore, in accordance with 36 Code of Federal Regulations (CFR) Part 800.4(c) of section 106, the NRHP criteria were applied to determine whether there are eligible historic properties (36 CFR Part 63). A historical resource, for the purposes of CEQA, is defined by Public Resources Code (PRC) 5020.1 (j), as any object, building, structure, site, area, place, record, or manuscript which is determined to be historically significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California. The criteria used for evaluation in these areas include those criteria outlined in PRC section 5024.1, Title 14 CCR, section 4852 for inclusion in the CRHR.

Of the nine farmstead properties identified within the Project APE that required consideration for inclusion on the NRHP or the CRHR, only one historic property that may be affected by the Project was considered to meet the NRHP and CRHR criteria. This property consisted of the Herman Richter House, a Mediterranean Revival style single-family residence located at 13464 County Road 97F. The other eight properties did not meet the criteria for inclusion in the NRHP or CRHR.

The Herman Richter House was determined to be a historic property for the purposes of section 106 and a historical resource under CEQA. Therefore, this property may be affected by the Project for the purposes of section 106 and this resource may be impacted by the Project for the purposes of CEQA.

Under section 106, an assessment was made whether the Project would have an adverse effect on this property. An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion on the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association (section 800.5(a)(1)). An example of an adverse effect is the physical destruction of or damage to all or part of the property.

Under CEQA, the potential for the proposed Project to have a significant effect on the environment was considered. A project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment (PRC section 21084.1). The purpose of this assessment of impacts is to determine whether the proposed Project would cause a substantial adverse change on the identified historical resource within the proposed Project area. Substantial adverse change to a historical resource includes demolition, destruction, relocation, or alteration such that the significance of an historical resource would be impaired (PRC section 5020.1 (q)). The CEQA Guidelines provide that a project that demolishes or alters those physical characteristics of a historical resource that conveys its historical significance (i.e., its character defining features) that justify its inclusion in the CRHR or its significance in a historical resource survey, can be considered to materially impair the resource's significance.

The Project pipeline route would be located approximately 100 feet south of the Herman Richter historic residence. At this location, the section of pipeline within the APE involves 2,000 feet of horizontal directional drilling (HDD). HDD is a trenchless construction method that uses a hydraulically-powered horizontal drilling rig to tunnel under vertically, and in this case, horizontally large and sensitive surface areas. In recent years, this has become a preferred method for the installation of oil and gas pipelines in sensitive areas because it is a potentially low impact construction technique. It is used in situations such as lake crossings, wetland crossings, and sensitive wildlife habitat.

Paleontologic Resources

Paleontologic resources are fossilized evidence of past life found in the geologic record. Despite the prodigious volume of sedimentary rock deposits preserved worldwide and the enormous number of organisms that have lived through time, preservation of plant or animal remains as fossils is an extremely rare occurrence. Because of the infrequency of fossil preservation, fossils (particularly vertebrate fossils) are considered to be nonrenewable resources. Because of their rarity and the scientific information they can provide, fossils are highly significant records of ancient life. As such, paleontological resources may be considered "historically significant" in the scientific annals of California under the CEQA Guidelines section 15064.5[3].

Assessment of the Project site's paleontological sensitivity and potential, prior to construction, was determined by (1) reviewing available geologic maps and publications, and prior reports, to determine the geologic units that could be impacted; and (2) searching the University of California Museum of Paleontology database for localities and specimens recorded from those geologic units in each of the counties involved.

The Project, including its alternative routes, transects a relatively flat area in the Central Valley where five sedimentary rocks units, and some Sierran basement rocks, are mapped. The sedimentary units, from oldest to youngest, are the Modesto Riverbank, Turlock Lake, and Red Bluff formations of Pleistocene age, and the Pliocene Tehama Formation. These units consist mostly of alluvial deposits derived from erosion of the highlands flanking the Central Valley (e.g., Coast Ranges to the West, Sierra Nevada to the east).

4.5.2 Regulatory Setting

The regulatory framework that mandates consideration of cultural and paleontological resources in project planning includes Federal, State, and local governments. Government agencies have developed laws and regulations designed to protect significant cultural resources that may be affected by projects regulated, funded, or undertaken by the agency. Federal and State laws that govern the preservation of historic and archaeological resources of national, State, regional, and local significance include the National Environmental Policy Act (NEPA), the National Historic Preservation Act (NHPA), and CEQA. In addition, laws specific to work conducted on Federal lands includes the Archaeological Resources Protection Act (ARPA), the American Antiquities Act, and the Native American Graves Protection and Repatriation Act (NAGPRA).

Federal

Federal agencies are required to consider the effects of their actions on historic properties and afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on such undertakings under NEPA. Federal agencies are responsible for initiating NEPA and NHPA section 106 review and completing the steps in the process that are outlined in the regulations. They must determine if NHPA section 106 applies to a given project and, if so, initiate review in consultation with the SHPO and/or Tribal Historic Preservation Officer (THPO). Federal agencies are also responsible for involving the public and other interested parties. Furthermore, NHPA section 106 requires that any Federal or federally assisted undertaking, or any undertaking requiring Federal licensing or permitting, consider the effect of the action on historic properties listed in or eligible for listing on the NRHP. Under 36 CFR Part 800.8, Federal agencies are specifically encouraged to coordinate compliance with NEPA, section 106 of the NHPA, and the NEPA process. The implementing regulations “Protection of Historic Properties” are found in 36 CFR Part 800. Resource eligibility for listing on the NRHP is detailed in 36 CFR Part 63 and the criteria for resource evaluation are found in 36 CFR Part 60.4 [a-d].

The NHPA established the NRHP as the official Federal list for cultural resources that are considered important for their historical significance at the local, State, or national level. To be determined eligible for listing in the NRHP, properties must meet specific criteria for historic significance and possess certain levels of integrity of form, location, and setting. The criteria for listing on the NRHP are significance in American history, architecture, archaeology, engineering, and culture as present in districts, sites, buildings, structures and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association. In addition, a resource must meet one or all of these eligibility criteria:

A. Is associated with events that have made a significant contribution to the broad patterns of our history;

B. Is associated with the lives of persons significant in our past;

C. Embodies the distinctive characteristics of a type, period, or method of construction; represent the work of a master; possess high artistic values, represent a significant and distinguishable entity whose components may lack individual distinction; or

D. That have yielded, or may be likely to yield, information important in prehistory or history.

Criterion D is usually reserved for archaeological resources. Eligible properties must meet at least one of the criteria and exhibit integrity, measured by the degree to which the resource retains its historical properties and conveys its historical character.

Criteria Considerations

Ordinarily cemeteries, birthplaces, graves of historical figures, properties owned by religious institutions or used for religious purposes, buildings that have been moved from their original locations, reconstructed historic buildings, properties primarily commemorative in nature, and properties that have achieved significance within the past 50 years would not be considered eligible for the NRHP. However, such properties would qualify if they were integral parts of districts that do meet the criteria or if they fall within the following categories:

- A religious property deriving primary significance from architectural or artistic distinction or historical importance;
- A building or structure removed from its original location but which is primarily significant for architectural value, or which is the surviving structure most importantly associated with a historic person or event;
- A birthplace or grave of a historical figure of outstanding importance if there is no appropriate site or building associated with his or her productive life;
- A cemetery that derives its primary importance from graves of persons of transcendent importance, from age, from distinctive design features, or from association with historic events;
- A reconstructed building when accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan, and when no other building or structure with the same association has survived;
- A property primarily commemorative in intent if design, age, tradition, or symbolic value has invested it with its own exceptional significance; or
- A property achieving significance within the past 50 years if it is of exceptional importance.

Thresholds of Significance

In consultation with the SHPO/THPO and other entities that attach religious and cultural significance to identified historic properties, the lead agency shall apply the criteria of adverse effect to historic properties within the APE. The lead agency official shall consider the views of consulting parties and the public when considering adverse effects.

Federal Criteria of Adverse Effects

Under Federal regulations, 36 CFR Part 800.5, an adverse effect is found when an undertaking alters, directly or indirectly, any of the characteristics of a historic property that qualifies the property for inclusion in the NRHP in a manner that diminishes the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration would be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for listing in the NRHP. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance, or be cumulative.

Pursuant to 36 CFR Part 800.5, adverse effects on historic properties include, but are not limited to, those listed below:

- Physical destruction of or damage to all or part of the property;
- Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation, and provision of handicapped access, that is not consistent with the U.S. Secretary of the Interior's Standards for the Treatment of Historic Properties in accordance with 36 CFR Part 68 and applicable guidelines;
- Removal of the property from its historic location;
- Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance;
- Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features;
- Neglect of a property that causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization; or
- Transfer, lease, or sale of property out of federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long term preservation of the property's historic significance.

If Adverse Effects Are Found

If adverse effects are found, the agency official shall continue consultation as stipulated at 36 CFR Part 800.6. The agency official shall consult with the SHPO/THPO and other consulting parties to develop alternatives to the undertaking that could avoid, minimize, or mitigate adverse effects to historic resources.

Pursuant to 36 CFR Part 800.14(d), if adverse effects cannot be avoided then standard treatments established by the ACHP maybe used as a basis for Memorandum of Agreement (MOA).

Pursuant to 36 CFR Part 800.11(e) the filing of an approved MOA, and appropriate documentation as specified, concludes the section 106 process. The MOA must be signed by all consulting parties and approved by the ACHP prior to construction activities. If no adverse affects are found and the SHPO/THPO or the ACHP does not object within 30 days of receipt, the agencies responsibilities under section 106 would be satisfied upon completion of report and documentation as stipulated in 36 CFR Part 800.11. The information must be made available for public review upon request, excluding information covered by confidentiality provisions.

There are no Federal regulations pertaining to paleontological resources.

State

Cultural Resources

An archaeological site may be considered a historical resource if it is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military or cultural annals of California in accordance with Public Resources Code (PRC) section 5020.1(j) or if it meets the criteria for listing on the CRHR that are consistent with Title 14 CCR section 4850.

The most recent amendments to the CEQA Guidelines direct lead agencies to first evaluate an archaeological site to determine if it meets the criteria for listing in the CRHR. If an archaeological site is a historical resource, in that it is listed or eligible for listing in the CRHR, potential adverse impacts to it must be considered, in accordance with PRC sections 21084.1 and 21083.2(l). If an archaeological site is considered not to be a historical resource, but meets the definition of a “unique archeological resource” as defined in PRC section 21083.2, then it would be treated in accordance with the provisions of that section.

With reference to PRC section 21083.2, each site found within a project area will be evaluated to determine if it is a unique archaeological resource. A unique archaeological resource is described as an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets one or more of the following criteria:

- Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information;

- Has a special and particular quality such as being the oldest of its type or the best available example of its type; or

- Is directly associated with a scientifically recognized important prehistoric or historic event or person.

As used in this analysis, “non-unique archaeological resource” means an archaeological artifact, object, or site that does not meet the criteria for eligibility for listing on the CRHR, as noted in subdivision (g) of PRC section 21083.2. A non-unique archaeological resource requires no further consideration, other than simple recording of its components and features. Isolated artifacts are typically considered non-unique archaeological resources. Historic structures that have had their superstructures demolished or removed can be considered historic archaeological sites and are evaluated following the processes used for prehistoric sites. Finally, the Office of Historic Preservation (OHP) recognizes an age threshold of 45 years. Cultural resources built less than 45 years ago may qualify for consideration, but only under extraordinary circumstances.

Title 14, CCR, Chapter 3 section 15064.5 is associated with determining the significance of impacts to archaeological and historical resources. Here, the term historical resource includes the following:

- A resource listed in, or determined eligible by the State Historical Resources Commission, for listing in the CRHR (PRC section 5024.1; Title 14 CCR, section 4850, et seq.);

- A resource included in a local register of historical resources, as defined in PRC section 5020.1(k) or identified as significant in an historical resource survey meeting the PRC section 5024.1(g) requirements, shall be presumed to be historically or culturally significant. Public agencies must treat any such resource as significant unless the preponderance of evidence demonstrates that it is not historically or culturally significant; and

- Any object, building, structure, site, area, place, record, or manuscript, which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California may be considered an historical resource, provided the lead agency's determination is supported by substantial evidence in light of the whole record. Generally, a resource shall be considered by the lead agency to be historically significant if the resource meets the criteria for listing on the California Register of Historical Resources (PRC section 5024.1; Title 14 CCR section 4852) including the following:

A. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;

B. Is associated with the lives of persons important in our past;

C. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or

D. Has yielded, or may be likely to yield, information important in prehistory or history.

Typically, archaeological sites exhibiting significant features qualify for the CRHR under the criterion D. because such features have information important to the prehistory of California. A lead agency may determine that a resource may be a historical resource as defined in PRC section 5020.1(j) or 5024.1 even if it is:

- Not listed in or determined to be eligible for listing in the CRHR;
- Not included in a local register of historical resources pursuant to PRC section 5020.1(k); or
- Identified in an historical resources survey per PRC section 5024.1(g).

Paleontological Resources

Public Resources Code Section 5097.5

California Public Resources Code section 5097.5 prohibits excavation or removal of any "vertebrate paleontological site, or any other archaeological, paleontological or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands." Public lands are defined to include lands owned by or under the jurisdiction of the state or any city, county, district, authority or public corporation, or any agency thereof. Section 5097.5 states that any unauthorized disturbance or removal of archaeological, historical, or paleontological materials or sites located on public lands is a misdemeanor.

Local

Yolo, Sacramento, Sutter, and Placer counties maintain general plans that reflect elements found in the CEQA Guidelines. The Yolo County General Plan Historic Preservation Element states in HP1 Goal, that Yolo County "shall support the preservation and enhancement of historic and prehistoric resources within the County when fiscally able." The Yolo County General Plan does not specifically address paleontological resources.

Although there is no specifically stated goal within the Sutter County General Plan concerning historic or archaeological resources, the Parks and Recreation Advisory Commission is tasked with "encourage(ing) the planned development of . . . special facilities accommodating such leisure-time activities as golf, zoological attractions, and historical areas . . ." There is no specifically stated goal within the Sutter County General Plan concerning paleontological resources.

The Sacramento County General Plan Goal under Section VI, Cultural Resources, is to "promote the inventory, protection, and interpretation of the cultural heritage of Sacramento County, including historical and archaeological settings, sites, buildings, features, artifacts, and/or areas of ethnic historical, religious or socio-economical importance." There is no specifically stated goal within the Sacramento County General Plan concerning paleontological resources.

The Placer County General Plan Cultural Resources Goal 5.D. for cultural and paleontological resources is to "identify, protect, and enhance Placer County's important historical, archaeological, paleontological, and cultural sites and their contributing environment."

4.5.3 Significance Criteria

Cultural Resources

An adverse impact on cultural resources is considered significant and would require mitigation if Project construction or operation would:

1. Result in damage to, the disruption of, or otherwise adversely affect a property that is listed in the NRHP, the CRHR, or a local register of historical resources as per section 5020.1 of the Public Resources Code;

2. Result in damage to, the disruption of, or otherwise adversely affect an important archaeological resource (prehistoric or historic) such that its

integrity could be compromised or its eligibility for future listing in the NRHP or CRHR could be diminished;

3. Result in damage to, the disruption of, or otherwise adversely affect an important historical resource such that its integrity could be compromised or its eligibility for future listing in the NRHP or CRHR diminished; or

4. Disturb any human remains.

Paleontological Resources

An impact to an identified paleontologic resource is considered "historically significant" and would require mitigation if:

1. Project construction or operation would result in damage or loss of vertebrate or invertebrate fossils that are considered important by paleontologists and land management agency staff; or

2. The resource is considered to have scientific or educational value. A paleontological resource can be considered to have scientific or educational value if it:

   a. provides important information on the evolutionary trends among organisms, relating living inhabitants of the earth to extinct organisms;

   b. provides important information regarding development of biological communities or the interaction between botanical and zoological biota;

   c. demonstrates unusual or spectacular circumstances in the history of life;

   d. is in short supply and in danger of being depleted or destroyed by the elements, vandalism, or commercial exploitation and is not found in other geographic locations;

   e. is recognized as a natural aspect of our national heritage;

   f. lived prior to the Holocene (~11,000 B.P.); and

   g. is not associated with an archaeological resource, as defined in section 3(1) of the Archaeological Resources Protection Act of 1979 (16 USC section 470bb[1]).

4.5.4 Applicant Proposed Measures

Applicant Proposed Measures (APMs) have been identified by PG&E in its Environmental Analysis prepared for the California State Lands Commission (CSLC). APMs that are relevant to this section are presented below. This impact analysis assumes that all APMs would be implemented as defined below. Additional mitigation measures are recommended in this section if it is determined that APMs do not fully mitigate the impacts for which they are presented.

Cultural Resources

Where feasible, PG&E would avoid all Project impacts to eligible or unevaluated cultural resources. Avoidance measures may include fencing the resource during Project construction or directional drilling under the resource. If temporary fencing is chosen, an archaeologist would monitor placement of the fencing to ensure resource protection.

If Project impacts to resources cannot be avoided, each unevaluated site would need to be evaluated for its eligibility to the NRHP or CRHR through archival research and/or excavations (for archaeological components). Evaluation of sites would be done in consultation with the CSLC and (for prehistoric resources) the appropriate Native American groups(s).

For sites determined ineligible to the NRHP or CRHR, no further management consideration is necessary. If a site proves eligible and impacts cannot be avoided, it may be necessary to further mitigate those impacts. For prehistoric and historic-era archaeological resources, mitigation measures can include data recovery (archival research and/or excavation) by a qualified archaeologist, and public outreach (interpretive displays, brochures, videos, etc.). Any data recovery at prehistoric sites would be done in consultation with the CSLC and relevant Native American group(s). For historical structures (buildings, canals, railroads, etc.), archival research, and Historic American Buildings Survey/Historic American Engineering Record (HABS/HAER) documentation by a qualified historian or architectural historian are commonly considered sufficient mitigation.

APM CR-1. PG&E will evaluate all unavoidable unevaluated resources in the project APE for their National Register or California Register eligibility through test excavations (for archaeological sites), archival research (for historic-era properties), HABS/HAER recordation (for standing structures), or other means, as appropriate. Resources determined through evaluation to be ineligible will be dropped from further management; those determined eligible will be subject to APM CR-2.

APM CR-2. PG&E will protect all significant/eligible resources in the project APE from project impacts, including all contributing or potentially contributing features of RD 1000. Where impacts cannot be avoided, a Finding of Effect will be prepared for each significant/eligible resource. Where the Finding of Effect identifies an adverse impact to a significant/eligible resource, the impact(s) will be mitigated through data recovery excavations, archival research, HABS/HAER recordation, or other means, as appropriate.

APM CR-3. PG&E will test the reported location of the historic Eagle Hotel, and other areas identified as sensitive for buried archaeological remains, prior to construction by backhoe trenching. All trenching will be supervised by a qualified professional archaeologist and/or geo-archaeologist. If any buried materials are uncovered, work will stop temporarily at that location, until the monitor can assess the find and determine the appropriate action.

APM CR-4. PG&E will consult with the local Native American community prior to any subsurface excavation at prehistoric archaeological sites to give them the opportunity to monitor the excavations. If the Native American community requests it, a Discovery Plan will be developed prior to excavation to outline the appropriate treatment of archaeological materials or human remains. The discovery of human remains outside a dedicated cemetery also will require compliance with State Health and Safety Code Section 7050.5.

APM CR-5. PG&E will provide all construction personnel with environmental training prior to the initiation of construction activities. Training will describe the types of cultural resources in the project area and emphasize the importance of the resources and the need for their protection. Training will also address the possibility that previously unidentified cultural resources or human remains may become apparent during ground-disturbing activities, and will define procedures to be implemented if they are discovered.

Paleontologic Resources

APM PALEO-1. Prior to ground-disturbing activities the project paleontologist will provide input for inclusion in the environmental training to be provided to all construction personnel, which will include the paleontologic resource issues associated with the PG&E Line 406 and 407 project, including the following:

- definition of a fossil,
- types of geologic units in the project area,
- any known fossil locales in or adjacent to the project area,
- potential of the geologic units in the project area to produce fossils, and
- measures to follow in the event fossils are discovered in the project area.

APM PALEO-2. All workers on the project involved in ground-disturbing activities will be required to participate in the environmental training and will be familiar with the compliance measures pertaining to paleontological resources. The worker-training program shall be sufficient in scope to make the workers aware of the importance and purpose of the paleontological monitoring program and is not intended to enable workers to discern between fossil and non-fossil material.

APM PALEO-3. For areas with high paleontological sensitivity, PG&E will retain a qualified paleontologist (Conformable Impact Mitigation Guidelines Committee, 1995) to organize and supervise an appropriate level of monitoring of ground-disturbing activities, data recovery and analysis, preparation of a data recovery report or other reports, and the accession of recovered fossil material to an accredited paleontological repository, such as the UCMP, for those project areas lying directly on geologic units. This includes the Tehama, Red Bluff, Turlock Lake, Riverbank, and Modesto formations. Methods for monitoring, recovery, reporting and curation will be outlined in a Discovery Plan prior to construction.

APM PALEO-4. For the portion of the Line 407 West project area east of Yolo, PG&E will retain a qualified paleontologist (Conformable Impact Mitigation Guidelines Committee, 1995) to organize and supervise monitoring of initial ground-disturbing activities and continued spot-check monitoring of ground-disturbing activities, data recovery and analysis, preparation of a data recovery report or other reports, and the accession of fossil material to an accredited paleontological repository, such as the UCMP.

APM PALEO-5. If paleontological resources are discovered during project activities when a paleontological monitor or qualified paleontologist (Conformable Impact Mitigation Guidelines Committee, 1995) is not present, all work within 25 feet of the discovery will be redirected and/or halted until a qualified paleontologist has assessed the situation and made recommendations regarding treatment of the resources. Project personnel will not move or collect any paleontological resources.

4.5.5 Impact Analysis and Mitigation

Impact Discussion

Cultural Resources

Listed Properties

The Project would not result in damage to, the disruption of, or otherwise adversely affect a property that is listed in the National Register of Historic Places (NRHP), the California Register of Historic Resources (CRHR), or a local register of historical resources per section 5020.1 of the Public Resources Code. Impacts would be less than significant (Class III).

Important Archaeological Resources

The Project would not result in damage to, the disruption of, or otherwise adversely affect an important archaeological resource (prehistoric or historic) such that its integrity could be compromised or its eligibility for future listing in the NRHP or CRHR could be diminished. Any artifacts found on lands under the jurisdiction of the CSLC are considered the property of the state of California. Any disposition of these artifacts requires the approval of the CSLC and a potential transfer of title would be required. Impacts would be less than significant (Class III).

Important Historic Resources

The Project pipeline route would be located approximately 100 feet south of the Herman Richter historic residence. At this location, the section of the Project pipeline within the APE involves 2,000 feet of HDD operations.

By using HDD at this location, there would not be direct physical destruction or alteration to the identified historic property/historical resource, and therefore would not change the character of the property's features or setting that contributes to its significance. However, the potential for damage as a result of vibration from the HDD drilling was considered. It was determined that the process would not cause significant vibration to potentially physically damage the historic property/historical resource that is located 100 feet away.

Therefore, in accordance with 36 CFR 800.5(b) of section 106, there is a finding of no adverse effect for the Project. In accordance with CEQA, there will be no significant impacts to a historic resource (Title 14 CCR section 15064.5(b)).

The Project would not result in damage to, the disruption of, or otherwise adversely affect an important historical resource such that its integrity could be compromised or its eligibility for future listing in the NRHP or CRHR diminished. Impacts would be less than significant (Class III).

Human Remains

The Project would not disturb any human remains. Impacts would be less than significant (Class III).

Paleontological Resources

Impact PALEO-1: Fossils

Project construction or operation would result in damage or loss of vertebrate or invertebrate fossils that are considered important by paleontologists and land management agency staff (Potentially Significant, Class II).

The Project transects a relatively flat area in the Central Valley where five sedimentary rocks units, and some Sierran basement rocks, are mapped. The sedimentary units, from oldest to youngest, are the Modesto, Riverbank, Turlock Lake, and Red Bluff formations of Pleistocene age, and the Pliocene Tehama Formation. Paleontologic resources are fossilized evidence of past life found in the geologic record. Because of the infrequency of fossil preservation, fossils (particularly vertebrate fossils) are considered to be nonrenewable resources. Because of their rarity and the scientific information they can provide, fossils are highly significant records of ancient life.

Upon implementation of APM CR-1 through CR-5 and APM PALEO-1 through PALEO-5, listed above, all significant fossils that would otherwise have been adversely impacted by the Project would have been salvaged and removed from the Project site. Further mitigation is required for proper curation of any fossil.

<u>Mitigation Measures for Impact PALEO-1: Fossils</u>

MM PALEO-1. **Proper Curation of Fossil Collection.** The Project paleontologist shall ensure that the fossil collection is properly curated to the point of identification and complete a data recovery report that includes a map plotted with fossil localities and detailed lists or tables of all specimens and localities.

<u>Rationale for Mitigation</u>

Preliminary preparation and documentation of a fossil collection is generally required prior to its acceptance by and transfer to an accredited repository. Offsite preparation of specimens would include minimizing excessive matrix, labeling with field locality and specimen numbers, and enclosing in adequately protective packaging for transport and storage. These tasks would enhance subsequent evaluation and curation by the chosen repository.

Impact PALEO-2: Scientific or Educational Value

The Project is considered to be a resource having scientific or educational value based on the significance criteria given in Section 4.6.3 (Potentially Significant, Class II).

The Project transects a relatively flat area in the Central Valley where five sedimentary rocks units, and some Sierran basement rocks, are mapped. The sedimentary units, from oldest to youngest, are the Modesto, Riverbank, Turlock Lake, and Red Bluff formations of Pleistocene age, and the Pliocene Tehama Formation. Paleontologic resources are fossilized evidence of past life found in the geologic record. Because of the infrequency of fossil preservation, fossils (particularly vertebrate fossils) are considered to be nonrenewable resources. Because of their rarity and the scientific information they can provide, fossils are highly significant records of ancient life. Upon implementation of APM CR-1 through CR-5 and APM PALEO-1 through PALEO-5, listed above, all significant fossils that would otherwise have been adversely impacted by the Project would have been salvaged and removed from the Project site. Further mitigation is required for proper delivery of any fossil to an accredited repository.

Mitigation Measures for Impact PALEO-2: Scientific or Educational Value

MM PALEO-2. Delivery of Fossil Collection to Appropriate Location. The Project paleontologist shall ensure that the fossil collection, with a copy of the report, is delivered to an accredited paleontological repository, such as the University of California Museum of Paleontology (UCMP) in Berkeley. Any artifacts found on lands under the jurisdiction of the CSLC are considered the property of the state of California. Any disposition of these artifacts requires the approval of the CSLC and a potential transfer of title will be required.

Rationale for Mitigation

Fossils are nonrenewable resources that have scientific and educational value. Each specimen provides data that enables reconstruction of the biotic communities, climate, geography, and evolution of the prehistoric world. The fossil record reveals changes through geologic time that enable scientists to better understand the modern world and the potential consequences of both gradual and abrupt changes in its environments, whether natural or related to human activities. The mitigation measure ensures that any fossil collection would be permanently incorporated into the larger collection of an appropriate curatorial facility so that the specimens would be properly curated and available to present and future generations of research scientists and students.

4.5.6 Impacts of Alternatives

A No Project Alternative as well as twelve options have been proposed for the alignment in order to minimize environmental impacts of the proposed Project and to respond to comments from nearby landowners. The twelve options, labeled A through L, have been analyzed in comparison to the portion of the proposed route that would be avoided as a result of the option. Descriptions of the options can be found in Section 3.0, Alternatives and Cumulative Projects, and are depicted in Figure 3-2A through Figure 3-2K. A comparison of the cultural resource impacts is found in Table 4.5-2. A comparison of paleontological resource impacts is found in Table 4.5-3. APMs CR-1 through CR-5, and APMs PALEO-1 through PALEO-5, designed to reduce cultural and paleontological impacts that would result from Project construction, would apply to all twelve options.

Cultural Resources

No Project Alternative

Under the No Project Alternative, no natural gas pipeline would be constructed. As such, there would be no impacts to cultural resources if the No Project Alternative were selected.

Option A

Option A would shift approximately 14 miles of pipeline away from numerous residences located along CR-17 to the sparsely populated area to the north. Under Option A, only one residence would be located within 200 feet of the pipeline construction, whereas eight residences would be located within 200 feet of construction for the proposed Project. By moving away from the eight residences near the proposed Project and closer to one residence under Option A, there would be a reduced number of residences to evaluate for eligibility for listing on the NRHP or the CRHR.

Option A would move a section of the pipeline farther away from the Herman Richter House. Under the proposed Project, pipeline construction would occur approximately 100 feet south of the Herman Richter House. Under Option A, the pipeline construction would be moved nearly 0.5 mile northeast of the Herman Richter House. Moving the alignment farther from the Herman Richter House under Option A results in a reduced potential impact to cultural/historic resources than the proposed Project. Construction of Option A would occur outside the 1,000-foot wide area surveyed for Line 406, as described in Appendix F-1. Therefore, Option A may impact unknown cultural resources, and cultural resource impacts associated with Option A would be potentially significant (Class II). Implementation of MM CR-1, in association with APM CR-1 through CR-5, would be required to reduce impacts to less than significant.

Impact CR-1: Impact to Unknown Cultural Resources

The project would result in damage to, disruption of or otherwise adversely affect an important archeological or a listed or important historic resource (Potentially Significant, Class II).

MM CR-1 **Alternative Option Pre-Construction Cultural Resource Surveys.** To ensure protection of undiscovered cultural resources, pedestrian field surveys will be conducted for all Alternative Options that were not included in the original field survey efforts. The surveys will be conducted by qualified archaeologists meeting the Secretary of the Interior's Standards and utilizing appropriate transect intervals, typically 15 to 20 meters, walked in a zigzag pattern to ensure complete coverage of the Area of Potential Effects (APE). Previously recorded cultural resources located within or immediately adjacent to the Alternative's APE would be re-located and their current condition described and recorded on Department of Parks and Recreation (DPR) update forms. Any previously unknown cultural resources discovered during the course of the Alternative Options surveys would be evaluated for historic significance and recorded on appropriate DPR forms. In cases where significant impacts would be unavoidable, resource specific, appropriate mitigation would be required.

The potential Cultural Resource impacts of Option A would be greater than under the proposed Project.

Option B

Option B would shift approximately 6.5 miles of pipeline away from numerous residences located along CR-17 to the sparsely populated area to the north. There are no residences located within 200 feet of the pipeline construction under Option B or proposed Project. Therefore, there would be no residences to evaluate for eligibility for listing on the NRHP or the CRHR.

Construction of Option B would occur outside the 1,000-foot-wide area surveyed for Line 406, as described in Appendix F-1. Therefore, Option B may impact unknown cultural resources, and cultural resource impacts associated with Option B would be potentially significant (Class II). Implementation of MM CR-1, in association with

APM CR-1 through CR-5, would be required to reduce impacts to less than significant.

The potential Cultural Resource impacts of Option B would be greater than under the proposed Project.

Option C

Option C would shift approximately 1 mile of pipeline north by approximately 750 feet. There are no residences located within 200 feet of the pipeline construction under Option C or the proposed Project. Therefore, there would be no residences to evaluate for eligibility for listing on the NRHP or the CRHR. Option C was included in the 1,000-foot-wide area surveyed for Line 406.

Option C would result in similar impacts to cultural/historic resources as compared to the proposed Project. Cultural Resource impacts associated with Option C, similar to the proposed Project, would be less than significant (Class III).

Option D

Option D would shift a section of pipeline from bisecting agricultural fields located between CR-17 and CR-19 to the agricultural field boundaries near CR-17. Under Option D, five residences would be located within 200 feet of the pipeline construction, whereas no residences would be located within 200 feet of construction for the proposed Project. By moving toward the five residences near Option D, there would be an increased number of residences to evaluate for eligibility for listing on the NRHP or the CRHR.

Construction of Option D would occur outside the 1,000-foot-wide area surveyed for Line 406, as described in Appendix F-1. Therefore, Option D may impact unknown cultural resources, and cultural resource impacts associated with Option D would be potentially significant (Class II). Implementation of MM CR-1, in association with APM CR-1 through CR-5, would be required to reduce impacts to less than significant.

The potential Cultural Resource impacts associated with Option D would be greater than under the proposed Project.

Option E

Option E would shift a section of pipeline from bisecting agricultural fields located between CR-17 and CR-19 to the agricultural field boundaries near CR-19. Under Option E, three residences would be located within 200 feet of the pipeline construction, whereas no residences would be located within 200 feet of construction for the proposed Project. By moving toward the three residences near Option E, there would be an increased number of residences to evaluate for eligibility for listing on the NRHP or the CRHR.

Construction of Option E would occur outside the 1,000-foot-wide area surveyed for Line 406, as described in Appendix F-1. Therefore, Option E may impact unknown cultural resources, and cultural resource impacts associated with Option E would be potentially significant (Class II). Implementation of MM CR-1, in association with APM CR-1 through CR-5, would be required to reduce impacts to less than significant.

The potential Cultural Resource impacts associated with Option E would be greater than under the proposed Project.

Option F

Option F would shift a portion of the pipeline east by approximately 650 feet. Under Option F, no residences would be located within 200 feet of the pipeline construction, whereas one residence would be located within 200 feet of construction for the proposed Project. By moving away from the residence near the proposed Project, there would be a reduced number of residences to evaluate for eligibility for listing on the NRHP or the CRHR. Option F occurs within the areas previously surveyed for cultural resources.

Potential impacts to cultural/historic resources would be slightly fewer under Option F than for the proposed Project. Cultural Resource impacts associated with Option F, similar to the proposed Project, would be less than significant (Class III).

Option G

Option G would shift a portion of the pipeline south by approximately 240 feet. There are three residences located within 200 feet of Option G and the proposed Project. Therefore, Option G would have the same number of residences to evaluate for eligibility for listing on the NRHP or the CRHR as the proposed Project. In addition, Option G would not lessen potential impacts to an extensive prehistoric resource located north of CR-16A. Option G occurs within the areas previously surveyed for cultural resources.

Option G would have similar potential impacts to cultural/historic resources as the proposed Project. Similar to the proposed Project, Cultural Resource impacts associated with Option G would be less than significant (Class III).

Option H

Option H would shift almost 5.5 miles of pipeline from the more densely populated rural area around Line 407 West to the sparsely populated area to the south. Under Option H, only one residence would be located within 200 feet of the pipeline construction, whereas five residences would be located within 200 feet of construction of the proposed Project. By moving away from four of the five residences near the proposed Project, there would be a reduced number of residences to evaluate for eligibility for listing on the NRHP or the CRHR.

Construction of Option H would occur outside the 600-foot-wide area surveyed for Line 406, as described in Appendix F-2. Therefore, Option H may impact unknown cultural resources, and cultural resource impacts associated with Option H would be potentially significant (Class II). Implementation of MM CR-1, in association with APM CR-1 through CR-5, would be required to reduce impacts to less than significant.

The potential Cultural Resource impacts associated with Option H would be greater than under the proposed Project.

Option I

Option I would shift a portion of the pipeline away from the more densely populated area around Line 407 East along Baseline Road to the sparsely populated area to the north. Under Option I, four residences would be located within 200 feet of the pipeline construction, whereas eight residences would be located within 200 feet of construction for the proposed Project. By moving away from the eight residences near the proposed Project and closer to four residences under Option I, there would be a reduced number of residences to evaluate for eligibility for listing on the NRHP or the CRHR.

Option I would not avoid proximity to three recorded historic-period cultural resources: the Eagle Hotel, Brewer Road, and Country Acres Road (See Appendix

F-6). However, similar to the proposed Project, implementation of APM CR-1, CR-2, and CR-3 would avoid and/or minimize impacts to these resources.

The potential Cultural Resource impacts associated with Option I would be slightly fewer than the proposed Project. Similar to the proposed Project, impacts associated with Option I would be less than significant (Class III).

Option J

Option J would shift a portion of the pipeline away from the more densely populated area around Line 407 East along Baseline Road to the sparsely populated area to the north. Under Option J, six residences would be located within 200 feet of the pipeline construction, whereas eight residences would be located within 200 feet of construction for the proposed Project. By moving away from the eight residences near the proposed Project and closer to six residences under Option J, there would be a reduced number of residences to evaluate for eligibility for listing on the NRHP or the CRHR.

Option J would not avoid proximity to three recorded historic-period cultural resources: the Eagle Hotel, Brewer Road, and Country Acres Road (See Appendix F-6). However, similar to the proposed Project, implementation of APM CR-1, CR-2, and CR-3 would avoid and/or minimize impacts to these resources.

The potential Cultural Resource impacts associated with Option J would be slightly fewer than the proposed project. Similar to the proposed project, impacts associated with Option J would be less than significant (Class III).

Option K

Option K would shift a portion of pipeline from Baseline Road to the open and agricultural fields to the north. Option K is within 150 feet of the proposed Project and is within the study area conducted for previous field surveys and research. There are no residences within 200 feet of Option K or the proposed Project. Therefore, there would be no residences to evaluate for eligibility for listing on the NRHP or the CRHR. According to the review of previous analysis, there are no important cultural resources along Option K (Appendix C-2).

Option K would result in similar impacts to cultural/historic resources as the proposed Project. Cultural Resource impacts associated with Option K, similar to the proposed project, would be less than significant (Class III).

Option L

Option L would follow the proposed alignment for Line 407-E along Base Line Road, but would extend the proposed HDD approximately 1,345 feet to the east. This alternative would increase the depth of cover through the buffer zone to approximately 35 feet and reduce the risk potential to a planned elementary school south of Base Line Road. There are no residences within 200 feet of Option L or the proposed Project. Therefore, there would be no residences to evaluate for eligibility for listing on the NRHP or the CRHR.

Option L would result in similar impacts to cultural/historic resources as the proposed Project. Cultural Resource impacts associated with Option L, similar to the proposed project, would be less than significant (Class III).

Table 4.5-2: Comparison of Alternatives for Cultural Resources

Alternative	Comparison with Proposed Project
No Project	No Impacts
Option A	Greater Impacts
Option B	Greater Impacts
Option C	Similar Impacts
Option D	Greater Impacts
Option E	Greater Impacts
Option F	Slightly Fewer Impacts
Option G	Similar Impacts
Option H	Greater Impacts
Option I	Slightly Fewer Impacts
Option J	Slightly Fewer Impacts
Option K	Similar Impacts
Option L	Similar Impacts
Source: Michael Brandman Associates 2009.	

Paleontological Resources

No Project Alternative

Under the No Project Alternative, no natural gas pipeline would be constructed. As such, there would be no impacts to paleontological resources if the No Project Alternative were selected.

Option A

Option A would encounter the same paleontologically sensitive geologic units and therefore have the same potential to affect significant paleontological resources as the proposed Project. Similar to the proposed project, impacts associated with Option A would be potentially significant (Class II). Implementation of MM PALEO-1 and PALEO-2 would be required to reduce impacts to less than significant.

Option B

Option B would encounter the same paleontologically sensitive geologic units and therefore have the same potential to affect significant paleontological resources as the proposed Project. Similar to the proposed project, impacts associated with Option B would be potentially significant (Class II). Implementation of MM PALEO-1 and PALEO-2 would be required to reduce impacts to less than significant.

Option C

Option C would encounter the same paleontologically sensitive geologic units and therefore have the same potential to affect significant paleontological resources as the proposed Project. Similar to the proposed project, impacts associated with Option C would be potentially significant (Class II). Implementation of MM PALEO-1 and PALEO-2 would be required to reduce impacts to less than significant.

Option D

Option D would encounter the same paleontologically sensitive geologic units and therefore have the same potential to affect significant paleontological resources as the proposed Project. Similar to the proposed project, impacts associated with Option D would be potentially significant (Class II). Implementation of MM PALEO-1 and PALEO-2 would be required to reduce impacts to less than significant.

Option E

Option E would encounter the same paleontologically sensitive geologic units and therefore have the same potential to affect significant paleontological resources as the proposed Project. Similar to the proposed project, impacts associated with Option E would be potentially significant (Class II). Implementation of MM PALEO-1 and PALEO-2 would be required to reduce impacts to less than significant.

Option F

Option F would encounter the same paleontologically sensitive geologic units and therefore have the same potential to affect significant paleontological resources as the proposed Project. Similar to the proposed project, impacts associated with Option F would be potentially significant (Class II). Implementation of MM PALEO-1 and PALEO-2 would be required to reduce impacts to less than significant.

Option G

Option G would encounter the same paleontologically sensitive geologic units and therefore have the same potential to affect significant paleontological resources as the proposed Project. Similar to the proposed project, impacts associated with Option G would be potentially significant (Class II). Implementation of MM PALEO-1 and PALEO-2 would be required to reduce impacts to less than significant.

Option H

Option H would encounter the same paleontologically sensitive geologic units and therefore have the same potential to affect significant paleontological resources as the proposed Project. Similar to the proposed project, impacts associated with Option H would be potentially significant (Class II). Implementation of MM PALEO-1 and PALEO-2 would be required to reduce impacts to less than significant.

Option I

Option I would encounter the same paleontologically sensitive geologic units and therefore have the same potential to affect significant paleontological resources as the proposed Project. Similar to the proposed project, impacts associated with Option I would be potentially significant (Class II). Implementation of MM PALEO-1 and PALEO-2 would be required to reduce impacts to less than significant.

Option J

Option J would encounter the same paleontologically sensitive geologic units and Therefore have the same potential to affect significant paleontological resources as the proposed Project. Similar to the proposed project, impacts associated with Option J would be potentially significant (Class II). Implementation of MM PALEO-1 and PALEO-2 would be required to reduce impacts to less than significant.

Option K

Option K would encounter the same paleontologically sensitive geologic units and therefore have the same potential to affect significant paleontological resources as the proposed Project. Similar to the proposed project, impacts associated with Option K would be potentially significant (Class II). Implementation of MM PALEO-1 and PALEO-2 would be required to reduce impacts to less than significant.

Option L

Option L would encounter the same paleontologically sensitive geologic units and therefore have the same potential to affect significant paleontological resources as the proposed Project. Similar to the proposed project, impacts associated with Option L would be potentially significant (Class II). Implementation of MM PALEO-1 and PALEO-2 would be required to reduce impacts to less than significant.

Table 4.5-3: Comparison of Alternatives for Paleontological Resources

Alternative	Comparison with Proposed Project
No Project	No Impacts
Option A	Similar Impacts
Option B	Similar Impacts
Option C	Similar Impacts
Option D	Similar Impacts
Option E	Similar Impacts
Option F	Similar Impacts
Option G	Similar Impacts
Option H	Similar Impacts
Option I	Similar Impacts

Option J	Similar Impacts
Option K	Similar Impacts
Option L	Similar Impacts
Source: Michael Brandman Associates 2009.	

4.5.7 Cumulative Projects Impact Analysis

Because of the nature of cultural resources, adverse impacts are site specific and generally not affected by cumulative development. Typically, impacts to cultural resources are determined on a project-by-project basis. As described in the sections above, impacts to cultural resources would be mitigated to less than significant levels and are therefore not cumulatively considerable. No cumulative impacts on cultural resources would result from implementation of the Project and no additional mitigation measures would be required.

The potential for encountering paleontological resources during the course of future developments is determined by whether or not paleontological resource bearing strata occur at any given project site and the proposed development activities at that site. In addition, not all paleontological resources have scientific value; some fossil remains are quite common and have little scientific value, while others may be scientifically important due to rarity and/or their ability to provide new information. Therefore, the significance of cumulative impacts to paleontological resources is not necessarily determined by the frequency of the impact but by the nature of the impact and the significance of the fossil. Additionally, an impact to a paleontological resource may not always be adverse. With appropriate mitigation, an impact may lead to recovery of scientifically important fossil remains that would not have been discovered otherwise. Therefore, it is not anticipated that there would be a significant adverse cumulative impact to paleontological resources.

4.5.8 Summary of Impacts and Mitigation Measures

The impacts to cultural resources resulting from Project development would be less than significant with implementation of the Applicant Proposed Measures. Therefore the proposed Project does not require mitigation measures for cultural resources.

The Project could adversely impact significant paleontological resources. Paleontological monitoring of earth-disturbing activities, fossil salvage, preliminary preparation, and documentation of collected fossils, and transfer of the collection to an accredited repository is recommended as mitigation necessary to reduce any potential impacts to a less than significant level.

For paleontological resources, under criterion 1, Project construction or operation would result in damage or loss of vertebrate or invertebrate fossils that are considered important by paleontologists and land management agency staff. Implementation of MM Paleo-1 would reduce the impact to a less than significant level. For paleontological resources, under criterion 2, the Project is considered to be a resource having scientific or educational value. Implementation of MM Paleo-2 would reduce the impact to a less than significant level.

Implementation of Option A, Option B, Option D, Option E, or Option H would result in potentially significant impacts (Class II) to cultural resources and, in addition to MM Paleo-1 and MM Paleo-2, would require implementation of MM CR-1 in order to reduce impacts to less than significant (Class III).

Table 4.5-4: Summary of Paleontological Resources Impacts and Mitigation Measures

Impact	Mitigation Measure
PALEO-1. Fossils.	**PALEO-1.** Proper curation of fossil collection.
PALEO-2. Scientific or educational value.	**PALEO-2.** Delivery of fossil collection to appropriate location.
CR-1. Impact to Unknown Cultural Resource.	**CR-1.** Alternative option pre-construction cultural resource surveys.
Source: Michael Brandman Associates 2009.	

4.6 GEOLOGY AND SOILS

This Section describes the existing geology and soil setting and potential effects from Project implementation on the pipeline alignment and the surrounding area. Descriptions and analysis in this Section are based on information contained in the Geological Technical Study dated September 25, 2008, which was prepared by Ninyo & Moore and included in this document as Appendix G.

4.6.1 Environmental Setting

Topography

The Project area transects the Sacramento Valley from just north of the town of Esparto in the west to the City of Roseville in the east. The western end of the Project area begins in the alluvial plain just below the Rumsey Hills, which are an extension of the Coast Range. The Project alignment crosses the flat Hungry Hollow Basin and extends through the Dunnigan Hills. In the Project area, the Dunnigan Hills rise gently on the west side of the hills, and drop off much more steeply in the east. The east side of the Dunnigan Hills has significant topographic relief, including undulating, steep hill slopes to nearly 50 degrees with incised stream valleys. The Dunnigan Hills end abruptly in the fluvial basin of the Sacramento Valley. The remainder of the Project area is in the Sacramento Valley, with the eastern few miles in the gentle rise of the lower Sierran foothills. Elevations in the Hungry Hollow are consistently near 175 feet above mean sea level. In the Dunnigan Hills portion of the Project area, the maximum elevation is slightly more than 250 feet. Through the Sacramento Valley, elevations range from 25 to 75 feet, rising to 125 feet at the eastern terminus of the Project alignment.

The Project alignment either crosses or comes close to several significant water bodies. In the western portion of the Project area just east of the town of Yolo, the alignment is within 1 mile of Cache Creek, a perennial stream with significant flow during the rainy season. Further east, the alignment crosses Knights Landing Ridge Cut, a significant flood-control canal; the Yolo Bypass, a significant flood-control structure; and the Sacramento River. Throughout the Project area, the alignment crosses numerous small streams, irrigation canals, and drainage canals. Many of these steep-banked streams and canals approach depths of 5 to 8 feet.

Regional Setting

The Project area is located in the Great Valley province, a northwest-trending asymmetrical structural basin bounded by Sierra Nevada province to the east and south, the Klamath Mountains to the north, the Cascade Range province to the northeast, and the Coast Ranges province to the west. The Great Valley is comprised of the Sacramento Valley to the north and the San Joaquin Valley to the south and is a nearly flat alluvial plain extending for about 450 miles from the Klamath Mountains south to the Tehachapi Mountains. The northerly portion of the Great Valley, the Sacramento Valley, is drained by the southerly flowing Sacramento River, whereas the San Joaquin River flows to the north draining the San Joaquin Valley. Both rivers ultimately empty into the San Francisco Bay.

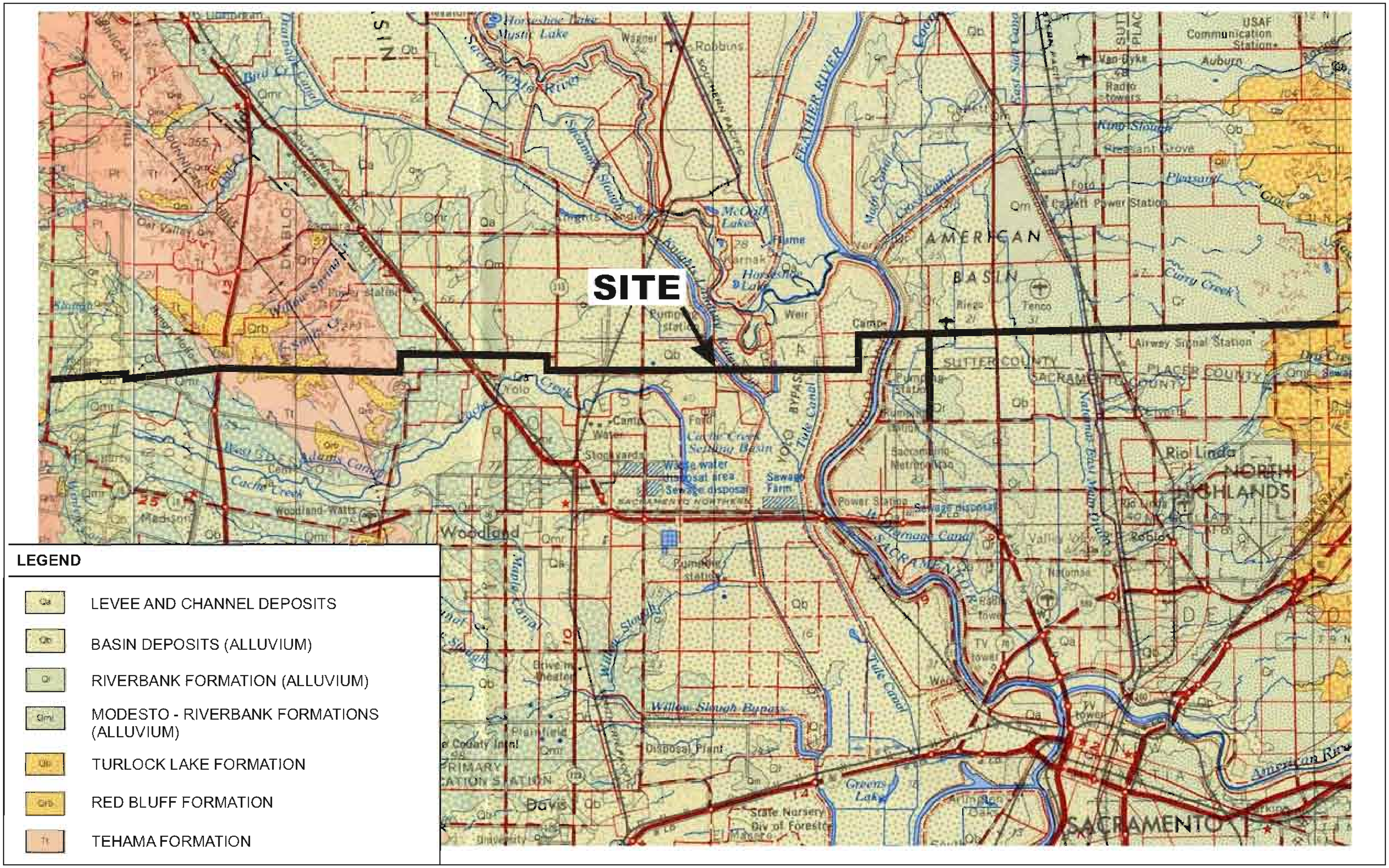
In broadest view, the Great Valley is a vast syncline filled with many thousands of feet of alluvial and fluvial sedimentary deposits of Jurassic to Recent age (the Great Valley Sequence). The sedimentary trough has a long stable eastern shelf supported by the subsurface continuation of the granitic Sierran slope and a short western flank expressed by the upturned edges of the basin sediments. Elevations of the alluvial plain are generally just a few hundred feet above sea level, with extremes ranging from a few feet below sea level to about 1,000 feet above. The only prominent topographic feature within the central part of the valley is Marysville (Sutter) Buttes, a Pliocene volcanic plug, which rises abruptly 2,000 feet above the surrounding valley floor. The study area is located in the southerly portion of the Sacramento Valley of the Great Valley.

Project Area Geology

The Project area is underlain generally by artificial fill, and Recent age natural surficial deposits of alluvium and basin deposits. In addition, formational units are present along the alignment including the Pleistocene-age Modesto, Turlock Lake, and Red Bluff Formations and Pliocene-age Tehama Formation. Geology in the Project area is shown on Figure 4.6-1. The unit descriptions are listed below:

Artificial Fill

Areas of human made fill are present along the proposed alignment. These soils occur in areas of existing improvements such as roads, levees, and buried utilities. Agricultural fill occurs as plowed topsoil in the agricultural fields. In general, the fill soils are expected to be relatively thin and derived primarily or entirely from the on-site soils. However, thicker fill soils can be expected in the earthen levees present along watercourses.



Source: Ninyo & Moore 2009.

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NORTH

0 1 2 4 Miles

Figure 4.6-1
Geology in the Project Region

Alluvium and Basin Deposits

Holocene or Recent age (within the last 11,000 years) alluvium and basin deposits have been mapped as underlying central portions of the pipeline alignment. The alluvium is the result of deposition of the Sacramento River, Cache Creek, and other river systems and typically consists of unconsolidated sand and silt. During the gold rush the base elevation of the Sacramento River was elevated by inflow of sands and gravels from upstream mine waste deposited over the then existing river bed sands and gravels. This rise in river level resulted in the construction of levees to protect the area from flooding. The resultant land use obscures the location of most past riverbed deposits; one of which went through what is now downtown Sacramento, out and past Southside Park, which still contains a lake that was an ancestral Sacramento River bed. The basin deposits were deposited in somewhat lower-energy depositional environments and consequently consist of finer-grained materials such as silts and clays. The basin deposits are interbedded with alluvial deposits. Other alluvial deposits crossing the alignment have been documented as riverbank and buried stream channel deposits, which include relatively permeable sands and gravels encased in less permeable silts and clays.

Modesto Formation

Materials of the late Pleistocene-age (12,000 to 43,000 years old) Modesto Formation are exposed in the western and eastern portions of the alignment. This formation is divided into an upper and lower member. The lower member of the Modesto Formation consists of slightly weathered gravel, sand, silt, and clay. The lower member is widespread and surrounds much of the Dunnigan Hills and Cache Creek. This unit is fluvial in nature and has almost no topographic relief. A linear feature created by the displacement of this unit extends to within less then 2 miles of the Project area. This linear structure may represent fault displacement along the Dunnigan Hills Fault that has been covered by modern sediments. The lower member of the Modesto Formation is the youngest unit in which there is evidence of possible fault displacement. The upper member of the Modesto Formation consists of unweathered gravel, sand, silt, and clay. The upper member is generally only a few feet thick, with poorly developed soil profiles having no B horizon (generally defined as the subsoil and the layer where clay concentrations may occur), and located on the lowest terrace level adjacent to modern streams and in incised alluvial fans.

Turlock Lake Formation

Materials of the Pleistocene-age (greater than 0.7 million years old) Turlock Lake Formation are exposed on the eastern end of the proposed alignment. This formation primarily represents eroded Pleistocene-age alluvial fans, and is found on terraces above the grade of modern streams. The Turlock Lake Formation typically consists of hard, cemented yellow brown silts and red brown sands with occasional gravel and clay beds.

Red Bluff Formation

In the westerly portion of the alignment, the Red Bluff Formation occurs throughout the Dunnigan Hills mostly along ridge tops. The Pleistocene-age (greater than 0.7 million years old) unit consists of distinct bright red to orange clayey gravels and cobbles in a silty or sandy matrix. The Red Bluff Formation overlies the Tehama Formation, which is described below.

Tehama Formation

The Tehama Formation occurs at the far west end of the alignment and throughout the Dunnigan Hills. Volcanoclastic rocks of non-marine origin make up this formation. The Tehama Formation is Pliocene in age (1.6 to 5 million years old) and is composed predominantly of cemented sand and silt with varying amounts of gravel and minor clay.

Soils

Soils are the byproduct of physical and chemical weathering of rock and sediments. They consist of mineral and organic matter created through physical, chemical, and biological processes. The Natural Resources Conservation Service (NRCS) prepares and maintains soil surveys that classify soil characteristics and their suitability for agriculture and development.

Because published soil descriptions are focused primarily on agricultural needs and are limited to a depth of 5 to 6 feet, they do not provide information on deeper conditions. In the Project area, landfilling, highway and street construction, and flood-control structures may have caused substantial changes to native soil profiles. Therefore, soil conditions in developed area may differ significantly from mapped conditions and may be highly variable.

Soil properties of particular interest include shrink-swell, erosion, and corrosion potential, as these properties may impact Project facilities. In addition, the relative density or consistency of the soil, which can also be highly variable across a site, can also impact Project facilities. In particular, the presence of soft or loose soils, shallow groundwater, and shallow bedrock may impact design parameters and construction methods.

Fifty-four individual soil units, including combinations of one or more distinct soil types and slope conditions, are mapped by the NRCS in the Project area. Mapped soil units in the Project Area are provided in Figures 4.6-2A, 4.6-2B, and 4.6-2C, and their relevant properties are shown on Table 4.6-1.

Shallow Soils

Mapped soil units that are indicated to have thin (shallow) soils over bedrock (i.e., less than 6 feet) include:

- [104] Alamo-Fiddyment complex, depth to hard bedrock less than 40 inches;
- [BaE2] Balcom silty clay loam, depth to bedrock 20 to 40 inches;
- [141] Cometa-Fiddyment complex, depth to bedrock 20 to 40 inches;
- [SkD and SkF2] Sehorn clay, depth to (soft) bedrock 20 to 40 inches;
- [SID] Shehorn cobbly clay, depth to (soft) bedrock 20 to 40 inches;
- [SmD, SmE2, and SmF2] Sehorn-Balcom complex, depth to (soft) bedrock 20 to 40 inches; and
- [Wn] Willows clay, marly variant, saline alkali.

Soils that are shallow to bedrock are found along Line 406 throughout the Dunnigan Hills along County Road (CR) 17 from roughly Interstate (I) 505 to CR-95A and in selected areas along the eastern 8 miles of Line 407, east of Pleasant Grove Road. Other soils along the alignment are sufficiently deep, and it is unlikely that bedrock would be encountered during construction.

Expansive Soils

Expansive soils are those that shrink and swell significantly as the soil dries and wets, respectively. Fifty-two of the 54 soil units in the Project area have been rated for shrink/swell potential and are described as having a moderate to high shrink/swell potential. Only sandy/gravelly streambed deposits are identified as having low shrink/swell potential.

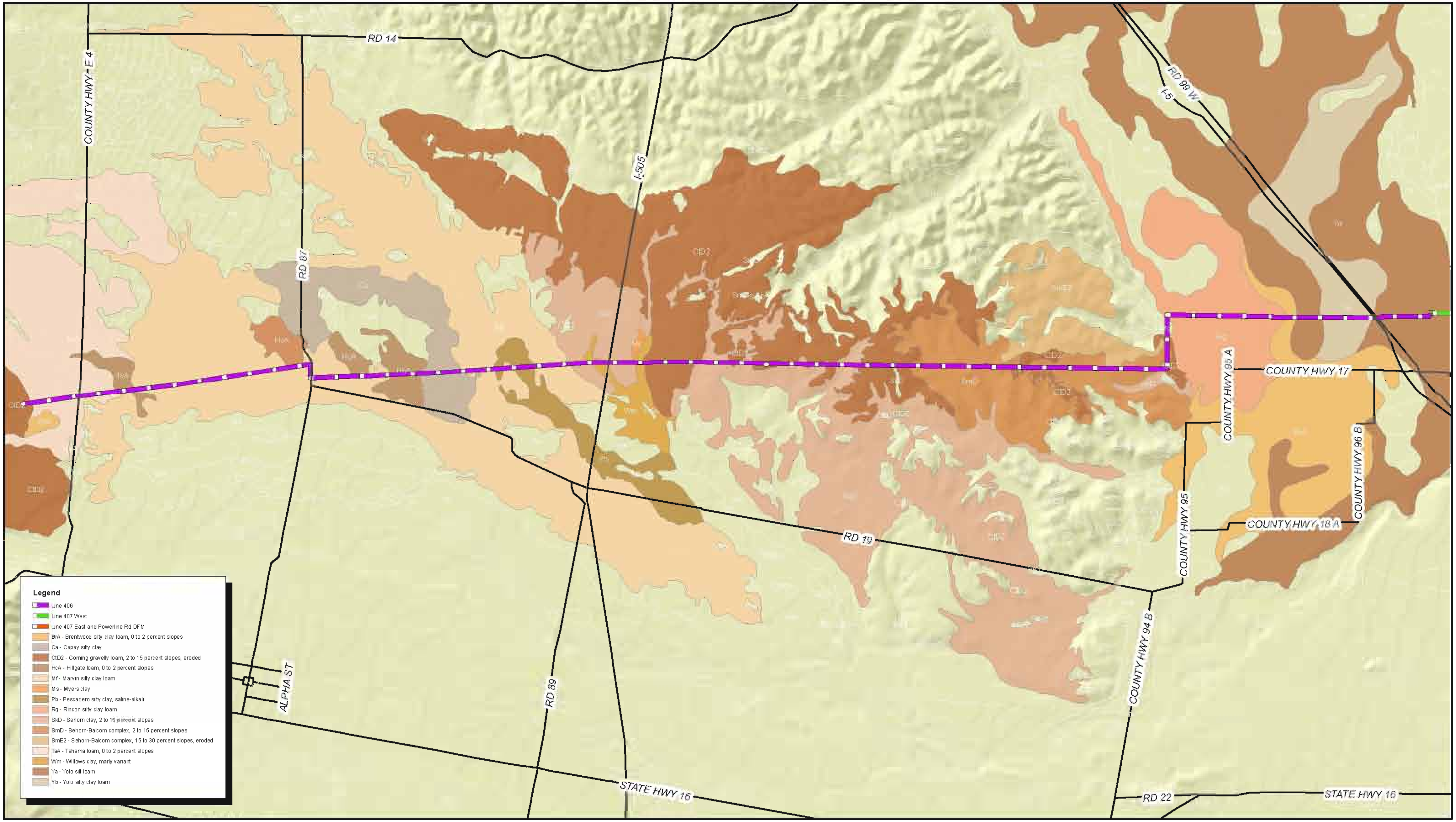
Flooded or Water-Logged Soils

Some soil types are characterized by periodic flooding or seasonal saturation in the near surface horizons. Soils with periodic flooding or seasonal saturation represent a special challenge for construction and include the following eight soil-mapping units:

- [Ck] Clear Lake clay;
- [Mf] Marvin silty clay loam;
- [146] Neuva loam, flooded;
- [Rh] Riverwash;
- [Sv] Sycamore complex, drained;
- [Sw] Sycamore complex, flooded;
- [Sr] Sycamore complex, silt loam, flooded; and
- [195] Xerofluvents (i.e., ephermeral stream-bed deposits), flooded.

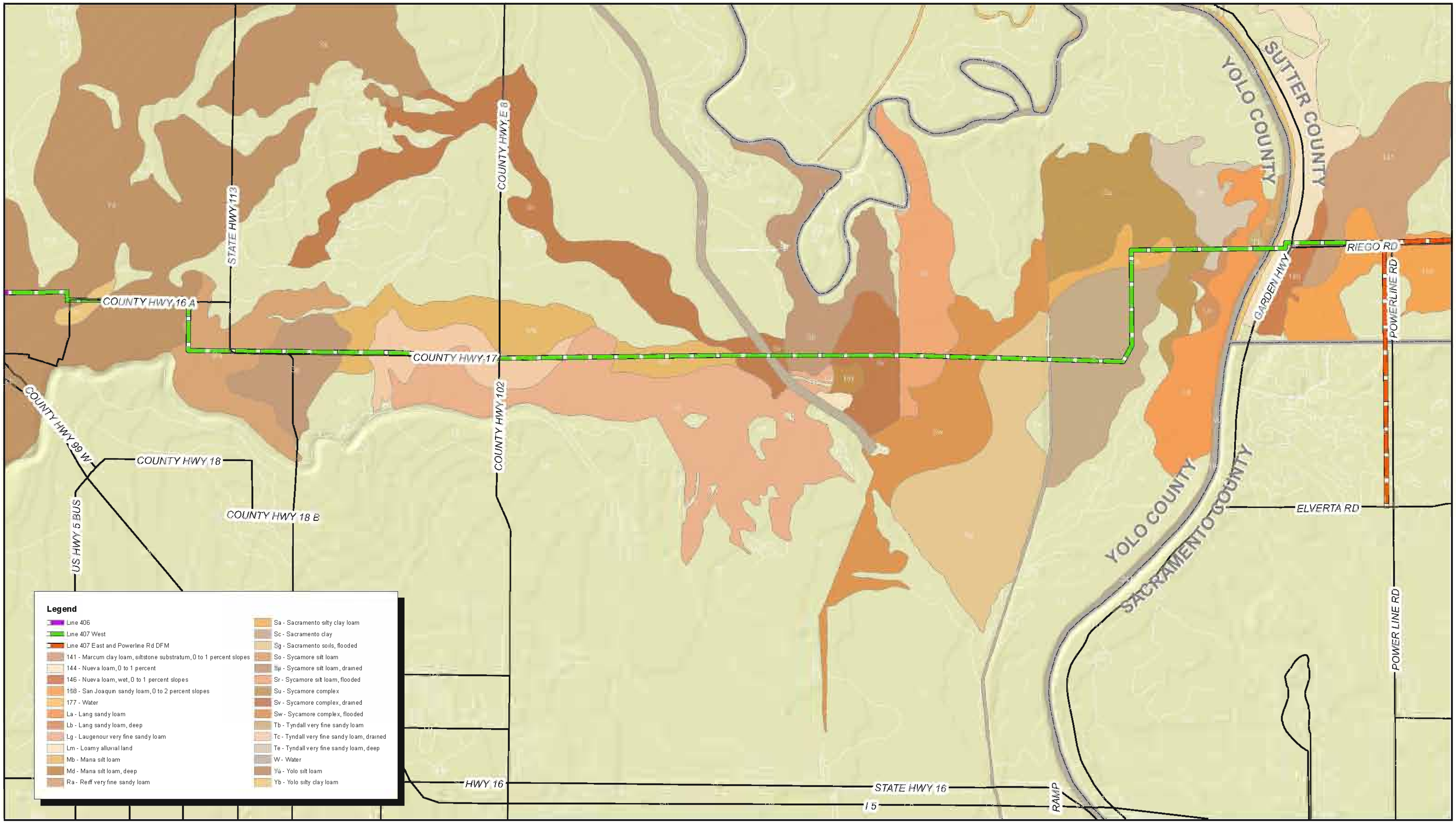
Portions of the Project area that may be associated with flooded or saturated soils include the following areas, from west to east:

- Portions of Hungry Hollow between CR-85 and just west of CR-87 (western end of Line 406);
- Most of the Line 407 Project area in the vicinity of the Knights Landing Ridge Cut to approximately 4 miles east of the Sacramento River (flooded rice farming occurs east of the Sacramento River);
- Isolated locations throughout the Line 406 and Line 407 alignments where irrigation and drainage canals and streams cross the alignment; and
- Isolated locations within the Dunnigan Hills where seasonal runoff may collect.



Source: California Resource Agency and PG&E 2008.

Figure 4.6-2A
Soils Along the Proposed Project



Source: California Resource Agency and PG&E 2008.

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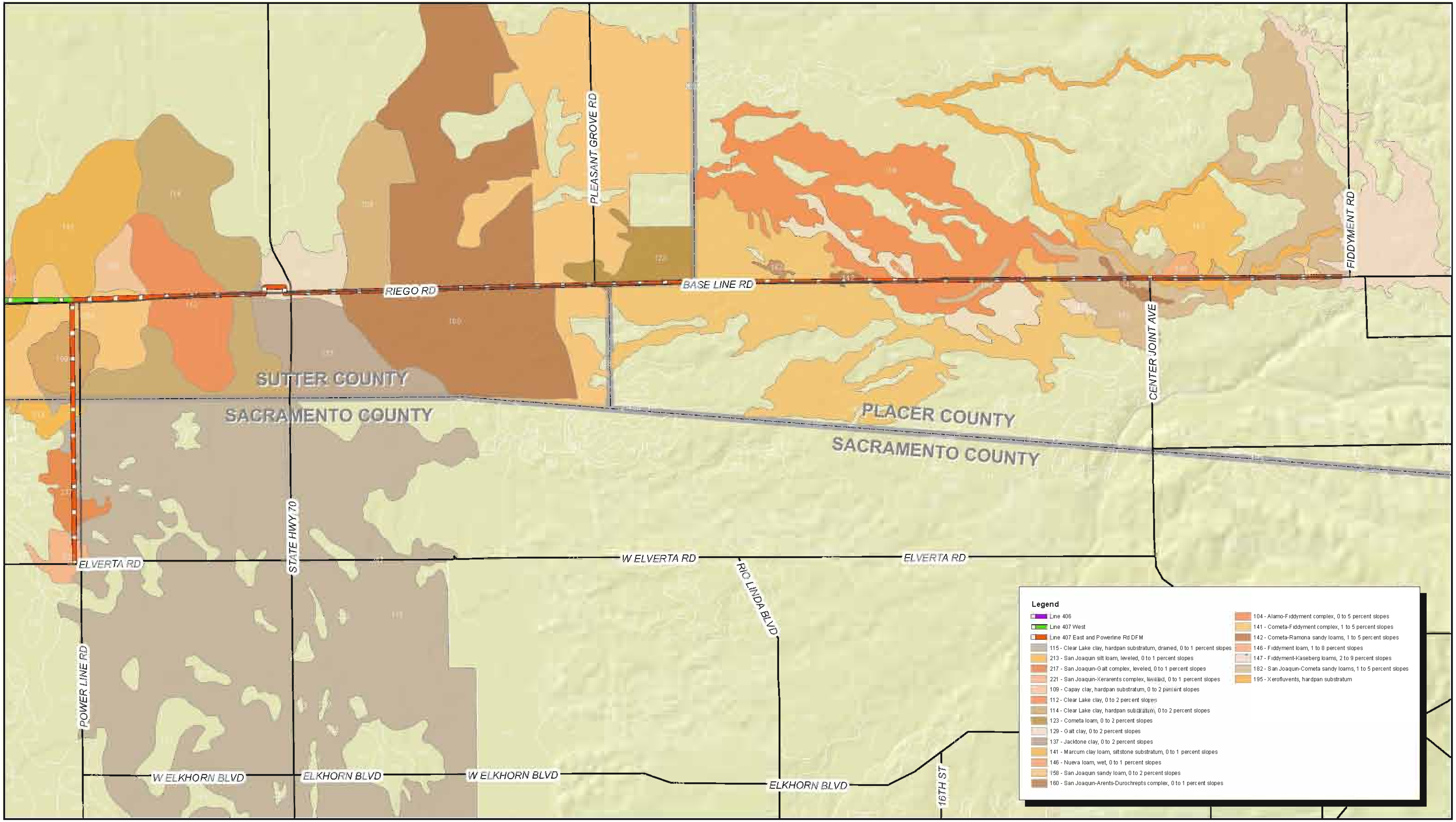
NORTH

4,500 2,250 0 4,500 Feet

Figure 4.6-2B
Soils Along the Proposed Project



Source: California Resource Agency and PG&E 2008.

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Figure 4.6-2C
Soils Along the Proposed Project

Table 4.6-1: Soils in the Project Area

Name	Map Symbol	Percent Slope	Shrink-Swell Potential[1]	Erosion Potential[2]	Depth to Bedrock[3] (ft bgs)[4]	Nature of Bedrock[3]	Depth to Water[5] (ft bgs)	Corrosion Potential (Steel)
Alamo-Fiddyment complex	104	0 to 5	High		Less than 3	Hard		High
Balcom silty clay loam	BaE2	15 to 30	High	Moderate	1.5 to 3	Not rated		Not rated
Brentwood silty clay loam	BrA	0 to 2	High					High
Capay clay, hardpan substratum	109	0 to 2	High					High
Capay silty clay	Ca	0 to 1	High					High
Clear Lake clay	Ck, 112, and 115	0 to 2	High					High
Clear Lake clay, hardpan	114	0 to 2	High				2.5 to 6	High
Cometa-Fiddyment complex	141	1 to 5	High		1.5 to 3	Soft		High
Cometa-Fiddyment sandy loam	142	1 to 5	High					High
Cometa loam	123	0 to 2	High					Moderate
Corning gravelly loam	CtD2	2 to 15	High					High
Corning gravelly loam	CtE2	15 to 30	High	Moderate				High
Marcum clay loam, siltstone substratum	141	0 to 1	Moderate				1.5 to 2.5	High
Galt clay	129	0 to 2	High					High

Name	Map Symbol	Percent Slope	Shrink-Swell Potential[1]	Erosion Potential[2]	Depth to Bedrock[3] (ft bgs)[4]	Nature of Bedrock[3]	Depth to Water[5] (ft bgs)	Corrosion Potential (Steel)
Hillgate loam	HcA and HdA	0 to 2	Moderate					Moderate
Hillgate loam	HcC and HcC2	2 to 9	Moderate					Moderate
Marvin silty clay loam	Mf	0 to 1	High					High
Lang sandy loam, deep	Lb	0 to 1	High				2.5 to 6	High
Laugenour very fine sandy loam	Lg	0 to 1	Not rated				2.5 to 6	High
Loamy alluvial land, undifferentiated	Lm	Varies	High				2.5 to 6	High
Maria silt loam	Mb	0 to 1	Moderate					High
Maria silt loam, deep	Md	0 to 1	Moderate					High
Myers clay	Ms	0 to 1	High					High
Nueva loam	144	0 to 1	High				2.5 to 6	High
Nueva loam, wet	146	0 to 1	High				2.5 to 6	High
Pescadero silty clay	Pb	0 to 1	High				1.5 to 2.5	High
Reiff very fine sandy loam	Ra	0 to 1	Not rated					High
Rincon silty clay	Rg	0 to 1	High					High
Riverwash	Rh	Not rated	Low					Low

Name	Map Symbol	Percent Slope	Shrink-Swell Potential[1]	Erosion Potential[2]	Depth to Bedrock[3] (ft bgs)[4]	Nature of Bedrock[3]	Depth to Water[5] (ft bgs)	Corrosion Potential (Steel)
Sacramento clay, drained	Sd	0 to 1	High					High
Sacramento soils, undifferentiated	Sg	0 to 1	High					High
San Joaquin - Cometa sandy loam	182	1 to 5	High		2.5 to 5	Not rated		High
San Joaquin sandy loam	158	0 to 2	Not rated		1.5 to 3.5	Not rated		Moderate
San Joaquin sandy loam	181	1 to 5	High		2.5 to 5	Not rated		High
San Joaquin-Arents-Durochrepts complex	160	0 to 1	Not rated		1.5 to 3.5	Not rated		Moderate
Sehorn clay	SkD	2 to 15	High		1.5 to 3	Soft		High
Sehorn clay	SkF2	30 to 50	High	High	1.5 to 3	Soft		High
Sehorn cobbly clay	SlD	2 to 15	High		1.5 to 3	Soft		High
Sehorn-Balcom complex	SmD	2 to 15	High		1.5 to 3	Soft		High
Sehorn-Balcom complex	SmE2	15 to 30	High	Moderate	1.5 to 3	Soft		High
Sehorn-Balcom complex	SmF2	30 to 50	High	High				High
Soboba gravelly clay loam	Sn	0 to 1	Low					Moderate
Sycamore complex, silt loam	Sp	0 to 1	Moderate				2.5 to 6	High
Sycamore complex, silt loam, flooded	Sr	0 to 1	Moderate				2.5 to 6	High

Name	Map Symbol	Percent Slope	Shrink-Swell Potential[1]	Erosion Potential[2]	Depth to Bedrock[3] (ft bgs)[4]	Nature of Bedrock[3]	Depth to Water[5] (ft bgs)	Corrosion Potential (Steel)
Sycamore complex silty clay loam	Ss	0 to 1	Moderate				2.5 to 6	High
Sycamore complex	Su	0 to 1	Moderate					High
Sycamore complex	Sv	0 to 1	Moderate				2.5 to 6	High
Sycamore complex	Sw	0 to 1	Moderate				2.5 to 6	High
Tehama loam	TaA	0 to 2	Moderate					Moderate
Tyndall very fine sandy loam	Td	0 to 1	High				2.5 to 6	High
Willows clay	Wm and Wn	0 to 1	High				2.5 to 6	High
Xerofluvents, hardpan	195	Varies	Low					High
Yolo silt loam	Ya	0 to 1	Moderate					High
Yolo silty clay loam	Yb	0 to 1	Moderate					High

Notes:
[1] Based on Linear Expansivity Potential. [2] Estimated from slope. Soil with minimum slope not rated. [3] Depth to bedrock provided. [4] ft bgs = feet below ground surface.
[5] Depth to groundwater provided when noted in soil survey. Depth to water not provided if typically greater than 6 ft bgs.
Source: PG&E 2007.

Seismicity

The term seismicity describes the effects of seismic waves that radiate from an earthquake as it occurs. While most of the energy released during an earthquake results in the permanent displacement of the ground, as much as 10 percent of the energy may dissipate immediately in the form of seismic waves. To understand the implications of seismic events, a discussion of faulting and seismic hazards is provided below.

Faulting

Faults form in rocks when stresses overcome the internal strength of the rock, resulting in a fracture. Large faults develop in response to large regional stresses operating over a long time, such as those stresses caused by the relative displacement between tectonic plates. According to the elastic rebound theory, these stresses cause strain to build up in the earth's curst until enough strain has built up to exceed the strength along a fault and case a brittle fracture. The slip between the two stuck plates or coherent blocks generates an earthquake. Following an earthquake, strain will build once again until the occurrence of another earthquake. The magnitude of slip is related to the maximum allowable strain that can be built up along a particular fault segment. The greatest buildup in strain due to the largest relative motion between tectonic plates or fault blocks over the longest period will generally produce the largest earthquakes. The distribution of these earthquakes is a study of much interest for both hazard prediction and the study of active deformation of the earth's crust. Deformation is a complex process and strain caused by tectonic forces is not only accommodated through faulting, but also by folding, uplift, and subsidence, which can be gradual or in direct response to earthquakes.

Faults are mapped to determine earthquake hazards, since they occur where earthquakes tend to recur. A historic plane of weakness is more likely to fail under stress and strain than a previously unbroken block of crust. Faults are, therefore, a prime indicator of past seismic activity, and faults with recent activity are presumed to be the best candidates for future earthquakes. However, since slip is not always accommodated by faults that intersect the surface along traces, and since the orientation of stress and strain in the crust can shift, predicting the location of future earthquakes is complicated. Earthquakes sometimes occur in area with previously undetected faults or along faults previously thought inactive.

<u>Local Faulting</u>

Based on the tectonic setting and the historical record, the Project area is in a region that is characterized by a relatively low to moderate seismicity. Historical earthquakes of magnitude 6.0 or greater with epicenters within approximately 62 miles (100 km) of the Project Area are shown in Table 4.6-2.

Table 4.6-2: Historical Earthquakes in the Study Area

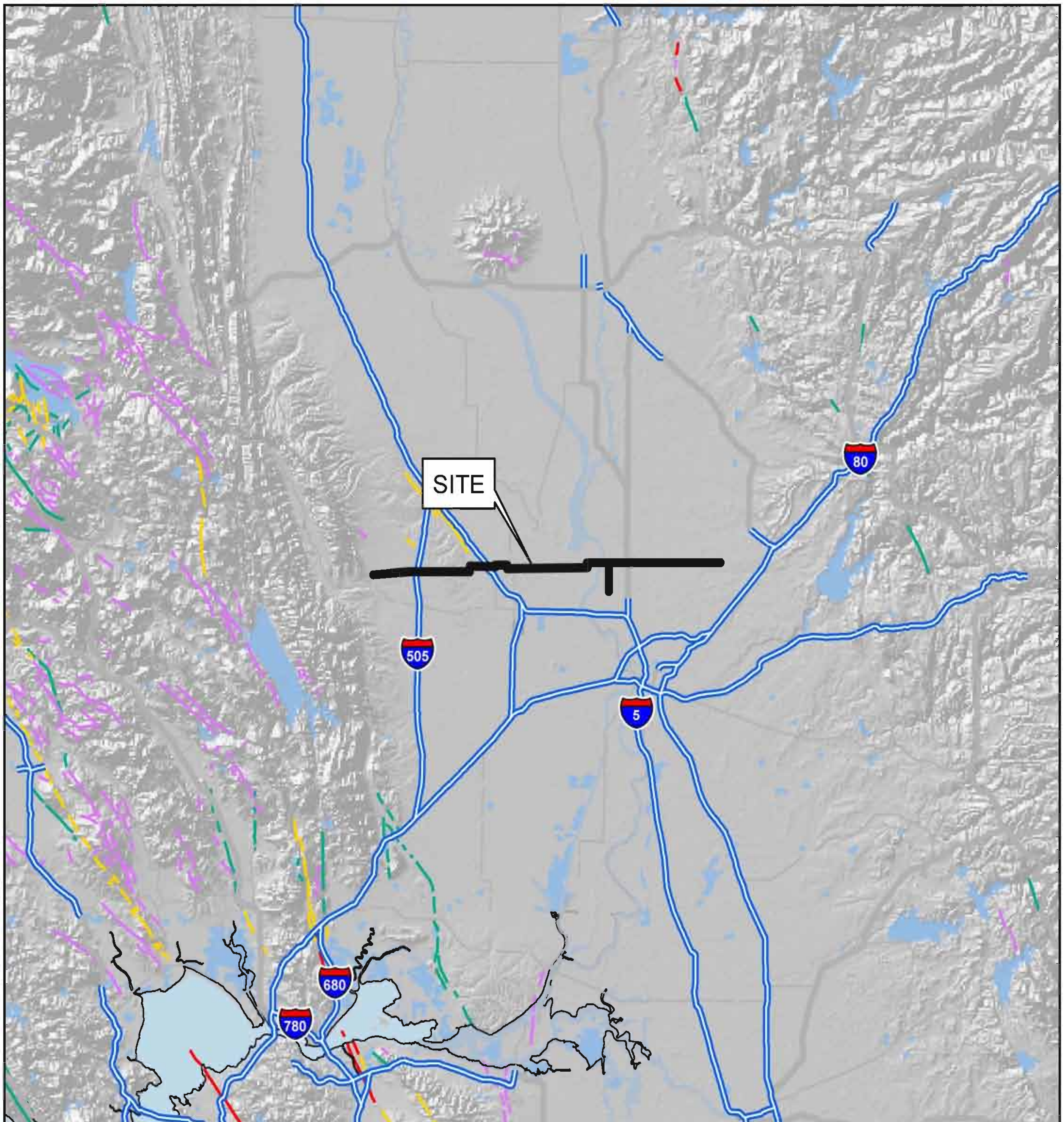
Date	Magnitude	Fault
5/19/1889	6.0	Great Valley fault system
4/19/1892	6.4	Great Valley fault system
4/21/1892	6.2	Great Valley fault system
3/31/1898	6.2	Unknown

Notes: The event in 1898 occurred in a northeastern part of the San Francisco Bay area, but the fault or fault system is unkown.
Source: PG&E 2007

Figure 4.6-3 shows fault location map for the region.

The pipeline alignment crosses three documented faults: the Great Valley, Dunnigan Hills, and Willows faults. The three faults are thought to exist at depth and do not reach the surface where they cross the proposed alignment (Kleinfelder 2007). The Great Valley fault is mapped near the westerly end of the alignment; the Dunnigan Hills fault is along the northeasterly side of the Dunnigan Hills, west of I-5; and the Willows fault is in the easterly portion of the alignment between the Sacramento River and the City of Roseville.

Great Valley Fault. The Great Valley fault is actually an extensive system of northerly-trending, westerly-dipping (inclined) thrust faults along the westerly margin of the Sacramento and San Joaquin valleys of the Great Valley. The faults have been referred to as “blind thrusts” because they occur at depth and do not intercept the ground surface; therefore, they are not considered to have the potential for ground surface rupture or subsequently, pipeline rupture. The fault system is considered to be a seismic source that could result in strong ground motions. The pipeline alignment crosses Segment 3 of the fault system which could generate an earthquake of magnitude 6.9.



LEGEND

FAULT ACTIVITY:

- HISTORICALLY ACTIVE
- HOLOCENE ACTIVE
- LATE QUATERNARY (POTENTIALLY ACTIVE)
- QUATERNARY (POTENTIALLY ACTIVE)

Source: Ninyo & Moore 2008.

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15 7.5 0 15 Miles

Figure 4.6-3
Faults in the Project Region

Willows Fault. Surface expression of the Willows fault is not apparent. The Willows fault trace location is based largely on a linear differential of measured groundwater levels. The fault is designated as pre-Quaternary in age and is not considered active or “potentially active.” The fault is not considered a significant seismic source, nor is it considered capable of resulting in ground surface rupture.

Dunnigan Hills Fault. The Dunnigan Hills fault is considered to be a zone of discontinuous total lineaments near the base of the northeast-facing escarpment of the Dunnigan Hills. Similar to the Great Valley Fault, the Dunnigan Hills fault is classified as a blind thrust fault and is believed to exist at depth.

In 1982, the California Division of Mines and Geology (now called the CGS) performed a fault evaluation of the Dunnigan Hills fault as part of the Alquist Priolo fault zoning program and concluded that the fault did not meet the criteria of sufficiently active and well-defined and, therefore, was not designated as an Earthquake Fault (Alquist-Priolo) Zone. However, the Dunnigan Hills fault shows evidence of Holocene displacement (movement during the last 11,000 years), and there is evidence of surface rupture north of the proposed alignment near the town of Zamora; however, the fault becomes buried in the vicinity of the alignment (Kleinfelder 2007).

Based on a probabilistic seismic hazard model for California (USGS/CGS, 2002) peak horizontal ground accelerations having a 10 percent probability of exceedance in 50 years can be estimated to be about 0.4g (40 percent of gravity) at the west end of the alignment and about 0.2g at the east end of the alignment. This can be compared with potential ground accelerations having the same probability of occurrence of in excess of 0.7g in the San Francisco Bay Area. No portions of the pipeline alignment are in State of California-designated Earthquake Fault Zones which are areas that have a relatively high potential ground surface rupture due to faults. Table 4-6.3 lists active faults within approximately 62 miles (100 km) of the central portion of the pipeline alignment.

Table 4.6-3: Principal Active Faults

Fault	Distance (miles)[1]	Maximum Moment Magnitude[2]
Great Valley Segment 3	16	6.9
Great Valley Segment 4	19	6.6

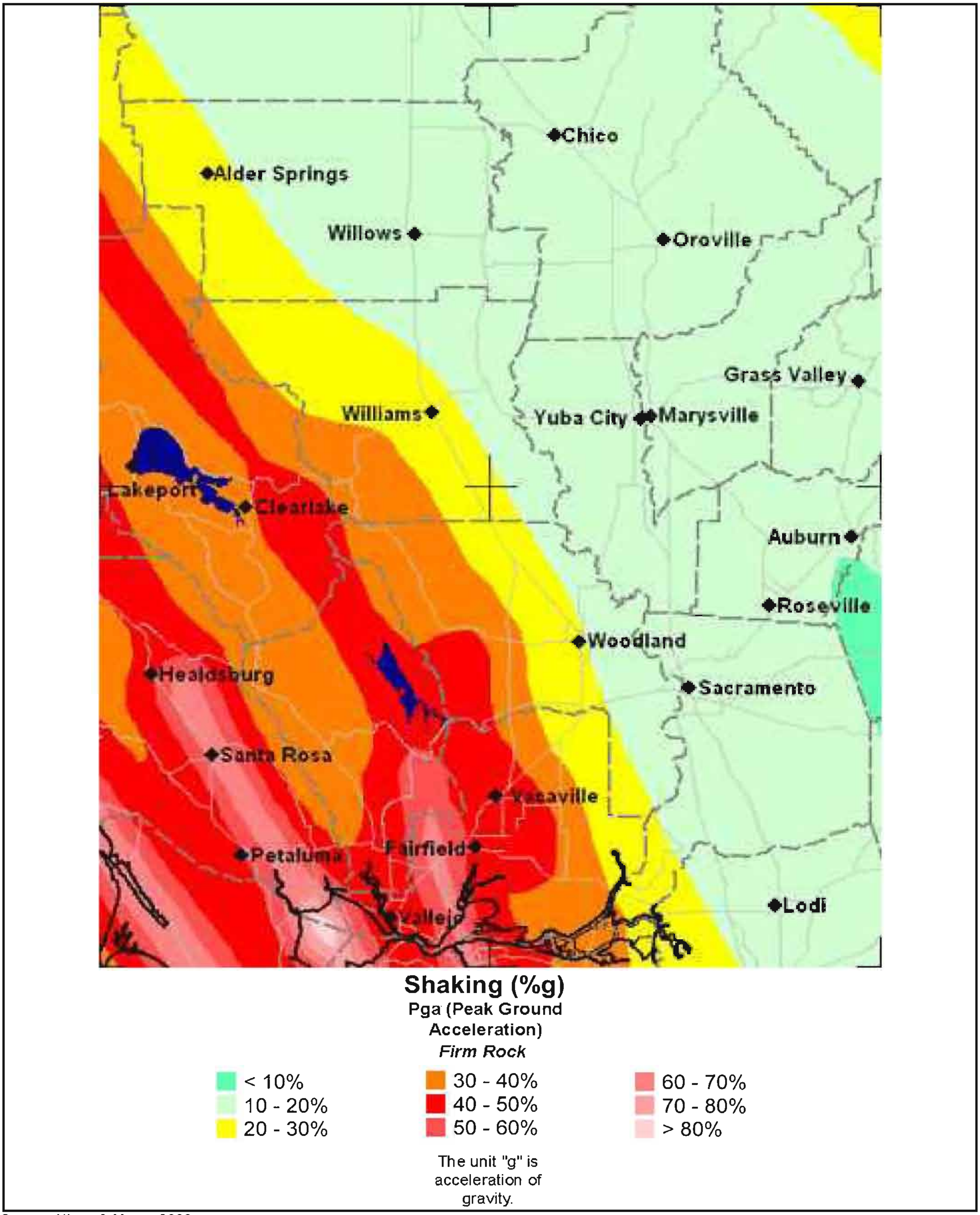
Fault	Distance (miles)[1]	Maximum Moment Magnitude[2]
Foothills	30	6.5
Great Valley Segment 5	32	6.5
Hunting-Creek-Berryessa	32	7.1
Concord	35	6.7
Great Valley Segment 2	39	6.4
West Napa	42	6.5
Bartlett Springs	45	7.6
Great Valley Segment 1	48	6.7
Callayomi	52	6.5
Maacama	54	7.5
Hayward	56	7.1

Notes
[1]Blake (2001)
[2]The reported potential maximum magnitudes are Maximum Moment Magnitudes rather than Richter Scale Magnitudes, a scale that is generally no longer used.
Source: PG&E 2007.

Figure 4.6-4 shows the potential ground accelerations in the regions having a 10 percent probability of being exceeded in 50 years.

Seismic Hazards

Seismic hazards pose a substantial danger to property and human safety and are present because of the risk of naturally occurring geologic events and processes impacting human development. Therefore, the hazard is as influenced by the conditions of human development as by the frequency and distribution of major geologic events. Seismic hazards present in California include ground rupture along faults, strong seismic shaking, liquefaction, ground failure, landsliding, and slope failure.



Source: Ninyo & Moore 2008.

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NOT TO SCALE

Figure 4.6-4
Peak Ground Acceleration
10 Percent of Being Exceeded in 50 Years

Fault Rupture

Fault rupture is a seismic hazard that affects structures sited above an active fault. The hazard from fault rupture is the movement of the ground surface along a fault during an earthquake. Typically, this movement takes place during the short time of an earthquake, but can also occur slowly over many years in a process known as creep. Most structures and underground utilities cannot accommodate the surface displacements of several inches to several feet commonly associated with fault rupture or creep.

Ground Shaking

The severity of ground shaking depends on several variables such as earthquake magnitude, epicenter distance, local geology, thickness and seismic wave-propagation properties of unconsolidated materials, groundwater conditions, and topographic setting. Ground shaking hazards are most pronounced in areas near faults or with unconsolidated alluvium.

The most common type of damage from ground shaking is structural damage to buildings. However, strong ground shaking can cause severe damage from falling objects or broken utility lines. Fire and explosions are also hazards associated with strong ground shaking.

While Richter magnitude provides a useful measure of comparison between earthquakes, the moment magnitude is more widely used for scientific comparison, since it accounts for the actual slip that generated the earthquake. Actual damage is due to the propagation of seismic or ground waves as result of initial failure, and the intensity of shaking is related as much to earthquake magnitude as to the condition of underlying materials. Loose materials tend to amplify ground waves, while hard rock can quickly attenuate them, causing little damage to overlying structures. For this reason, the Modified Mercalli Intensity (MMI) Scale provides a useful qualitative assessment of ground shaking. The MMI Scale is a 12-point scale of earthquake intensity based on local effects experienced by people, structures, and earth materials. Each succeeding step on the scale describes a progressively greater amount of damage at a given point of observation. The MMI Scale is shown in Table 4.6-4 along with relative ground velocity and acceleration.

Table 4.6-4: Modified Mercalli Intensity (MMI) Scale

Richter Magnitude	Modified Mercalli Intensity	Effects	Average Peak-Ground Velocity (centimeters/ seconds)	Average Peak Acceleration
0.1 to 0.9	I	Not felt. Marginal and long-period effects of large earthquakes.	—	—
1.0 to 2.9	II	Felt by only a few persons at rest, especially on upper floors of building. Delicately suspended objects may swing.	—	—
3.0 to 3.9	III	Felt quite noticeable in doors, especially on upper floors of building, but many people do not recognize it as an earthquake. Standing cars may rock slightly. Vibration like passing a truck. Duration estimated.	—	0.0035 to 0.007 g
4.0 to 4.5	IV	During the day, felt indoors by many, outdoors by few. At night, some awakened. Dishes, windows, doors disturbed; walls make creaking sound. Sensations like heavy truck striking building. Standing cars rocked noticeably.	1 to 3	0.015 to 0.035 g
4.6 to 4.9	V	Felt by nearly everyone, many awakened. Some dishes, windows, broken; cracked plaster in a few places; unstable objects overturned. Disturbances of trees, poles, and other tall objects sometimes noticed. Pendulum clocks may stop.	3 to 7	0.035 to 0.07 g
5.0 to 5.5	VI	Felt by all, many frightened and run outdoors. Some heavy furniture moved; a few instances of falling plaster and damaged chimneys. Damage	7 to 20	0.07 to 0.15 g

Richter Magnitude	Modified Mercalli Intensity	Effects	Average Peak-Ground Velocity (centimeters/ seconds)	Average Peak Acceleration
		slight.		
5.6 to 6.4	VII	Everyone runs outdoors. Damage negligible in buildings of good design and construction; slight to moderate in well built, ordinary structures; considerable in poorly built or badly designed structures; some chimneys broken. Noticed by persons driving cars.	20 to 60	0.15 to 0.35 g
6.5 to 6.9	VIII	Damage slight in specially designed structures; considerable in ordinary substantial buildings with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monument walls, and heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. Persons driving in cars disturbed.	60 to 200	0.35 to 0.7 g
7.0 to 7.4	IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings, with partial collapse. Buildings shifted off foundations. Ground cracked conspicuously. Underground pipes broken.	200 to 500	0.7 to 1.2 g

Richter Magnitude	Modified Mercalli Intensity	Effects	Average Peak-Ground Velocity (centimeters/ seconds)	Average Peak Acceleration
7.5 to 7.9	X	Some well-built structures destroyed; most masonry and frame structures destroyed with foundations; ground badly cracked. Railway lines bent. Landslides considerable from riverbanks and steep slopes. Shifted sand and mud. Water splashed, slopped over banks.	≥ 500	>1.2 g
8.0 to 8.4	XI	Few, if any masonry structures remain standing. Bridges destroyed. Broad fissures in ground. Underground pipelines completely out of service. Earth slumps and land slips in soft ground. Rails bent greatly.		
≥ 8.5	XII	Total damage. Waves seen on ground. Lines of sight and level distorted. Objects thrown into the air.		
Source: Wood, H. O., and F. Neumann 1931.				

Ground Failure

Ground failure includes liquefaction and the liquefaction-induced phenomena of lateral spreading and lurching.

Liquefaction is a process by which sediments below the water table temporarily lose strength during an earthquake and behave as a viscous liquid rather than a solid. Liquefaction is restricted to certain geologic and hydrologic environments, primarily recently deposited sand and silt in areas with high groundwater levels. The process of liquefaction involves seismic waves passing through saturated granular layers, distorting the granular structure and causing the particles to collapse. This causes the granular layer to behave temporarily as a viscous liquid rather than a solid, resulting in liquefaction.

Liquefaction can cause the soil beneath a structure to lose strength which in turn causes a structure to settle or tip. Loss of bearing strength and floatation can also cause light structures to rise buoyantly through the liquefied soil.

Lateral spreading is lateral ground movement, with some vertical component, as the result of liquefaction. In effect, the soil rides on top of the liquefied layer. Lateral spreading can occur on relatively flat sites with slopes less than 2 percent, under certain circumstances, and can cause cracking and settlement.

Lurching is the movement of the ground surface toward an open face when the soil liquefies. An open face could be a graded slope, stream bank, canal face, gully, or other similar feature.

Landslides and Slope Failure

Landslides and other forms of slope failure form in response to the long-term geologic cycle of uplift, mass wasting, and disturbance of slopes. Mass wasting refers to a variety of erosional processes from gradual downhill soil creep to mudslides, debris flows, landslides, and rock fall, processes that are commonly triggered by intense precipitation, which varies according to climactic shifts. Often, various forms of mass wasting are grouped together as landslides, which are generally used to describe the downhill movement of rock and soil.

Geologists classify landslides into several different types that reflect differences in the type of material and type of movement. The four most common types of landslides are translational, rotational, earth flow, and rock fall. Debris flows are another common type of landslide similar to earth flows, except that the soil and rock particles are coarser. Mudslide is a term that appears in non-technical literature to describe a variety of shallow, rapidly-moving earthflows.

4.6.2 Regulatory Setting

Federal

With respect to soil erosion and sedimentation, the Clean Water Act (CWA) section 402 mandates that certain types of construction activity comply with the requirements of the U.S. Environmental Protection Agency's (EPA) National Pollution Prevention Discharge Elimination System (NPDES) stormwater program. Construction activities that disturb one or more acres of land must obtain coverage under the NPDES general construction activity stormwater permit, which is issued by the Central Valley Regional Water Quality Control Board (CVRWQCB). Obtaining coverage under the NPDES general construction activity stormwater permit generally requires that the project applicant complete the following steps:

- File a Notice of Intent with CVRWQCB that describes that proposed construction activity before construction begins;
- Prepare a Storm Water Pollution Prevention Plan (SWPPP) that describes Best Management Practices (BMPs) that will be implemented to control accelerated erosion, sedimentation, and other pollutants during and after project construction; and
- File a notice of termination with CVRWQCB when construction is complete and the construction area has been permanently stabilized.

State

Alquist-Priolo Earthquake Fault Zoning Act

In response to the severe fault rupture damage of structures by the 1971 San Fernando earthquake, the State of California enacted the Alquist-Priolo Earthquake Fault Zoning Act in 1972. This act required the State Geologist to delineate Earthquake Fault Zones (EFZs) along known active faults that have a relatively high potential for ground rupture. Faults that are zoned under the Alquist-Priolo Act must meet the strict definition of being “sufficiently active” and “well-defined” for inclusion as an EFZ. The EFZs are revised periodically and they extend 200 to 500 feet on either side of identified fault traces. No structures for human occupancy may be built across an identified active fault trace. An area of 50 feet on either side of an active trace is assumed to be underlain by the fault, unless proven otherwise. Proposed construction in an EFZ is permitted only followed the completion of a fault location map prepared by a California Professional Geologist.

California Building Standards Code

Title 24 of the California Code of Regulations, also known as the California Building Standards Code, sets forth minimum requirements for building design and construction. The California Building Standards Code is a compilation of three types of building standards from three different origins:

- Building standards that have been adopted by State agencies without change from the building standards contained in national model codes;

- Building standards that have been adopted and adapted from the national model code standards to meet California conditions; and

- Building standards, authorized by the California legislature, that constitute extensive additions not covered by the model codes that have been adopted to address particular California concerns.

In the context of earthquake hazards, the California Building Standards Code's design standards have a primary objective of assuring public safety and a secondary goal of minimizing property damage and maintaining function during and following seismic events. Recognizing that the risk of severe seismic ground motion varies from place to place, the California Building Standards Code seismic code provisions will vary depending on location (Seismic Zones 0, 1, 2, 3, and 4; with 0 being the least stringent and 4 being the most stringent).

Pipeline Industry Guidelines

In addition to all other applicable Federal and State codes and regulations, and industry standards for pipeline design, the CSLC requires that the pipeline design also meet the requirements of current seismological engineering standards such as the "Guidelines for the Design of Buried Steel Pipe" by American Lifeline Alliance and "The Guidelines for the Seismic Design and Assessment of Natural Gas and Liquid Hydrocarbon Pipelines" by the Pipeline Research Council International, Inc. The CSLC also requires that all engineered structures, including pipeline alignment drawings, profile drawings, buildings and other structures, and other appurtenances and associated facilities, to be designed, signed, and stamped by California registered professionals certified to perform such activities in their jurisdiction.

Regional Water Quality Control Board

With respect to soil erosion and sedimentation, the RWQCB regulates State water quality standards in the vicinity of the Project area. Beneficial uses and water quality objectives for surface water and groundwater resources in the Project area are established in the water quality control plans (basin plans) of each RWQCB as mandated by the State Porter-Cologne Act and the CWA. The RWQCBs also implement the CWA section 303(d) total maximum daily load (TMDL) process, which consists of identifying candidate water bodies where water quality is impaired by the presence of pollutants. The TMDL process is implemented to determine the assimilative capacity of the water body for pollutants of concern and to establish equitable allocation of allowable pollutant loading within the watershed. Section 401 of the CWA requires an applicant pursuing a federal permit to conduct any activity that may result in a discharge of a pollutant to obtain a water quality certification or waiver from the RWQCB.

The RWQCBs primarily implement basin plan policies through issuing waste discharge requirements for waste discharges to land and water. The RWQCBs are also responsible for administering the NPDES permit program, which is designed to manage and monitor point and nonpoint source pollution. NPDES stormwater permits for general construction activity are required for projects that disturb more than one acre of land. Municipal NPDES stormwater permits are required for urban areas with populations greater than 100,000.

The general NPDES stormwater permits for general construction activities require the applicant to file a Notice of Intent (NOI) to discharge stormwater with the RWQCB and to prepare and implement an SWPPP. The SWPPP would include a site map, description of stormwater discharge activities, and a list of BMPs that would be employed to prevent water pollution. It must describe BMPS that would be used to control soil erosion and discharges and other construction-related pollutants (e.g., petroleum products, solvents, cement) that could contaminate nearby water resources. It must demonstrate compliance with local and regional erosion and sediment control standards, identify responsible parties, provide a detailed construction timeline, and implement a BMP monitoring and maintenance schedule.

Local

There are no local regulations pertaining to geology and soils in the Project area.

4.6.3 Significance Criteria

An adverse impact on geology and soils is considered significant and would require mitigation if:

1. Settlement of the soil could substantially damage structural components;
2. Agricultural productivity would be reduced for longer than 3 years because of soil mixing, structural damage, or compaction;
3. Ground motion due to a seismic event or any resulting phenomenon such as liquefaction or settlement could substantially damage structural components;

4. Rupture of a known earthquake fault as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map could expose people or structures to potential adverse effects;

5. Damage resulting from any of the above conditions could result in an inadvertent or uncontrolled release of hazardous, harmful or damaging substances into the environment;

6. Result in substantial soil erosion or the loss of topsoil;

7. Erosion rates would be increased, or soil productivity would be reduced by compaction or soil mixing, to a level that would prevent successful rehabilitation and eventual reestablishment of vegetative cover to the recommended or pre-construction composition and density; or

8. Any Project activity or condition that would adversely affect the stability or proper functioning of any levee or levee system.

4.6.4 Applicant Proposed Measures

No Applicant Proposed Measures (APMs) have been identified by PG&E related to geology and soils.

4.6.5 Impact Analysis and Mitigation

Impact Discussion

Soil Settlement

The Project would not cause settlement of the soil that could substantially damage structural components. Compressible soils are present in areas along the pipeline route. Buried pipelines typically do not cause underlying soils to settle as they represent less load than the weight of the soil mass removed to install the pipe. Poorly-compacted backfill over the newly installed pipe may constitute a compressible soil that may settle in time and/or with the introduction of water. Loads imposed by surface improvements may cause compressible soils to settle.

Techniques that would be used to remedy compressible soils include removal and recompaction (to improve their density), surcharging, compaction grouting, deep soil compaction, deep foundations, or foundations specially designed to tolerate the anticipated settlement. The six aboveground facilities (discussed in Section 2.0, Project Description) are the only structures that would be constructed above the pipeline. The use of the above techniques would result in no or minimal adverse impacts to structural components from the settlement of soils. Any potential adverse impacts would be less than significant (Class III).

Agricultural Productivity

Open trenching techniques would generally be used in agricultural areas. During excavation topsoil would be removed, stockpiled, and replaced in accordance with landowner negotiations. Topsoil stockpiles would be placed on one side of the trench, while overburden and construction activities would occur on the other side of the trench. Some excess overburden would be stockpiled and removed. This approach would minimize any potential soil mixing. Replacement of the topsoil in agricultural areas would be done in accordance with landowner negotiations; therefore, structural damage and compaction would not impact agricultural productivity. Therefore, any potential adverse impacts to agricultural productivity because of soil mixing, structural damage, or compaction would be less than significant (Class III).

Release of Substances into the Environment

The Project would not result in an inadvertent or uncontrolled release of hazardous, harmful or damaging substances into the environment. The SWPPP would include list of BMPs that would be employed to prevent water pollution. A frac-out is possible during HDD, which could degrade water quality as a result of drilling muds being discharged into a stream or river. As proposed in APM HWQ-5 and APM BIO-23, PG&E would develop an HDD Fluid Release Contingency Plan that would require mitigation in the unlikely event of a frac-out resulting in discharge of drilling mud that would potentially result in adverse impacts to water quality. The plan would include measures to contain and clean up any drilling mud inadvertently released. Impacts would be less than significant (Class III).

Soil Erosion and Topsoil

The Project would not result in substantial soil erosion or the loss of topsoil. As proposed in APM HWQ-1, MM HWQ-1, MM SW-1, and APM BIO-7, PG&E would implement measures contained within the Water Quality Construction Best Management Practices Manual, in addition to those in an Erosion Control and Sediment Transport Plan and the SWPPP for the Project, and any subsequent permit obligations pertaining to pollution. Collectively, these measures would ensure that all erosion control plans are implemented and BMPs are employed to prevent erosion and improper conveyance of stormwater during construction and operation. Impacts would be less than significant (Class III).

Vegetative Cover

The Project would not increase erosion rates, or reduce soil productivity by compaction or soil mixing, to a level that would prevent successful rehabilitation and eventual reestablishment of vegetative cover to the recommended or pre-construction composition and density. The discussion under Soil Erosion and Topsoil above addresses erosion rates, while the discussion under Agricultural Productivity addresses soil mixing. PG&E's Water Quality Construction Best Management Practices Manual (PG&E 2006) includes BMPs that would minimize impacts on erosion and vegetative cover such as:

- Preserve existing vegetation whenever possible;
- Whenever possible, minimize disturbed areas by locating temporary roadways to avoid stands of trees and shrubs, and follow existing contours to reduce cutting and filling;
- Consider the impact of grade changes to existing vegetation and the root zone;
- Use one or more of the below temporary soil stabilization practices, when applicable - hydraulic mulch, hydro seeding, soil binders, straw mulch, geotextiles, and/or plastic covers and erosion control blankets/mats;
- Implement before the onset of precipitation; and
- Implement BMPs such as fiber rolls or gravel bag berms to break up the slope lengths.

Revegetation of disturbed areas would be accomplished under APM BIO-16, APM BIO-17, and APM BIO-19 as well as MM BIO-1a, MM BIO-1b, MM BIO-1c, and MM BIO-2a. The BMPs and APMs referenced above would result in successful rehabilitation and reestablishment of vegetative cover to the recommended or pre-construction composition and density and therefore there would be less than significant impacts (Class III).

Levee or Levee System

Project activities or conditions would not adversely affect the stability or proper functioning of any levee or levee system. The Project includes planned HDD crossings beneath several flood control levees. The possible degradation of the integrity and stability of the levees due to the crossings is a concern. The geotechnical design report for the Project (Kleinfelder 2007) has provisions to protect the levees, including settlement monitoring during construction and grouting (sealing) the pipeline/boring configuration to prevent water seepage along it. The HDD crossings would occur beneath the levees and adjoining channels and would have entry and exit points several hundred feet beyond the landsides of the levees.

Implementation of the recommendations of the geotechnical report and the requirements of the jurisdictional agencies would result in less than significant impacts to the stability or performance of the flood control levees (Class III).

Impact GEO-1: Known Earthquake Faults / Ground Motion

The Project would result in a risk of damage to structures from ground motion due to a seismic event or resulting phenomenon such as liquefaction or settlement, or from rupture of a known earthquake fault as delineated on the most recent Alquist Priolo Earthquake fault Zoning Map (Potentially Significant, Class II).

Seismicity (which includes active faults, ground shaking, and soil liquefaction) is the primary geologic hazard that could affect the proposed Project facilities. A portion of the proposed Project pipeline facilities would be located in a seismically active region. Three faults are identified crossing the proposed pipeline alignment, the Great Valley, Dunnigan Hills, and Willows faults. All three faults are believed to exist at depth and do not reach the surface. The Great Valley and Dunnigan Hills faults are considered active.

There is a potential for liquefaction to occur along portions of the pipeline alignment as a result of ground shaking during earthquakes. Liquefaction can cause settlement of soils and the structures on which they are built. Because liquefied soils behave as a liquid for a short time, there may also be a tendency for buoyant facilities to float. Liquefiable soils and its effects can be remedied by removal and recompaction, of deep foundations extending into underlying competent materials, deep dynamic compaction, vibro-compaction, other soil modifications, and/or structural designs incorporated to withstand the potential effects of liquefied soil conditions.

Due to the proposed pipeline crossing of the three faults, the Project area is subject to ground shaking due to earthquakes. Historically, the area has experienced a low to moderate seismicity. The Project could be exposed to ground motion due to a seismic event or any resulting phenomenon such as liquefaction or settlement that could substantially damage structural components.

MM GEO-1 Site Specific Seismic Field Investigation

PG&E shall perform a site-specific seismic field investigation as part of its detailed design phase for the proposed Project. The field investigation would determine whether any engineering/design solutions are needed to mitigate against any hazards of seismic displacements along the fault crossings. If the field investigation determines the presence of any active faults in project location, then the following shall be completed:

PG&E shall determine the engineering/design solutions that are appropriate to mitigate against the hazard of seismic displacements along any active faults.

PG&E shall develop a computer model to determine the soil-pipe interaction with the proposed applied displacement. The model would evaluate various combinations of pipe wall thickness and pipe grade to determine which pattern yields the best performance under displacement conditions. The design shall also incorporate additional methods as necessary.

PG&E shall design the proposed pipelines and any other proposed facilities using industry standards for seismic-resistant design in liquefaction-prone areas.

PG&E shall provide a copy of the final design, as well as any related geotechnical information, to the CSLC before construction of the proposed Project.

A certified engineer shall observe the construction excavation in the vicinity of the fault crossings to verify that the design assumptions are valid and the design measures (if any) are centered in the correct location.

Rationale for Mitigation

The seismic field investigation would determine whether engineering/design solutions are needed to mitigate against any hazards of seismic displacements along the fault crossings. Any necessary design features would ensure strength and ductility of the pipeline facilities in order to reduce the potential impacts associated with displacement caused by surface faulting and liquefaction.

4.6.6 Impacts of Alternatives

A No Project Alternative as well as twelve options have been proposed for the alignment in order to minimize or eliminate environmental impacts of the proposed Project and to respond to comments from nearby landowners. The twelve options, labeled A through L, have been analyzed in comparison to the portion of the proposed route that has been avoided as a result of the option. Descriptions of the options can be found in Section 3.0, Alternatives and Cumulative Projects, and are depicted in Figure 3-2A through Figure 3-2K.

No Project Alternative

Under the No Project Alternative, no impacts to geology or soils would result. The No Project Alternative would eliminate any potential direct or indirect impacts to settlement, agricultural productivity, damage from ground motion or earthquakes, release of damaging substances, soil erosion, vegetative cover or levees that could result from the installation of pipelines, the construction of aboveground stations, and other construction-related activities.

Option A

The geologic and topographic conditions associated with Option A are similar to those described above for the proposed Project. Option A would cross one soil type not crossed by the proposed Project: Zamora loam. Table 4.6-5 contains the relevant properties of additional soils encountered under Option A.

Table 4.6-5: Properties of Zamora Loam

Name	Map Symbol	Percent Slope	Shrink-Swell Potential[1]	Erosion Potential[2]	Depth to Bedrock[3] (ft bgs)[4]	Nature of Bedrock[3]	Depth to Water[5] (ft bgs)	Corrosion Potential (Steel)
Zamora Loam	Za	0 to 1	Not available	Not available	More than 6.6	Not available	More than 6.6	Not available

Notes:
[1] Based on Linear Expansivity Potential. [2] Estimated from slope. Soil with minimum slope not rated. [3] Depth to bedrock provided. [4] ft bgs = feet below ground surface.
[5] Depth to groundwater provided when noted in soil survey. Depth to water not provided if typically greater than 6 ft bgs.
Source: PG&E 2007.

With respect to the disruption of agricultural soils, Option A would reduce the segmentation of agricultural fields in Yolo County by avoiding the placement of pipeline through 8 of the 16 agricultural fields that the proposed project would cross for Line 406. Instead, the majority of the construction activities under Option A would parallel agricultural parcel boundaries; regardless, both Option A and the proposed project alignment would traverse agricultural soils. Option A would increase the pipeline length by 2,200 feet, which would have slightly greater impacts on soils in general. However, similar to the proposed Project, impacts to agricultural soils resulting from Option A would be less than significant (Class III).

Like the proposed Project, Option A would require implementation of APM HWQ-1, MM HWQ-1, MM SW-1, and APM BIO-7 in order to reduce impacts to soil erosion or loss of topsoil to a less than significant level of impact. Option A would also require implementation of APM BIO-16, APM BIO-17, and APM BIO-19, as well as MM BIO-1a, MM BIO-1b, MM BIO-1c, and MM BIO-2a, in order to reduce impacts to soils and vegetative cover to a less than significant level. The recommendations of the geotechnical report for the proposed project would be implemented under Option A to minimize impacts to levees.

In addition, Option A would implement the SWPPP BMPs that prevent water pollution. APM HWQ-5 and APM BIO-23 would be implemented under Option A to reduce potential impact of a frac-out. Similar to the proposed Project, impacts to agricultural productivity, soil erosion and topsoil, vegetative cover, release of substances into the environment, and levee or levee system would be less than significant (Class III) under Option A.

Geologic impacts of Option A would be slightly more than under the proposed project. Similar to the proposed Project, Option A would cross the Great Valley fault. The proposed Project would cross an inferred alignment of the Dunnigan Hills fault, which is assumed to be buried in the vicinity of the proposed Project. However, Option A would cross the southern end of the Dunnigan Hills Fault in the vicinity of apparent surface rupture. As discussed in Impact GEO-1, the Dunnigan Hills fault and the Great Valley fault are considered active. Due to the proximity to the Dunnigan Hills fault, Option A would be subject to a greater risk of seismic hazards than the proposed Project. Similar to the proposed Project, impacts for known earthquake faults / ground motion associated with Option A would be potentially significant (Class II). Implementation of MM GEO-1 would be required to reduce impacts to less than significant.

Option A would result in slightly greater potential impacts to agricultural soils and slightly greater geologic impacts than the proposed Project.

Option B

The geologic and topographic conditions associated with Option B are similar to those described above for the proposed Project. Option B would cross one soil type not crossed by the proposed Project: Zamora loam. Table 4.6-5 contains the relevant properties of additional soils encountered under Option B.

With respect to the disruption of agricultural soils, Option B would reduce segmentation of agricultural fields in Yolo County by avoiding the segmentation of 13 of the 16 agricultural fields that the proposed project would cross for Line 406. Instead, the majority of the construction activities under Option B would parallel agricultural parcel boundaries. Regardless, both Option B and the proposed project alignment would traverse agricultural soils. Option B would increase the pipeline length by 2,600 feet, which would have slightly greater impacts on soils in general. However, similar to the proposed Project, impacts to agricultural soils resulting from Option B would be less than significant (Class III).

Like the proposed Project, Option B would require implementation of APM HWQ-1, MM HWQ-1, MM SW-1, and APM BIO-7 in order to reduce impacts to soil erosion or loss of topsoil to a less than significant level of impact. Option B would also require implementation of APM BIO-16, APM BIO-17, and APM BIO-19, as well as MM BIO-1a, MM BIO-1b, MM BIO-1c, and MM BIO-2a, in order to reduce impacts to soils and vegetative cover to a less than significant level. The recommendations of the geotechnical report for the proposed Project would be implemented under Option B to minimize impacts to levees. In addition, Option B would implement the SWPPP BMPs that prevent water pollution. APM HWQ-5 and APM BIO-23 would be implemented under Option B to reduce potential impact of a frac-out. Similar to the proposed Project, impacts to agricultural productivity, soil erosion and topsoil, vegetative cover, release of substances into the environment, and levee or levee system would be less than significant (Class III) under Option B.

Geologic impacts of Option B would be similar to the proposed project. Similar to the proposed Project, Option B would cross the Great Valley fault and be located approximately 5 miles from the Dunnigan Hills Fault. As discussed in Impact GEO-1, the Great Valley Fault and the Dunnigan Hills Fault are considered active. Similar to the proposed Project, impacts for known earthquake faults / ground motion associated with Option B would be potentially significant (Class II). Implementation of MM GEO-1 would be required to reduce impacts to less than significant.

Option B would result in slightly greater potential impacts to agricultural soils and similar geologic impacts to the proposed Project.

Option C

The geologic and topographic conditions associated with Option C are similar to those described above for the proposed Project. Option C would not cross additional soil types.

With respect to the disruption of agricultural soils, Option C would avoid the segmentation of 3 of the 16 agricultural fields that the proposed project would cross for Line 406. Instead, construction activities under Option C would parallel agricultural parcel boundaries. Regardless, both Option C and the proposed project alignment would traverse agricultural soils. Option C would increase the pipeline length by 1,150 feet, which would have slightly greater impacts on soils in general. However, similar to the proposed Project, impacts to agricultural soils resulting from Option C would be less than significant (Class III).

Like the proposed Project, Option C would require implementation of APM HWQ-1, MM HWQ-1, MM SW-1, and APM BIO-7 in order to reduce impacts to soil erosion or loss of topsoil to a less than significant level of impact. Option C would also require implementation of APM BIO-16, APM BIO-17, and APM BIO-19, as well as MM BIO-1a, MM BIO-1b, MM BIO-1c, and MM BIO-2a, in order to reduce impacts to soils and vegetative cover to a less than significant level. The recommendations of the geotechnical report for the proposed Project would be implemented under Option C to minimize impacts to levees. In addition, Option C would implement the SWPPP BMPs that prevent water pollution. Similar to the proposed Project, impacts to agricultural productivity, soil erosion and topsoil, vegetative cover, release of substances into the environment, and levee or levee system would be less than significant (Class III) under Option C.

Geologic impacts of Option C would be similar to the proposed project. Similar to the proposed Project, Option C would cross the Great Valley fault and be located almost 9.5 miles from the Dunnigan Hills Fault. As discussed in Impact GEO-1, the Great Valley Fault and the Dunnigan Hills Fault are considered active. Similar to the proposed Project, impacts for known earthquake faults / ground motion associated with Option C would be potentially significant (Class II). Implementation of MM GEO-1 would be required to reduce impacts to less than significant.

Option C would result in slightly greater potential impacts to agricultural soils and similar geologic impacts to the proposed Project.

Option D

The geologic and topographic conditions associated with Option D are similar to those described above for the proposed Project. Option D would not cross additional soil types.

With respect to the disruption of agricultural soils, Option D would reduce the segmentation of agricultural fields in Yolo County by avoiding placement of the pipeline through 10 of the 16 agricultural fields that the proposed project would cross for Line 406. Instead, construction activities under Option D would parallel agricultural parcel boundaries, mostly adjacent to CR-17. Regardless, both Option D and the proposed project alignment would traverse agricultural soils. Option D would increase the pipeline length by 860 feet, which would have slightly greater impacts on soils in general. However, similar to the proposed Project, impacts to agricultural soils resulting from Option D would be less than significant (Class III).

Like the proposed Project, Option D would require implementation of APM HWQ-1, MM HWQ-1, MM SW-1, and APM BIO-7 in order to reduce impacts to soil erosion or loss of topsoil to a less than significant level of impact. Option D would also require implementation of APM BIO-16, APM BIO-17, and APM BIO-19, as well as MM BIO-1a, MM BIO-1b, MM BIO-1c, and MM BIO-2a, in order to reduce impacts to soils and vegetative cover to a less than significant level. The recommendations of the geotechnical report for the proposed Project would be implemented under Option D to minimize impacts to levees. In addition, Option D would implement the SWPPP BMPs that prevent water pollution. Similar to the proposed Project, impacts to agricultural productivity, soil erosion and topsoil, vegetative cover, release of substances into the environment, and levee or levee system would be less than significant (Class III) under Option D.

Geologic impacts of Option D would be similar to the proposed project. Similar to the proposed Project, Option D would be located less than 2 miles from the Great Valley fault and approximately 6.5 miles from the Dunnigan Hills Fault. As discussed in Impact GEO-1, the Great Valley Fault and the Dunnigan Hills Fault are considered active. Similar to the proposed Project, impacts for known earthquake faults / ground motion associated with Option D would be potentially significant (Class II). Implementation of MM GEO-1 would be required to reduce impacts to less than significant.

Option D would result in slightly greater potential impacts to agricultural soils and similar geologic impacts to the proposed Project.

Option E

The geologic and topographic conditions associated with Option E are similar to those described above for the proposed Project. Option E would not cross additional soil types.

With respect to the disruption of agricultural soils, Option E would reduce segmentation of agricultural fields in Yolo County by avoiding the placement of pipeline through 10 of the 16 agricultural fields that the proposed project would cross for Line 406. Instead, construction activities under Option E would parallel agricultural parcel boundaries, mostly adjacent to CR-19. Regardless, both Option E and the proposed project alignment would traverse agricultural soils. Option E would increase the pipeline length by 3,480 feet, which would have slightly greater impacts on soils in general. However, similar to the proposed Project, impacts to agricultural soils resulting from Option E would be less than significant (Class III).

Like the proposed Project, Option E would require implementation of APM HWQ-1, MM HWQ-1, MM SW-1, and APM BIO-7 in order to reduce impacts to soil erosion or loss of topsoil to a less than significant level of impact. Option E would also require implementation of APM BIO-16, APM BIO-17, and APM BIO-19, as well as MM BIO-1a, MM BIO-1b, MM BIO-1c, and MM BIO-2a, in order to reduce impacts to soils and vegetative cover to a less than significant level. The recommendations of the geotechnical report for the proposed Project would be implemented under Option E to minimize impacts to levees. In addition, Option E would implement the SWPPP BMPs that prevent water pollution. Similar to the proposed Project, impacts to agricultural productivity, soil erosion and topsoil, vegetative cover, release of substances into the environment, and levee or levee system would be less than significant (Class III) under Option E.

Geologic impacts of Option E would be similar to the proposed project. Similar to the proposed Project, Option E would be located less than 2 miles from the Great Valley fault and approximately 6.5 miles from the Dunnigan Hills Fault. As discussed in Impact GEO-1, the Great Valley Fault and the Dunnigan Hills Fault are considered active. Similar to the proposed Project, impacts for known earthquake faults / ground motion associated with Option E would be potentially significant (Class II). Implementation of MM GEO-1 would be required to reduce impacts to less than significant.

Option E would result in slightly greater potential impacts to agricultural soils and similar geologic impacts to the proposed Project.

Option F

The geologic and topographic conditions associated with Option F are similar to those described above for the proposed Project. Option F would not cross additional soil types.

With respect to the disruption of agricultural soils, Option F would increase segmentation of agricultural fields in Yolo County. Whereas the proposed Project would segment grazing land, Option F would instead segment an agricultural field with row crops. Regardless, both Option F and the proposed project alignment would traverse agricultural soils. Option F would not increase the pipeline length. Similar to the proposed Project, impacts to agricultural soils resulting from Option F would be less than significant (Class III).

Like the proposed Project, Option F would require implementation of APM HWQ-1, MM HWQ-1, MM SW-1, and APM BIO-7 in order to reduce impacts to soil erosion or loss of topsoil to a less than significant level of impact. Option F would also require implementation of APM BIO-16, APM BIO-17, and APM BIO-19, as well as MM BIO-1a, MM BIO-1b, MM BIO-1c, and MM BIO-2a, in order to reduce impacts to soils and vegetative cover to a less than significant level. The recommendations of the geotechnical report for the proposed Project would be implemented under Option F to minimize impacts to levees. In addition, Option F would implement the SWPPP BMPs that prevent water pollution. Similar to the proposed Project, impacts to agricultural productivity, soil erosion and topsoil, vegetative cover, release of substances into the environment, and levee or levee system would be less than significant (Class III) under Option F.

Geologic impacts of Option F would be similar to the proposed project. Similar to the proposed Project, Option F would be located approximately 9 miles from the Great Valley fault and approximately 1 mile from the Dunnigan Hills Fault. As discussed in Impact GEO-1, the Great Valley Fault and the Dunnigan Hills Fault are considered active. Similar to the proposed Project, impacts for known earthquake faults / ground motion associated with Option F would be potentially significant (Class II). Implementation of MM GEO-1 would be required to reduce impacts to less than significant.

Option F would have similar potential impacts on agricultural soils and similar geologic impacts to the proposed Project.

Option G

The geologic and topographic conditions associated with Option G are similar to those described above for the proposed Project. Option G would not cross additional soil types.

With respect to the disruption of agricultural soils, Option G would reduce segmentation of agricultural fields in Yolo County by not segmenting one of the agricultural fields that the proposed project would cross for Line 406. Instead, construction activities under Option G would parallel the agricultural parcel boundaries. Regardless, both Option G and the proposed project alignment would traverse agricultural soils. Option G would not increase the pipeline length. Similar to the proposed Project, impacts to agricultural soils resulting from Option G would be less than significant (Class III).

Like the proposed Project, Option G would require implementation of APM HWQ-1, MM HWQ-1, MM SW-1, and APM BIO-7 in order to reduce impacts to soil erosion or loss of topsoil to a less than significant level of impact. Option G would also require implementation of APM BIO-16, APM BIO-17, and APM BIO-19, as well as MM BIO-1a, MM BIO-1b, MM BIO-1c, and MM BIO-2a, in order to reduce impacts to soils and vegetative cover to a less than significant level. In addition, Option G would implement the SWPPP BMPs that prevent water pollution. Similar to the proposed Project, impacts to agricultural productivity, soil erosion and topsoil, vegetative cover, release of substances into the environment, and levee or levee system would be less than significant (Class III) under Option G.

Geologic impacts of Option G would be similar to the proposed project. Similar to the proposed Project, Option G would be located almost 12 miles from the Great Valley fault and almost 3 miles from the Dunnigan Hills Fault. As discussed in Impact GEO-1, the Great Valley Fault and the Dunnigan Hills Fault are considered active. Similar to the proposed Project, impacts for known earthquake faults / ground motion associated with Option G would be potentially significant (Class II).

Implementation of MM GEO-1 would be required to reduce impacts to less than significant.

Therefore, Option G would have similar potential impacts on agricultural soils and similar geologic impacts to the proposed Project.

Option H

The geologic and topographic conditions associated with Option H are similar to those described above for the proposed Project. Option H would cross eleven soil type not crossed by the proposed Project. Table 4.6-6 contains the relevant properties of additional soils encountered under Option H.

With respect to the disruption of agricultural soils, Option H would increase the segmentation of agricultural fields in Yolo County for Line 407 West. The proposed Project would bisect four agricultural fields, whereas Option H would bisect eight. Regardless, both Option H and the proposed project alignment would traverse agricultural soils. Option H would decrease the pipeline length by 2,900 feet, which would have slightly fewer impacts on soils in general. Similar to the proposed Project, impacts to agricultural soils resulting from Option H would be less than significant (Class III).

Like the proposed Project, Option H would require implementation of APM HWQ-1, MM HWQ-1, MM SW-1, and APM BIO-7 in order to reduce impacts to soil erosion or loss of topsoil to a less than significant level of impact. Option H would also require implementation of APM BIO-16, APM BIO-17, and APM BIO-19, as well as MM BIO-1a, MM BIO-1b, MM BIO-1c, and MM BIO-2a, in order to reduce impacts to soils and vegetative cover to a less than significant level. The recommendations of the geotechnical report for the proposed project would be implemented under Option H to minimize impacts to levees. In addition, Option H would implement the SWPPP BMPs that prevent water pollution. APM HWQ-5 and APM BIO-23 would be implemented under Option H to reduce potential impact of a frac-out. Similar to the proposed Project, impacts to agricultural productivity, soil erosion and topsoil, vegetative cover, release of substances into the environment, and levee or levee system would be less than significant (Class III) under Option H.

Table 4.6-6: Option H New Soil Types

Name	Map Symbol	Percent Slope	Shrink-Swell Potential[1]	Erosion Potential[2]	Depth to restrictive feature[3] (ft bgs)[4]	Nature of restrictive feature[3]	Depth to Water[5] (ft bgs)	Corrosion Potential (Steel)
Clear Lake Clay, Hardpan substratum, drained,	115	0 to 1	High	Slight	3.3-6.6	Duripan	5-6	Not Available
Cosumnes Silt Loam, Partially drained	127	0 to 2	High	Slight	More than 6.7	Not Available	3	Not Available
Galt Clay, Leveled	151	0 to 1	High	Slight	3.3	Hardpan	More than 6.7	Not Available
Sacramento Clay	Sc	0 to 1	Not Available	Not Available	More than 6.7	Not Available	3-5	Not Available
Sacramento Silty clay loam	Sa	0 to 1	Not Available	Not Available	More than 6.7	Not Available	3-5	Not Available
Sailboat silt loam, partially drained	206	0 to 2	Not Available	Slight	Not Available	Not Available	3-5	Not Available
San Joaquin-Galt Complex Leveled	217	0 to 1	High	Slight	1.7-3.3	Hardpan	Not Available	Not Available
San Joaquin -Zerarents Complex, leveled	221	0 to 1	Low to High	Slight	2- more than 5	Hardpan	Not Available	Not Available
San Joaquin silt loam, leveled	213	0 to 1	High	Slight	1.9-3.3	Hardpan	Not Available	Not Available
Tyndall very fine sandy loam, deep	Te	0 to 1	Not Available	Not Available	More than 6.7	Not Available	3-7	Not Available
San Joaquin-Durixeralfs complex	216	0 to 1	High	Slight	2-3.3	Hardpan	Not Available	Not Available

Notes:
[1] Based on Linear Expansivity Potential. [2] Estimated from slope. Soil with minimum slope not rated. [3] Depth to bedrock provided. [4] ft bgs = feet below ground surface.
[5] Depth to groundwater provided when noted in soil survey. Depth to water not provided if typically greater than 6 ft bgs.
Source: PG&E 2007.

Geologic impacts of Option H would be the same as the proposed project. Similar to the proposed Project, Option H would be located almost 22 miles from the Great Valley fault and approximately 11 miles from the Dunnigan Hills Fault. As discussed in Impact GEO-1, the Great Valley Fault and the Dunnigan Hills Fault are considered active. Similar to the proposed Project, impacts for known earthquake faults / ground motion associated with Option H would be potentially significant (Class II). Implementation of MM GEO-1 would be required to reduce impacts to less than significant.

Therefore, Option H would have slightly fewer potential impacts on agricultural soils and similar geologic impacts to the proposed Project.

Option I

The geologic and topographic conditions associated with Option I are similar to those described above for the proposed Project. Option I would not cross additional soil types.

With respect to the disruption of agricultural soils, Option I would increase segmentation of agricultural fields in Placer County by bisecting three agricultural fields and along the boundary of a fourth agricultural field. The proposed Project would not bisect agricultural fields. Regardless, both Option I and the proposed project alignment would traverse agricultural soils. Option I would increase the pipeline length by 2,900 feet, which would have slightly greater impacts on soils in general. However, similar to the proposed Project, impacts to agricultural soils resulting from Option I would be less than significant (Class III).

Like the proposed Project, Option I would require implementation of APM HWQ-1, MM HWQ-1, MM SW-1, and APM BIO-7 in order to reduce impacts to soil erosion or loss of topsoil to a less than significant level of impact. Option I would also require implementation of APM BIO-16, APM BIO-17, and APM BIO-19, as well as MM BIO-1a, MM BIO-1b, MM BIO-1c, and MM BIO-2a, in order to reduce impacts to soils and vegetative cover to a less than significant level. The recommendations of the geotechnical report for the proposed Project would be implemented under Option I to minimize impacts to levees. In addition, Option I would implement the SWPPP BMPs that prevent water pollution. Similar to the proposed Project, impacts to agricultural productivity, soil erosion and topsoil, vegetative cover, release of substances into the environment, and levee or levee system would be less than significant (Class III) under Option I.

Geologic impacts of Option I would be similar to the proposed project. Similar to the proposed Project, Option I would be located approximately 32 miles from the Great Valley fault and almost 22 miles from the Dunnigan Hills Fault. As discussed in Impact GEO-1, the Great Valley Fault and the Dunnigan Hills Fault are considered active. Similar to the proposed Project, impacts for known earthquake faults / ground motion associated with Option I would be potentially significant (Class II). Implementation of MM GEO-1 would be required to reduce impacts to less than significant.

Option I would have slightly greater potential impacts on agricultural soils and similar geologic impacts to the proposed Project.

Option J

The geologic and topographic conditions associated with Option J are similar to those described above for the proposed Project. Option J would not cross additional soil types.

With respect to the disruption of agricultural soils, Option J would be similar to the proposed Project. Option J would not bisect agricultural fields, but instead would parallel agricultural parcel boundaries. Regardless, both Option J and the proposed project alignment would traverse agricultural soils. Option J would increase the pipeline length by 5,300 feet, which would have slightly greater impacts on soils in general. Similar to the proposed Project, impacts to agricultural soils resulting from Option J would be less than significant (Class III).

Like the proposed Project, Option J would require implementation of APM HWQ-1, MM HWQ-1, MM SW-1, and APM BIO-7 in order to reduce impacts to soil erosion or loss of topsoil to a less than significant level of impact. Option J would also require implementation of APM BIO-16, APM BIO-17, and APM BIO-19, as well as MM BIO-1a, MM BIO-1b, MM BIO-1c, and MM BIO-2a, in order to reduce impacts to soils and vegetative cover to a less than significant level. The recommendations of the geotechnical report for the proposed Project would be implemented under Option J to minimize impacts to levees. In addition, Option J would implement the SWPPP BMPs that prevent water pollution. Similar to the proposed Project, impacts to agricultural productivity, soil erosion and topsoil, vegetative cover, release of substances into the environment, and levee or levee system would be less than significant (Class III) under Option J.

Geologic impacts of Option J would be similar to the proposed project. Similar to the proposed Project, Option J would be located approximately 32 miles from the Great Valley fault and almost 22 miles from the Dunnigan Hills Fault. As discussed in Impact GEO-1, the Great Valley Fault and the Dunnigan Hills Fault are considered active. Similar to the proposed Project, impacts for known earthquake faults / ground motion associated with Option J would be potentially significant (Class II). Implementation of MM GEO-1 would be required to reduce impacts to less than significant.

Therefore, Option J would have slightly greater potential impacts on agricultural soils and similar geologic impacts to the proposed Project.

Option K

Option K. a portion of Line 406 East would be rerouted to the north to place the pipeline outside of a 1,500-foot safety buffer around a planned elementary school to be located south of Baseline Road. Rather than follow Baseline Road, Option K would bisect annual grassland.

The geologic and topographic conditions associated with Option K are similar to those described above for the proposed Project. Option K would not cross additional soil types.

With respect to the disruption of agricultural soils, Option K would be similar to the proposed Project. Option K would not bisect agricultural fields, but would instead bisect annual grassland. Regardless, both Option K and the proposed project alignment would traverse agricultural soils. Option K would increase the pipeline length by 70 feet, which would have slightly greater impacts on soils in general. Similar to the proposed Project, impacts to agricultural soils resulting from Option K would be less than significant (Class III).

Like the proposed Project, Option K would require implementation of APM HWQ-1, MM HWQ-1, MM SW-1, and APM BIO-7 in order to reduce impacts to soil erosion or loss of topsoil to a less than significant level of impact. Option K would also require implementation of APM BIO-16, APM BIO-17, and APM BIO-19, as well as MM BIO-1a, MM BIO-1b, MM BIO-1c, and MM BIO-2a, in order to reduce impacts to soils and vegetative cover to a less than significant level. In addition, Option K would implement the SWPPP BMPs that prevent water pollution. Similar to the proposed Project, impacts to agricultural productivity, soil erosion and topsoil, vegetative cover, release of substances into the environment, and levee or levee system would be less than significant (Class III) under Option K.

Geologic impacts of Option K would be similar to the proposed project. Similar to the proposed Project, Option K would be located approximately 32 miles from the Great Valley fault and almost 23 miles from the Dunnigan Hills Fault. As discussed in Impact GEO-1, the Great Valley Fault and the Dunnigan Hills Fault are considered active. Similar to the proposed Project, impacts for known earthquake faults / ground motion associated with Option K would be potentially significant (Class II). Implementation of MM GEO-1 would be required to reduce impacts to less than significant.

Option K would have slightly greater potential impacts on agricultural soils and similar geologic impacts to the proposed Project.

Option L

Under Option L, a portion of the proposed Project adjacent to Base Line Road would be constructed utilizing HDD instead of trenching. Option L would not change the location of the route, but would change the construction method from trenching to HDD.

The geologic and topographic conditions associated with Option L are similar to those described above for the proposed Project. Option L would not cross additional soil types.

With respect to the disruption of agricultural soils, Option L would be similar to the proposed Project, and impacts to agricultural soils resulting from Option L would be less than significant (Class III).

Like the proposed Project, Option L would require implementation of APM HWQ-1, MM HWQ-1, MM SW-1, and APM BIO-7 in order to reduce impacts to soil erosion or loss of topsoil to a less than significant level of impact. Option L would also require implementation of APM BIO-16, APM BIO-17, and APM BIO-19, as well as MM BIO-1a, MM BIO-1b, MM BIO-1c, and MM BIO-2a, in order to reduce impacts to soils and vegetative cover to a less than significant level. In addition, Option L would implement the SWPPP BMPs that prevent water pollution. Similar to the proposed Project, impacts to agricultural productivity, soil erosion and topsoil, vegetative cover, release of substances into the environment, and levee or levee system would be less than significant (Class III) under Option L.

Geologic impacts of Option L would be similar to the proposed project. Similar to the proposed Project, Option L would be located approximately 32 miles from the Great Valley fault and almost 23 miles from the Dunnigan Hills Fault. As discussed in Impact GEO-1, the Great Valley Fault and the Dunnigan Hills Fault are considered active. Similar to the proposed Project, impacts for known earthquake faults / ground motion associated with Option L would be potentially significant (Class II). Implementation of MM GEO-1 would be required to reduce impacts to less than significant.

Option L would have similar potential impacts to the proposed Project.

Table 4.6-7: Comparison of Alternatives for Geology and Soils

Alternative	Comparison with Proposed Project
No Project	No Impacts
Option A	Slightly Greater Impacts
Option B	Slightly Greater (soils) / Similar (geologic) Impacts
Option C	Slightly Greater (soils) / Similar (geologic) Impacts
Option D	Slightly Greater (soils) / Similar (geologic) Impacts
Option E	Slightly Greater (soils) / Similar (geologic) Impacts
Option F	Similar Impacts
Option G	Similar Impacts
Option H	Slightly Fewer (soils) / Similar (geologic) Impacts
Option I	Slightly Greater (soils) / Similar (geologic) Impacts
Option J	Similar Impacts
Option K	Similar Impacts
Option L	Similar Impacts

Source: Michael Brandman Associates 2009.

The comparative analysis of the options to the proposed Project focuses on the only difference between them on geology and soils issues, which is agricultural productivity. Therefore, the options are similar to the proposed Project for all significance criteria except agricultural productivity.

4.6.7 Cumulative Projects Impact Analysis

The cumulative environment for geology and soils includes the Project area. Other projects within this Project's vicinity that would potentially have a geology and soils cumulative effect include: the Sutter Pointe Specific Plan, new road construction in Sutter County, the Placer Vineyards Specific Area Plan, the Sierra Vista Specific Plan, and the Natomas Levee Improvement Plan. Concurrent with the proposed Project, the construction of these projects could result in an overall increase of potential affects to geology and soils within the cumulative environment.

There would be no cumulative impacts from ground motion, liquefaction, or settlement, or earthquake faults, or associated damage. That is because the proposed Project and the other projects listed above are not in active earthquake fault zones.

There would be no cumulative impacts from soil erosion or soil settlement because the proposed Project would minimize those impacts, as would the other projects as part of their permitting and construction process.

There would be an adverse cumulative impact to agricultural productivity due to permanent conversion of agricultural lands to other uses in some of the above Projects. The proposed Project would have only short-term temporary impacts on agricultural productivity due to impacts on soils.

The Natomas Levee Improvement Plan is the only project that would include potential impacts to levees on the Sacramento River as a result of proposed levee improvements. The Natomas Levee Improvement Plan includes raising, reinforcing, and reshaping existing levees. The proposed Project would employ HDD methodologies in the crossing of the Sacramento River and its major tributaries, thereby avoiding any direct impacts to those levees.

Climate change may also have a cumulative effect on soils. Snow pack in the mountains is expected to decrease, and may subsequently lead to a decrease in streamflow (Climate Action Team [CAT] Report March 2006) in the area of this

Project. The potential decrease in streamflows and therefore flooding would result in a lower risk of soil erosion.

4.6.8 Summary of Impacts and Mitigation Measures

The proposed pipeline would cross three faults, the Great Valley, Dunnigan Hills, and Willows faults. The Project area is subject to ground shaking due to earthquakes. The Project could be exposed to ground motion due to a seismic event or any resulting phenomenon such as liquefaction or settlement that could substantially damage structural components. There is also a potential for liquefaction to occur along portions of the pipeline alignment as a result of ground shaking during earthquakes. These potential impacts would be reduced to less than significant with the implementation of Mitigation Measure GEO-1. Table 4.6-8 summarizes the impacts and mitigation measures for geology and soils.

Table 4.6-8: Summary of Geology and Soils Impacts and Mitigation Measures

Impact	Mitigation Measure
GEO-1. Known Earthquake Faults/Ground Motion	**GEO-1.** Site Specific Seismic Field Investigation
Source: Michael Brandman Associates 2009.	

4.7 HAZARDS AND HAZARDOUS MATERIALS

This Section describes the environmental setting and impacts related to hazards and hazardous materials. For the purposes of this analysis, the term "hazards" refers to risk associated with such issues as fires, explosions, exposure to hazardous materials and interference with emergency response plans, etc. Information in this Section is based on Environmental Site Assessments prepared by Hanover Environmental Services, Inc. in June and August 2008 (Appendix H-1 and H-2) and on the System Safety and Risk of Upset Report prepared by EDM Services, Inc. in April 2009 (Appendix H-3).

The term "hazardous material" is defined in different ways for different regulatory programs. For this analysis, "hazardous material" is defined by the California Health and Safety Code, section 25501: "because of their quantity, concentration, or physical or chemical characteristics, (they) pose a significant present or potential hazard to human health and safety or to the environment if release into the workplace or the environment."

"Hazardous waste" is a subset of hazardous materials. For this analysis, "hazardous waste" is defined by the California Health and Safety Code, section 25517, and in the California Code of Regulations, Title 22, section 66261.2: "because of their quantity, concentration, or physical or chemical characteristics, may either cause, or significantly contribute to an increase in mortality or an increase in serious illness, or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed."

4.7.1 Environmental Setting

During construction of the Project, hazardous materials would be used, stored, handled, and disposed. Motorized vehicles would be used on the Project site. These vehicles contain numerous substances, that when released, could constitute a hazardous substance. They include gasoline, diesel, antifreeze, lubricants, and motor oil. The refueling and maintenance of these vehicles must also be considered during Project staging and operation.

The proposed Project pipeline would be located within one-half mile of 23 identified hazardous materials sites or underground storage locations (Appendix H-1). These sites are on lists compiled in accordance with Government Code section 65962.5 (PG&E 2007a). In addition, much of the proposed pipeline alignment is located along primarily cultivated agricultural fields. Due to the agricultural nature of the area, several aboveground storage tanks containing diesel and/or gasoline are located along the route and appear to be used in conjunction with irrigation pumps. Several residences, grain storage facilities, and commercial land uses along the route also maintain aboveground diesel and/or gasoline tanks for equipment refueling, as well as small quantities of chemicals or other substances for cleaning or maintenance purposes.

Therefore, contaminated soil and/or ground water may be encountered during construction along the Project alignment. If these materials are removed, they may be reclassified as hazardous materials if chemical concentrations exceed State and Federal limits that characterize materials as hazardous substances. The hazardous materials sites and underground storage tank locations located nearest the proposed Project and the status of these sites are depicted in Tables 4.7-1 and 4.7-2.

Table 4.7-1: Sites Identified within One-half Mile of Line 406

Identified Site	Status	Distance from Line 406
David Hatanka Farming 13605 County Road 88 Esparto, CA 95627	One permitted underground storage tank; no spills or releases reported	Approximately 0.25 mile south
Mast & Son 15455 Gottlob Mast Way Esparto, CA 95627	One permitted underground storage tank; no spills or releases reported	Approximately 0.06 mile south
Cache Creek High School 14320 2nd Street Yolo, CA 95697	One permitted underground storage tank; no spills or releases reported	Approximately 0.25 mile south
Half Moon Fruit & Produce 14260 Cacheville Road Yolo, CA 95697	One permitted underground storage tank; no spills or releases reported	Approximately 0.5 mile south
Clarks 14110 Cacheville Road Yolo, CA 95697	One permitted underground storage tank; no spills or releases reported	Approximately 0.5 mile south
Herr Jack 37493 Sacramento Street Yolo, CA 95697	One permitted underground storage tank; no spills or releases reported	Approximately 0.5 mile south
Gas Dehydration Station	Contains several above-ground storage tanks	Along County Road 17
Source: Hanover 2008, PG&E 2007a, PG&E 2007b.		

Table 4.7-2: Sites Identified within One-half Mile of Line 407

Identified Site	Status	Distance from Line 407
6405 Fiddyment Road Roseville, CA 95678	A diesel leak was reported in 1992 and affected soil only	Approximately 0.5 mile
Baseline Rd at Watt Ave. Roseville, CA 95678	A spill occurred on May 8, 1989 and cleaned up the same date	Within 0.125 mile
6400 Baseline Road Roseville, CA	Organic solid waste found and disposed at a landfill	Within 0.125 mile
10550 Lowell Street Roseville, CA	Remediation is currently in progress for Polyethylene Terephthalate, volatile organic compounds, Methyl Tertiary Butyl Ether, Toluene, and Xylene	Approximately 0.5 mile
Meyer Food Store 8000 Pleasant Grove Road Elverta, CA 95626	Site contains a 10,000-gallon unleaded fuel tank, which has been in place since 1992	Within 0.125 mile
Farm Air Flying Service 4425 W. Riego Road Sacramento, CA 95387	1.35 tons of organic solid have been disposed of in landfills. One active underground storage tank at this facility; seven total tanks recorded on property	Within 0.125 mile
North Side of Riego Road near Pacific Avenue Pleasant Grove, CA 95668	Two spill Incidents (unknown substance) in August 1988 and August 1989	Within 0.125 mile
Cornelius Airstrip Riego Road/Pacific Avenue Pleasant Grove, CA 95668	May have historical contamination and may require further investigation	Within 0.25 mile
Nextel Communications 8000 Crowder Lane Roseville, CA 95747	Listed by Placer County as a contaminated site	Approximately 0.33 mile
Verizon Wireless 8000 Crowder Lane Roseville, CA 95747	Listed by Placer County as a contaminated site	Approximately 0.33 mile
Surewest 8000 Crowder Lane Roseville, CA 95747	Listed by Placer County as a contaminated site	Approximately 0.33 mile
MCI Telecommunications 3387 Riego Road Pleasant Grove, CA 95668	Small quantity hazardous materials generator; one registered underground storage tank; no spills or releases reported	Within 0.25 mile

Identified Site	Status	Distance from Line 407
El Rio Farms 5341 W. Riego Road Sacramento, CA 95837	Underground storage talk location; no spills or releases reported	Within 0.33 mile
County Rd 17 & County Rd 103 Woodland, CA	The site incurred a diesel spill in 1988 as a result of vandalism	Within 0.125 mile
Ashley Payne Farms County Rd 102 & County Rd 17 Woodland, CA	One tank of regular fuel for farm use; no spills or releases reported	Approximately 0.5 mile
SMUD Elverta/Power Line Roads Sacramento, CA	One hydraulic oil spill in 1990. Groundwater was affected, and remediation action was taken	Within 0.125 mile
Source: Hanover 2008, PG&E 2007a, PG&E 2007b.		

The transportation of natural gas by pipeline involves some risk to the public in the event of an accident and subsequent release of gas. The greatest potential hazard is an explosion within an enclosed space or fire following a major rupture in the pipeline. Methane, the primary component of natural gas, is colorless, odorless, and tasteless. Methane has an auto-ignition temperature of 1,166 degrees Fahrenheit (^{o}F) and is flammable at concentrations between 5 and 15 percent by volume in air. Flammable concentrations of methane within an enclosed space in the presence of an ignition source can explode. Methane is buoyant at atmospheric temperatures and disperses rapidly in air; as such, unconfined mixtures of methane in air are flammable but rarely explosive. The risk of leakage is the normal type of risk encountered with natural gas pipelines. Leaks may expose sensitive populations to methane. It is not toxic but is classified as a simple asphyxiant, posing a slight inhalation hazard. If inhaled in high concentration, oxygen deficiency can occur, resulting in serious injury or death. Proper design, construction, and maintenance of the pipeline would minimize leaks. The pipeline would be buried along its entire length, except at metering stations, regulation stations, and pressure limiting stations, which would be fenced to prevent access.

Sensitive Receptors

People who are sensitive to air pollution include children, the elderly, and persons with preexisting respiratory or cardiovascular illness. For purposes of CEQA, the California Air Resources Board (CARB) considers a sensitive receptor to be a location that houses or attracts children, the elderly, people with illnesses, or others who are especially sensitive to the effects of air pollutants. Examples of sensitive receptors include hospitals, residences, convalescent facilities, schools, and parks. No hospitals or convalescent facilities are located within one mile of the Project area.

Yolo County contains the largest section of the pipeline, which would pass within proximity (one-half mile) to multiple individual rural residences dispersed throughout the length of the Yolo County portion of the pipeline. Of specific note are the clusters of approximately 10 rural residences in the Hungry Hollow area located on CR-17 between CR-87 and CR-88A (Class 1); approximately six rural residences in the Dunnigan Hills area (Class 1); and approximately 15 rural residences northeast of the unincorporated community of Yolo (Class 2).

Within Sutter County there are approximately 10 rural residences on Riego Road (along which the pipeline would travel) between the Sacramento River and Natomas Road (Class 1). Further east on Riego Road, between Natomas Road and the Sutter/Placer County boundary, there is an area of multiple semi-rural residences (Class 2).

Within Sacramento County there are no identified sensitive receptors currently located along the Powerline Road Distribution Feeder Main (DFM) portion of the pipeline. The proposed Powerline Road DFM (Class 3) lies along the eastern edge of Sacramento Metropolitan Airport. The DFM is intended to serve commercial, light manufacturing, and traveler services at the Metro Air Park development when it is built.

Within Placer County there are approximately 24 residences along Baseline Road within one-half mile of the proposed pipeline route (Class 2). The pipeline's eastern terminus is located adjacent to areas consisting of suburban residences within the City of Roseville limits (Class 2). The Alpha School (historical) is approximately 0.5 mile north of Line 407 along Baseline Road, and the Coyote Ridge Elementary School is approximately 0.4 mile north-northeast of the eastern terminus of Line 407 at the intersection of Baseline Road and Fair Oaks Boulevard. The Line 407 is intended to serve the Placer Vineyards Specific Plan (approved by Placer County Board of Supervisors on July 16, 2007), the Sierra Vista Specific Plan (still in the planning stage), and the Curry Creek Community Plan (put on hold). Within the approved Placer Vineyards Specific Plan are residential uses and seven dedicated school sites that will be developed by the Center Joint Unified School District. The closest planned school sites to the pipeline include a high school site within the Placer Vineyards Specific Plan located adjacent to Baseline Road, within 50 feet south of the proposed Project pipeline, and an elementary school site located approximately 1,400 feet south of the proposed Project pipeline. The Sierra Vista Specific Plan proposed land use plan includes five dedicated school sites that will be developed by the Center Joint Unified School District. The closest proposed schools sites to the proposed pipeline is an elementary school site within the Sierra Vista Specific Plan located approximately 1,500 feet north of the proposed Project pipeline.

Release Probability

This analysis uses data from reportable gas pipeline incidents nationwide to evaluate the causes and probability of accidents. Since February 9, 1970, 49 CFR Part 191 has required all operators of transmission and gathering systems to notify the U.S. Department of Transportation (DOT) of any reportable incident and to submit a report on form F7100.2 within 20 days. Reportable incidents have the following characteristics:

- Caused a death or personal injury requiring hospitalization;
- Required taking any segment of transmission line out of service;
- Resulted in gas ignition;
- Caused estimated damage to the property of the operator or others, of a total of $5,000 or more;
- Required immediate repair on a transmission line;
- Occurred while testing with gas or another medium; or
- In the judgment of the operator was significant, even though it did not meet the above criteria.

Since June 1984, the DOT requires operators only to report incidents that involve property damage of more than $50,000, injury, death, release of gas, or that are otherwise considered significant by the operator. Table 4.7-3 presents a summary of incident data for the periods from 1970 to 1984 and from 1986 to 2001, owing to the change in reporting requirements. The 14.5-year period from 1970 through June 1984 includes more basic report information than subsequent years, and as such has been subject to detailed analysis as discussed in the remainder of the analysis.

Table 4.7-3: Industry Service Incidents by Cause per 1,000 Miles/Year (percentage)

Cause of Incident	1970 to 1984	1986 to 2001
Outside forces	54%	40%
Corrosion	17%	23%
Construction or material defect	21%	14%
Other	8%	23%
Source: Entrix, Inc. 2004.		

The dominant incident cause is outside forces, constituting 54 percent of all service incidents between 1970 and 1984. Outside forces include impact by mechanical equipment, such as bulldozers and backhoes; earth movements due to soil settlement, washouts, or geological hazards; weather effects, such as winds, storms, and thermal strains; and willful damage.

During this 14.5-year period, 5,862 service incidents were reported over approximately 300,000 total miles of natural gas transmission and gathering systems nationwide. Of the 5,862 incidents, 20 incidents resulted in fatalities, 191 incidents resulted in injuries, and 22 incidents involved both fatalities and injuries. While the total number of incidents equals more than one incident per day, the total number of deaths in this period was 74, and the total number of injuries was 438; or five deaths and 30 injuries per year during this period. Service incidents, defined as failures that occur during pipeline operation, remained nearly constant over this period with no clear upward or downward trend in annual totals.

During the next 15-year period between 1984 and 2001 there were 2,845 incidents resulting in 1,523 injuries and 340 fatalities. As in the earlier data, the primary cause of the incidents are similar, namely damage by outside forces, which accounted for nearly 60 percent of the incidents.

Since April 1982, operators have been required to participate in One-Call public utility programs in populated areas, to minimize unauthorized excavation activities in the vicinity of pipelines. The One-Call program is a service used by public utilities and some private sector companies, for example, oil pipelines and cable television, to provide pre-construction information to contractors or other maintenance workers on the underground location of pipes, cables, and culverts.

Older pipelines have a higher frequency of outside forces incidents, partly because their location may be less well known and less well marked than newer lines. In addition, the older pipelines contain a disproportionate number of smaller diameter pipelines, which have a greater rate of outside forces incidents. Small-diameter pipelines are more easily crushed or broken by mechanical equipment or earth movements.

The frequency of service incidents strongly depends on pipeline age. While pipelines installed since 1950 exhibit a nearly constant level of service incident frequency, pipelines installed before that time have a significantly higher rate, partially due to corrosion. Older pipelines have a higher frequency of corrosion incidents, since corrosion is a time-dependent process. Further, more advanced coatings and cathodic protection to reduce corrosion potential are generally used on newer pipe.

Table 4.7-4 shows corrosion by level of control, and demonstrates the effectiveness of corrosion control in reducing the incidence of failures caused by external corrosion. The use of both an external protective coating and a cathodic protection system, required on all pipelines installed after July 1971, significantly reduces the rate of failure compared to unprotected or partially protected pipe. Although the data show that bare, cathodically protected pipe has a higher corrosion rate than unprotected pipe, this observation reflects the retrofitting of cathodic protection to actively corroding spots on pipes. The new pipe that would be installed by the Project would also have protective coating and a cathodic protection system.

Table 4.7-4: External Corrosion by Level of Control (1970 to 1984)

Corrosion Control	Incidents per 1,000 miles/year
None - bare pipe	0.42
Cathodic protection only	0.97
Coated only	0.40
Coated and cathodic protection	0.11
Source: Entrix, Inc. 2004.	

Pipeline Accident Data

The service incidents summarized in Table 4.7-3 include pipeline failures of all magnitudes with widely varying consequences. About two-thirds of the incidents were classified as leaks; the remaining one-third was classified as ruptures, implying a more serious failure.

Most unintentional natural gas releases are small and do not cause injury or death. Only under the right conditions will leaks and ruptures result in fire and/or explosions causing injuries and/or fatalities. A fire could result when the natural gas has a sufficient mixture with air or combustible range, 5 to 15 percent methane in air. Another requirement is an ignition source with sufficient heat to ignite the air/natural gas mixture. In order for an explosion to occur the natural gas vapor cloud must be confined (EDM Services, Inc. 2009).

Between January 1, 2002 and December 31, 2007 there were 520 transmission pipeline incidents reported to the USDOT. Of those incidents 10.8 percent resulted in fires while 6.7 percent resulted in explosions (EDM Services, Inc. 2009).

Fatalities or injuries occurred in 4 percent of the service incidents reported in the 14.5-year period from 1970 through June 1984. Between 1984 and 2001 the total annual average fatalities were 3.1 per year for onshore pipeline. The simplified reporting requirements in effect after June 1984 do not differentiate between employees and non-employees.

Nevertheless, the average of 3.1 public fatalities per year is relatively small considering the approximately 300,000 miles of transmission and gathering lines in service nationwide, resulting in an annual risk of fatality by gas transmission and gathering lines of approximately 1×10^{-5} (Entrix, Inc. 2007).

4.7.2 Regulatory Setting

The storage and use of hazardous materials and regulated substances are governed by Federal, State, and local laws. Applicable laws and regulations address the use and storage of hazardous materials to protect the environment from contamination, and to protect facility workers and the surrounding community from exposure to hazardous and regulated substances.

Federal

Pipeline Regulations

The DOT provides oversight for the nation's natural gas pipeline transportation system. Its responsibilities are promulgated under Title 49, United States Code (USC) Chapter 601. The Pipeline and Hazardous Materials Safety Administration (PHMSA), Office of Pipeline Safety (OPS), administers the national regulatory program to ensure the safe transportation of gas and other hazardous materials by pipeline.

Two statutes provide the framework for the Federal pipeline safety program. The Natural Gas Pipeline Safety Act of 1968 as amended (NGPSA) authorizes the DOT to regulate pipeline transportation of natural (flammable, toxic, or corrosive) gas and other gases as well as the transportation and storage of liquefied natural gas (LNG).

Similarly, the Hazardous Liquid Pipeline Safety Act of 1979 (HLPSA), as amended, authorizes the DOT to regulate pipeline transportation of hazardous liquids (crude oil, petroleum products, anhydrous ammonia, and carbon dioxide). Both of these Acts have been recodified as 49 USC Chapter 601.

The OPS shares portions of this responsibility with State agency partners and others at the Federal, State, and local levels. The State of California is certified under 49 USC Subtitle VIII, Chapter 601, section 60105. The State has the authority to regulate intrastate natural and other gas pipeline facilities. The California Public Utilities Commission (CPUC) is the agency authorized to oversee intrastate gas pipeline facilities, including those proposed by PG&E. The CPUC has rules governing design construction, testing, operation, and maintenance of gas gathering, transmission, and distribution piping systems (General Order No. 112-E). The California State Fire Marshal has jurisdiction for hazardous liquid pipelines.

The Federal pipeline regulations are published in Title 49 of CFR 26, Parts 190 through 199. 49 CFR 192 specifically addresses natural and other gas pipelines. Many of these pipeline regulations are written as performance standards. These regulations set the level of safety to be attained and allow the pipeline operator to use various technologies to achieve the desired result.

The proposed transmission pipeline and ancillary facilities would be designed, constructed, operated, and maintained in accordance with 49 CFR 192.

Since these are intrastate facilities, the CPUC would have the responsibility of enforcing the Federal and State requirements. 49 CFR 192 is comprised of 15 subparts, which are summarized below:

Subpart A, General - This subpart provides definitions, a description of the class locations used within the regulations, documents incorporated into the regulation by reference, conversion of service requirements, and other items of a general nature.

Subpart B, Materials - This subpart provides the requirements for the selection and qualification of pipe and other pipeline components. Generally, it covers the manufacture, marking, and transportation of steel, plastic, and copper pipe used in gas pipelines and distribution systems.

Subpart C, Pipe Design - This subpart covers the design (primarily minimum wall thickness determination) for steel, plastic, and copper pipe.

Subpart D, Design of Pipeline Components - This subpart provides the minimum requirements for the design and qualification of various components (e.g. valves, flanges, fittings, passage of internal inspection devices, taps, fabricated components, branch connections, extruded outlets, supports and anchors, compressor stations, vaults, overpressure protection, pressure regulators and relief devices, instrumentation and controls, etc.

Subpart E, Welding of Steel Pipelines - This subpart provides the minimum requirements for welding procedures, welder qualification, inspection, and repair/replacement of welds in steel pipeline systems.

Subpart F, Joining of Materials Other Than by Welding - This subpart covers the requirements for joining, personnel and procedure qualification, and inspection of cast iron, ductile iron, copper, and plastic pipe joints.

Subpart G, General Construction Requirements for Transmission Lines and Mains - This subpart provides the minimum construction requirements, including, but not limited to: inspection of materials, pipe repairs, bends and elbows, protection from hazards, installation in the ditch, installation in casings, underground clearances from other substructures, and minimum depth of cover.

Subpart H, Customer Meters, Service Regulators and Service Lines - This subpart prescribes the minimum requirements for these components.

Subpart I, Requirements for Corrosion Control - This subpart provides the minimum requirements for cathodic protection systems, required inspections and monitoring, remedial measures, and records maintenance.

Subpart J, Testing Requirements - This subpart prescribes the minimum leak and strength test requirements.

Subpart K, Uprating - This subpart provides the minimum requirements for increasing the maximum allowable operating pressure.

Subpart L, Operations - This subpart prescribes the minimum requirements for pipeline operation, including: procedure manuals, change in class locations, damage prevention programs, emergency plans, public awareness programs, failure investigations, maximum allowable operating pressures, odorization, tapping, and purging.

Subpart M, Maintenance - This subpart prescribes the minimum requirements for pipeline maintenance, including: line patrols, leakage surveys, line markers, record keeping, repair procedures and testing, compressor station pressure relief device inspection and testing, compressor station storage of combustible materials, compressor station gas detection, inspection and testing of pressure limiting and regulating devices, valve maintenance, prevention of ignition, etc.

Subpart N, Qualification of Pipeline Personnel - This subpart prescribes the minimum requirements for operator qualification of individuals performing covered tasks on a pipeline facility.

Subpart O, Pipeline Integrity Management - This subpart was promulgated on December 15, 2003. It requires operators to implement pipeline integrity management programs on the gas pipeline systems.

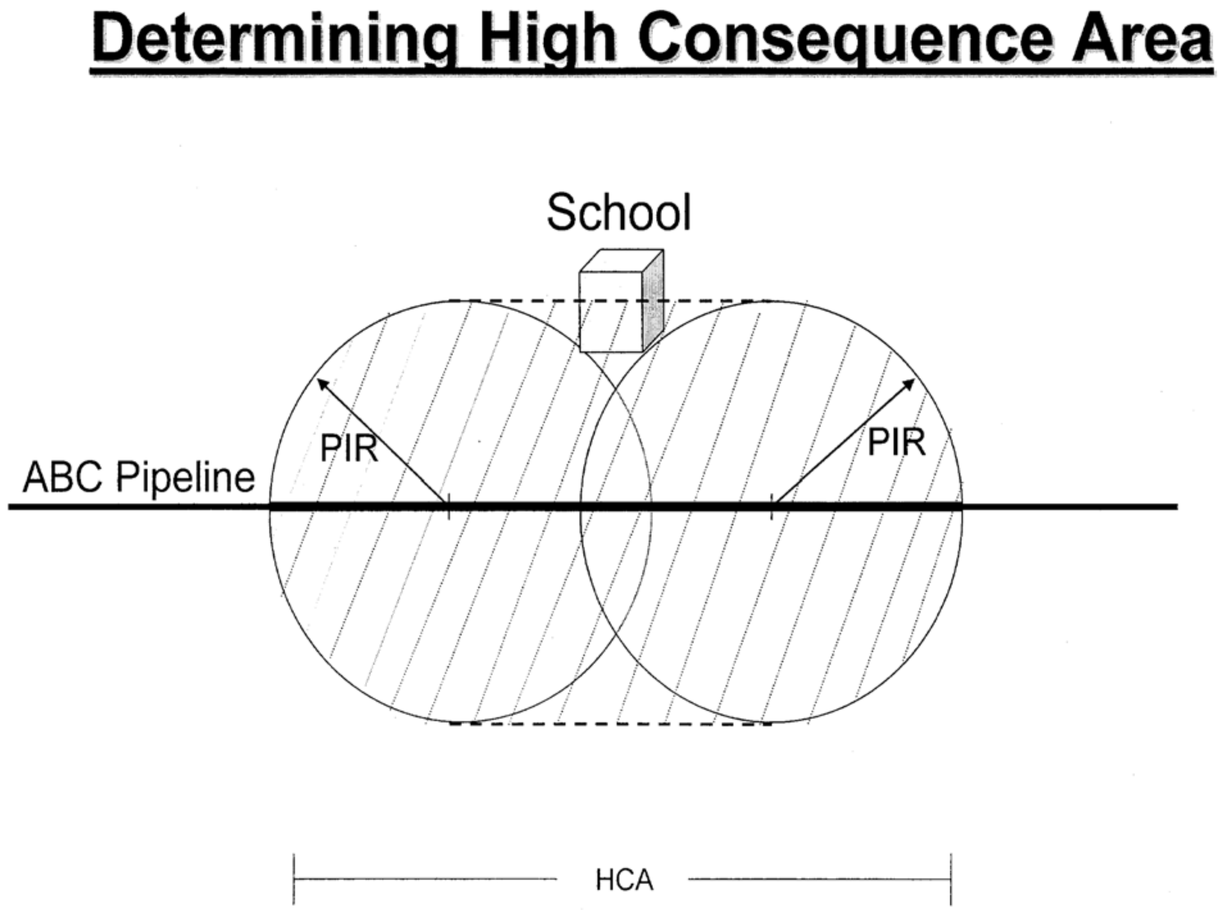
High Consequence Areas

In general, the requirements of the Federal regulations become more stringent as the human population density increases. To this end, 49 CFR 192 defines area classifications, based on population density in the vicinity of a pipeline and specifies more rigorous safety requirements for more heavily populated areas. The class location is an area that extends 660 feet (220 yards) on either side of the centerline of any continuous 1-mile length of pipeline. The four area classifications are defined as follows, and also discussed and shown in Table 2-2 in Section 2.0, Project Description:

- **Class 1**: A location with ten or fewer buildings intended for human occupancy;
- **Class 2**: A location with more than ten but less than 46 buildings intended for human occupancy;
- **Class 3**: A location with 46 or more buildings intended for human occupancy or where the pipeline lies within 300 feet (100 yards) of any building or small well-defined outside area occupied by 20 or more people during normal use; and
- **Class 4**: A location where buildings with four or more stories aboveground are prevalent.

Pipeline facilities located within class locations representing more populated areas are required to have a more conservative design. For example, pipelines constructed on land in Class 1 locations must be installed with a minimum depth of cover of 30 inches in normal soil and 18 inches in consolidated rock. Class 2, 3, and 4 locations, as well as drainage ditches at public roads and railroad crossings, require a minimum cover of 36 inches in normal soil and 24 inches in consolidated rock. All pipelines installed in navigable rivers, streams, and harbors must have a minimum cover of 48 inches in soil or 24 inches in consolidated rock.

Class locations also specify the maximum distance to a sectionalizing block valve (e.g., 10.0 miles in Class 1, 7.5 miles in Class 2, 4.0 miles in Class 3, and 2.5 miles in Class 4 locations). Pipe wall thickness and pipeline design pressures, hydrostatic test pressures, maximum allowable operating pressure (MAOP), inspection and testing of welds, and frequency of pipeline patrols and leak surveys must also conform to higher standards in more populated areas.



Source: 49 CFR Part 192, Appendix E; PIR = Potential Impact Radius

The DOT (68 Federal Register 69778, 69 Federal Register 18228, and 69 Federal Register 29903) defines HCAs as they relate to the different class zones, potential impact circles, or areas containing an identified site as defined in 49 CFR 192.903. The OPS published a series of rules from August 6, 2002, to May 26, 2004 (69 Federal Register 69817 and 29904), that define HCAs where a gas pipeline accident could do considerable harm to people and their property. This definition satisfies, in part, the Congressional mandate in 49 USC 60109 for the OPS to prescribe standards that establish criteria for identifying each gas pipeline facility in a high-density population area.

The HCAs may be defined in one of two ways. Both methods are prescribed by 49 CFR 192.903. The first includes:

- Current Class 3 and 4 locations;

- Any area in Class 1 or 2 locations where the potential impact radius is greater than 660 feet (200 meters) and the area within a potential impact circle contains 20 or more buildings intended for human occupancy; or
- Any area in Class 1 or 2 locations where the potential impact circle includes an “identified site.”

In the second method, an HCA includes any area within a potential impact circle that contains:

- 20 or more buildings intended for human occupancy; or
- An “identified site.”

“Identified sites” include areas such as beaches, playgrounds, recreational facilities, camp grounds, outdoor theaters, stadiums, recreational areas, religious facilities, and other areas where high concentrations of the public may gather periodically as defined by 49 CFR 192.903.

The “potential impact radius” is calculated as the product of 0.69 and the square root of the MAOP of the pipeline (in pounds per square inch gauge (psig), multiplied by the pipeline diameter in inches squared (R = 0.69*(MAOP*D*D)**0.5). The potential impact circle is a circle with a radius equal to the potential impact radius.

Once a pipeline operator has identified the HCAs along its pipeline(s), it must apply the elements of its integrity management program to those segments of the pipeline within the HCAs. The pipeline integrity management rule for HCAs requires inspection of the entire pipeline within HCAs every seven years. Using this calculation, the impact radii are 646 feet and 215 feet for the 30-inch and 10-inch segments respectively. These values are less than the 660-foot impact radius, which would require that additional portions be added to an HCA.

Pipeline Integrity Management Regulations

49 CFR 192 Subpart O, Pipeline Integrity Management was established following a series of pipeline incidents with severe consequences. This subpart requires operators of gas pipeline systems in High Consequence Areas (HCAs) to significantly increase their minimum required maintenance and inspection efforts. For example, all lines located within HCAs must be analyzed by conducting a baseline risk assessment. In general, the integrity of the lines must also be evaluated using an internal inspection device or a direct assessment, as prescribed

in the regulation. Two incidents in particular that are discussed below raised public concern regarding pipeline safety and necessitated these relatively new requirements.

Bellingham, Washington, June 10, 1999. According to the National Transportation Safety Board (NTSB) accident report, "about 3:28 p.m., Pacific daylight time, on June 10, 1999, a 16-inch diameter steel pipeline owned by Olympic Pipe Line Company ruptured and released about 237,000 gallons of gasoline into a creek that flowed through Whatcom Falls Park in Bellingham, Washington. About one and one half hours after the rupture, the gasoline ignited and burned approximately one and one half miles along the creek. Two 10-year-old boys and an 18-year-old young man died as a result of the accident. Eight additional injuries were documented. A single-family residence and the City of Bellingham's water treatment plant were severely damaged. As of January 2002, Olympic estimated that total property damages were at least $45 million."

The major safety issues identified during this investigation were excavations performed by IMCO General Construction, Inc., in the vicinity of Olympic's pipeline during a major construction project and the adequacy of Olympic Pipe Line Company's inspections thereof; the adequacy of Olympic Pipe Line Company's interpretation of the results of in-line inspections of its pipeline and its evaluation of all pipeline data available to it to effectively manage system integrity; the adequacy of Olympic Pipe Line Company's management of the construction and commissioning of the Bayview products terminal; the performance and security of Olympic Pipe Line Company's supervisory control and data acquisition system; and the adequacy of Federal regulations regarding the testing of relief valves used in the protection of pipeline systems" (NTSB 2002).

Carlsbad, New Mexico, August 19, 2000. Per the NTSB accident report, "At 5:26 a.m., mountain daylight time, on Saturday, August 19, 2000, a 30-inch diameter natural gas transmission pipeline operated by El Paso Natural Gas Company ruptured adjacent to the Pecos River near Carlsbad, New Mexico. The released gas ignited and burned for 55 minutes. Twelve persons who were camping under a concrete-decked steel bridge that supported the pipeline across the river were killed and their three vehicles destroyed. Two nearby steel suspension bridges for gas pipelines crossing the river were extensively damaged. According to El Paso Natural Gas Company, property and other damages or losses totaled $998,296."

The major safety issues identified in this investigation were the design and construction of the pipeline, the adequacy of El Paso Natural Gas Company's internal corrosion control program, the adequacy of Federal safety regulations for natural gas pipelines, and the adequacy of Federal oversight of the pipeline operator" (NTSB 2003).

As noted earlier, 49 CFR 192, Subpart O, Pipeline Integrity Management is relatively new and was developed in response to the two major pipeline incidents discussed above. To strengthen pipeline safety laws, the Pipeline Safety Improvement Act of 2002 (HR 3609) was passed by Congress on November 15, 2002, and was signed into law by the President in December 2002. As of December 17, 2004, gas transmission operators of pipelines in HCAs were required to develop and follow a written integrity management program, which contained all of the elements prescribed in 49 CFR 192.911 and addressed the risks on each covered transmission pipeline segment.

Hazardous Materials

Several Federal agencies regulate hazardous materials, including the U.S. Environmental Protection Agency (EPA), the Occupational Safety and Health Administration (OSHA), and the DOT. Applicable Federal regulations are contained primarily in Titles 10, 29, 40, and 49 of the CFR. Lead exposure guidelines are provided by the U.S. Department of Housing and Urban Development.

Worker Safety

The DOT requires that gas pipeline operators meet certain qualifications. For the proposed Project, construction crews are not required to meet these qualifications because they are not considered gas pipeline operators. However, when the proposed pipeline is connected to the main gas transmission system, PG&E's operators would be subject to the DOT qualifications.

Hazardous Materials Transportation

The DOT has developed regulations pertaining to the transport of hazardous materials and hazardous wastes by all modes of transportation. The DOT regulations specify packaging requirements for different types of materials. The EPA has also promulgated regulations for the transport of hazardous wastes. These more stringent requirements include tracking shipments with manifests to ensure that wastes are delivered to the intended destination.

State

Pipeline Regulations

As noted earlier, intrastate pipeline facilities such as those that would be associated with the proposed Project would be under the jurisdiction of the CPUC, as a result of their certification by the OPS. (The State of California is certified under 49 USC Subtitle VIII, Chapter 601, section 60105.) The State requirements for designing, constructing, testing, operating, and maintaining gas piping systems are stated in CPUC General Order Number 112E. These rules incorporate the Federal regulations by reference.

Other Pipeline Guidelines

In addition to all other applicable Federal and State codes and regulations and industry standards for pipeline design, the CSLC requires that the pipeline design also meet the requirements of current seismological engineering standards such as the “Guidelines for the Design of Buried Steel Pipe” by American Lifeline Alliance and "The Guidelines for the Seismic Design and Assessment of Natural Gas and Liquid Hydrocarbon Pipelines" by the Pipeline Research Council International, Inc. The CSLC also requires that all engineered structures, including pipeline alignment drawings, profile drawings, buildings and other structures, and other appurtenances and associated facilities, to be designed, signed, and stamped by California registered professionals certified to perform such activities in their jurisdiction.

Hazardous Materials

The California Environmental Protection Agency (CalEPA) establishes regulations governing the use of hazardous materials in the State. The Office of Emergency Services (OES) coordinates State and local agencies and resources for educating, planning, and warning citizens of hazardous materials and hazardous materials emergencies, including organized response efforts in case of emergencies. The California Highway Patrol (CHP) and the California Department of Transportation (Caltrans) are the State enforcement agencies for hazardous materials transportation regulations. Transporters of hazardous materials and waste are responsible for complying with all applicable packaging, labeling, and shipping regulations.

<u>Department of Toxic Substances Control</u>

Within CalEPA, the Department of Toxic Substances Control (DTSC) has primary regulatory responsibility for hazardous waste management and cleanup. Requirements place “cradle-to-grave” responsibility for hazardous waste disposal on the shoulders of hazardous waste generators. Generators must ensure that their wastes are disposed of properly, and legal requirements dictate the disposal requirements for many waste streams (e.g., banning many types of hazardous wastes from landfills). Enforcement of regulations has been delegated to local jurisdictions that enter into agreements with the DTSC for the generation, transport, and disposal of hazardous materials under the authority of the Hazardous Waste Control Law. State regulations applicable to hazardous materials are contained in Title 22 of the California Code of Regulations (CCR). Title 26 of the CCR is a compilation of those sections or titles of the CCR that are applicable to hazardous materials management. Title 8 of the CCR contains Construction Safety Orders pertaining to lead.

<u>Hazardous Materials Management Plans</u>

In January 1996, the CalEPA adopted regulations implementing a “Unified Hazardous Waste and Hazardous Materials Management Regulatory Program” (Unified Program). The six program elements of the Unified Program are: (1) hazardous waste generators and hazardous waste on-site treatment; (2) underground storage tanks; (3) aboveground storage tanks; (4) hazardous material release response plans and inventories; (5) risk management and prevention program; and (6) Uniform Fire Code hazardous materials management plans and inventories. The program is implemented at the local level by a local Certified Unified Program Agency (CUPA), which is responsible for consolidating the administration of the six program elements within its jurisdiction. The Yolo County Environmental Health Department, Sacramento County Environmental Management Department, Placer County Environmental Health Division, and Sutter County Environment Health Services are the CUPAs that serve the proposed Project area.

State and Federal laws require detailed planning to ensure that hazardous materials are properly handled, used, stored, and disposed of, and, in the event that such materials are accidentally released, to prevent or to mitigate injury to health or the environment. California’s Hazardous Materials Release Response Plans and Inventory Law (number four from the list above), sometimes called the “Business Plan Act,” aims to minimize the potential for accidents involving hazardous materials and to facilitate an appropriate response to possible hazardous materials emergencies. The law requires businesses that use hazardous materials to provide inventories of those materials to designated emergency response agencies, to illustrate on a diagram where the materials are stored on-site, to prepare an emergency response plan, and to train employees to use the materials safely.

Worker Safety

Occupational safety standards exist in Federal and State laws to minimize worker safety risks from both physical and chemical hazards in the workplace. The California Division of Occupational Safety and Health (CalOSHA) is responsible for developing and enforcing workplace safety standards and assuring worker safety in the handling and use of hazardous materials. Among other requirements, CalOSHA obligates many businesses to prepare Injury and Illness Prevention Plans and Chemical Hygiene Plans. The Hazard Communication Standard requires that workers be informed of the hazards associated with the materials they handle. For example, manufacturers are to appropriately label containers, Material Safety Data Sheets are to be available in the workplace, and employers are to properly train workers.

Department of Forestry

The greatest potential for fire occurs with the use of internal combustion engines, including driving construction trucks and equipment on grass covered areas. The California Department of Forestry (CDF) requires the use of spark arrestors on all internal combustion engines.

In addition, work that involves flame, arcing, or sparking equipment, such as welding, at the construction staging areas during construction of the pipeline could potentially result in the combustion of native materials located close to the site. The CDF requires that PG&E would select a welding site that is void of native combustible material and/or clearing such material for 10 feet around the area where the work is to be performed.

Local

Yolo County Environmental Health Department

The Yolo County Environmental Health Department is responsible for identifying, assessing, mitigating, and preventing environmental hazards. It oversees the cleanup and removal of hazardous waste within the county and acts as the local CUPA. The Yolo County Environmental Health Hazmat Unit responds to industrial and chemical spills, fuel spills resulting from vehicle accidents, chemical leaks due to natural disasters, terrorist acts, bomb threats, abandoned waste, and radiological releases. The Hazmat Unit responds to these emergencies along with local fire and law enforcement agencies.

Yolo County General Plan

The Yolo County General Plan includes the following policies:

> **S-21 and S-23 Emergency Plan/Long-Term Recovery Actions:** These two policies establish the requirement for an Emergency Plan, together with the significant mitigation requirement that emergency recovery actions avoid development of long-term public problems by the application of short-term expedient measures.

> **S-12 - S-14 Fire Protections Measures:** This series of policies establishes safety mitigation as a part of the environmental protection.

> **S-18 Toxic or Hazardous Materials:** This policy specifically provides for mitigation through the development of emergency plans for implementation in the event of accident, fire, or flood involving toxic or hazardous materials.

Sacramento County Environmental Management Department

The Sacramento County Environmental Management Department (EMD) is responsible for promoting a safe and healthy environment in the county. It oversees the cleanup and removal of hazardous waste within the county and acts as the local CUPA. The EMD also provides the necessary permits required for hazardous materials storage and use, monitoring wells, removal of leaky underground storage tanks, and permits required for the collection, transport, use, or disposal of refuse. The EMD, local fire departments, Sacramento County Sheriff's Department, and the Department of General Services Emergency Operations Division are responsible for implementing various aspects of Sacramento County's emergency plan. The plan includes a "Hazardous Materials Incident Response Plan."

Sacramento County General Plan

The following Sacramento County General Plan goals and policies related to hazards and hazardous materials are applicable to the proposed Project and are found in the Hazardous Materials and Public Facilities elements (Sacramento County 1993 and 1997).

HM-4. The handling, storage, and transport of hazardous materials shall be conducted in a manner so as not to compromise public health and safety standards.

HM-7. Encourage the implementation of workplace safety programs and to the best extent possible ensure that residents who live adjacent to industrial or commercial facilities are protected from accidents and the mishandling of hazardous materials.

HM-10. Reduce the occurrences of hazardous material accidents and the subsequent need for incident response by developing and implementing effective prevention strategies.

HM-11. Protect residents and sensitive facilities from incidents which may occur during the transport of hazardous materials in the County.

Public Facilities Element

PF-74. Energy production and distribution facilities shall be designed and sited in a manner so as to protect the residents of Sacramento County from the effects of a hazardous materials incident.

Sutter County

Sutter County's Emergency Services Division prepares and maintains plans and conducts training programs. These programs include response to hazardous material releases. The Sutter County Fire Department includes a Hazardous Materials Response Team with equipment personnel trained to mitigate hazardous materials releases. Sutter County Environmental Health Services acts as the local CUPA.

Sutter County General Plan

The General Plan includes the following policies with regard to the treatment of hazardous materials.

7.F-1. The County shall ensure that the use and disposal of hazardous materials complies with appropriate Federal, State and local requirements.

7.F-2. The County shall maintain and implement a Sutter County Hazardous Waste Management Plan (SCHWMP) consistent with the requirements of state law.

7.F-3. Review of all proposed development projects that manufacture, use or transport hazardous materials shall be coordinated between the County and appropriate State and Federal agencies.

7.F-4. The County shall require that development proposals that will generate hazardous waste or utilize hazardous materials provide a hazardous waste business and emergency plan pursuant to state law.

Placer County

The Placer County Environmental Health Division acts as the local CUPA for all areas of the county except the City of Roseville. The Roseville Fire Department is the CUPA for the City of Roseville. The CUPA consolidates and coordinates administrative activities such as permits, inspections, and enforcement.

Placer County General Plan

The Placer County General Plan includes the following policies with regard to the treatment of hazardous materials.

8.G.1. The County shall ensure that the use and disposal hazardous materials in the County complies with local, state, and federal safety standards.

8.G.3. The County shall review all proposed development projects that manufacture, use, or transport hazardous materials for compliance with the County's Hazardous Waste Management Plan (CHWMP).

8.G.7. The County shall ensure that industrial facilities are constructed and operated in accordance with current safety and environmental protection standards.

8.G.8. The County shall require that new industries that store and process hazardous materials provide a buffer zone between the installation and the property boundaries sufficient to protect public safety. The adequacy of the buffer zone shall be determined by the County.

8.G.10. The County shall require that any business that handles a hazardous material prepare a plan for emergency response to a release or threatened release of a hazardous material.

8.G.12. The County shall identify sites that are inappropriate for hazardous material storage, maintenance, use, and disposal facilities due to potential impacts on adjacent land uses and the surrounding natural environment.

8.G.13. The County shall work with local fire protection and other agencies to ensure an adequate Countywide response capability to hazardous materials emergencies.

4.7.3 Significance Criteria

An adverse impact regarding hazards and hazardous materials is considered significant and would require mitigation if the Project would:

1. Expose people to an unacceptable risk of existing or potential hazards, including upset and accident conditions involving the risk for fires, explosions, or the release of hazardous materials into the environment;

2. Create significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;

3. Create hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste that could adversely affect existing or proposed schools, residential areas, or other sensitive receptors;

4. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan; significantly increase fire hazard in areas with flammable materials; or expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands;

5. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code section 65962.5 and, as a result, would create a significant hazard to the public or the environment; or

6. For a project located within an airport land use plan, or within two miles of a public airport or private airstrip, where the project would result in a safety hazard for people residing or working in the project area.

4.7.4 Applicant Proposed Measures

Applicant Proposed Measures (APMs) have been identified by PG&E in its Preliminary Environmental Analysis prepared for the CSLC. APMs that are relevant to this Section are presented below. This impact analysis assumes that all APMs would be implemented as defined below. Additional mitigation measures are recommended in this Section if it is determined that APMs do not fully mitigate the impacts for which they are presented.

APM HAZ-1. PG&E will establish an environmental training program to communicate environmental concerns and appropriate work practices, including spill prevention, emergency response measures, and proper BMP implementation, to all field personnel. The training program will emphasize site-specific physical conditions to improve hazard prevention (e.g., identification of potentially hazardous substances) and will include a review of all site-specific plans, including, but not limited to, PG&E's Water Quality Construction Best Management Practices (BMP) Manual and the project's Erosion Control and Sediment Transport Plan, Health and Safety Plan, Waste Characterization and Management Plan, Fire Response Plan, and Hazardous Substances Control and Emergency Response Plan. A monitoring program will also be implemented to ensure that the plans are followed throughout construction. BMPs, as identified in the Water Quality Construction Best Management Practices Manual and Erosion Control and Sediment Transport Plan, will also be implemented during the project to minimize the risk of an accidental release and provide the necessary information for emergency response.

APM HAZ-2. PG&E will prepare a Hazardous Substance Control and Emergency Response Plan, which will include preparations for quick and safe cleanup of accidental spills. This plan will be submitted with the grading permit application. It will prescribe hazardous-materials handling procedures for reducing the potential for a spill during construction, and will include an emergency response program to ensure quick and safe cleanup of accidental spills. The plan will identify areas where refueling and vehicle maintenance activities and storage of hazardous materials, if any, will be permitted.

These directions and requirements will also be reiterated in PG&E's Water Quality Construction Best Management Practices Manual.

APM HAZ-3. PG&E will use oil-absorbent material, tarps, and storage drums to contain and control any minor releases. Emergency-spill supplies and equipment will be kept adjacent to all areas of work and in staging areas, and will be clearly marked. Detailed information for responding to accidental spills and for handling any resulting hazardous materials will be provided in the project's Hazardous Substances Control and Emergency Response Plan.

APM HAZ-4. PG&E will conduct soil sampling and potholing along the project route, as needed, before construction begins, and soil information will be provided to construction crews to inform them about soil conditions and potential hazards. Due to the agricultural nature of the area, soil sampling will include analysis for pesticides, including organochlorine pesticides such as DDT and malathion.

- If hazardous substances are unexpectedly encountered during trenching, grading, or excavating work, work will be stopped until the material is properly characterized and appropriate measures are taken to protect human health and the environment. If excavation of hazardous materials is required, they will be handled, transported, and disposed of in accordance with federal, state, and local regulations.

- Prior to initiating excavation activities, soil borings will be advanced to ensure that groundwater will not be encountered. The location, distribution, or frequency of such tests shall be determined to give adequate representation of the conditions in the construction area.

- PG&E will conduct all soil sampling and hazardous-waste removal and handling in accordance with the project's Health and Safety Plan.

APM HAZ-5. If suspected contaminated groundwater is encountered in the depths of the project construction areas, PG&E will collect samples and submit them for laboratory analysis of petroleum hydrocarbons, metals, volatile organic compounds, semi-volatile organic compounds, and pesticides. If necessary, groundwater will be collected during construction, contained, and disposed of in accordance with all applicable regulations. Appropriate personal protective equipment will be used and waste management will be performed in accordance with applicable regulations. Non-contaminated groundwater will be discharged as described in Chapter 9—Hydrology and Water Quality.

- Appropriate personal protective equipment will be used during groundwater testing and water removal, and waste management and disposal will be performed in accordance with local, state, and federal regulations and per the Project's Health and Safety Plan and Waste Characterization and Management Plan.

APM HAZ-6. Prior to initiating construction, PG&E will prepare a Fire Risk Management Plan to outline the potential for fires occurring as a result of project construction, and to outline measures necessary to prevent fires. Additionally, fire-suppression materials and equipment will be kept adjacent to all areas of work and in staging areas, and will be clearly marked. Detailed information for responding to fires will be provided in the project's Fire Risk Management Plan.

- Information contained in the Fire Risk Management Plan and the location of fire-suppression materials and equipment will be included as part of the employee environmental training.

APM HAZ-7. On properties with a history of agricultural use, many underground pipelines may exist; these pipelines commonly contain asbestos. If any subsurface structures are encountered during site development or on-site excavation, care shall be exercised in determining whether or not the subsurface structures contain asbestos. If they contain asbestos, they shall be removed, handled, transported, and disposed of in accordance with applicable federal, state, and local regulations.

- If wells and/or septic tanks are uncovered during site development, they shall be abandoned and removed in accordance with federal, state, and local regulations.

APM HAZ-8. During operation, PG&E will prepare a Fire Risk Management Plan to outline the potential for fires occurring as a result of project operation, and to outline measures necessary to prevent fires. Additionally, regular inspections will be conducted of the gas pipeline to ensure activities in surrounding areas have not impacted the integrity of the pipeline or the pipeline easement. Detailed information for responding to fires will be provided in the project's Fire Risk Management Plan.

APM BIO-13. Spill Prevention/Containment and Refueling Precautions: PG&E will maintain all construction equipment to prevent leaks of fuels, lubricants, or other fluids into waterways. Appropriate materials will be on-site to prevent and manage spills. PG&E will take appropriate precaution when handling and/or storing chemicals (e.g., fuel and hydraulic fluid) near waterways and wetlands, and any and all applicable laws and regulations will be followed. Service and refueling procedures will take place at least 100 feet from waterways or in an upland area at least 100 feet from wetland boundaries to prevent spills from entering waterways or wetlands. These activities may be performed closer than 100 feet if a qualified biologist finds in advance that no reasonable alternative exists, and that PG&E and its contractors have taken the appropriate steps (including secondary containment) to prevent spills and provide prompt cleanup in the event of a spill. These measures will be outlined in a Hazardous Substance Control and Emergency Response Plan to be prepared by PG&E (See APM HAZ-2).

4.7.5 Impact Analysis and Mitigation

Impact Discussion

Contamination from Leaks, Spills, and/or the Routine Handling of Hazardous Materials

The Project would not be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code section 65962.5 and, as a result, would not create a significant hazard to the public or the environment. Impacts would be less than significant (Class III).

The Project passes within one-half mile or less of 77 sites listed under Government Code section 65962.5. However, APM HAZ-1 through APM HAZ-5 and APM HAZ-7 would ensure that impacts related to the proximity of the Project to these sites is less than significant (Class III).

Construction activities associated with the proposed Project would involve storage, transport, and handling of hazardous materials. The potential for accidental releases of hazardous materials could result from construction, operation, and maintenance activities including equipment fuel leaks, fuel spills, and other events. Construction and operation of the proposed Project would primarily occur in rural areas; however, several locations along the proposed pipeline route are within close proximity to residences and could pose a risk to public safety from exposure to any accidental releases of fuel or lubricants.

PG&E would prepare and implement a Spill Prevention, Control, and Countermeasure (SPCC) plan for the proposed Project as required by the Storm Water Pollution Prevention Plan (SWPPP) and would include action measures to minimize the potential for accidental releases of hazardous materials into the environment. The Central Valley Regional Water Quality Control Board would review and monitor the effectiveness of the SPCC and SWPPP through mandatory reporting by PG&E as required under those plans.

Although the construction areas and staging areas could contain hazardous materials, their use would be temporary and the hazardous materials used would not be considered acutely hazardous and would not be disposed of in the areas, nor would they result in hazardous emissions to any neighboring properties.

In addition, the implementation of Applicant Proposed Measures APM HAZ-1 through APM HAZ-5, as well as APM BIO-13, would reduce the risks for accidental releases of hazardous materials into the environment. Potential impacts associated with contamination due to leaks, spills, and /or the handling or storage of hazardous materials would be less than significant (Class III).

Airports

The Project is located within the airport land use plan for Sacramento International Airport and within two miles of a public airport or private airstrip, but would not result in a safety hazard for people residing or working in the Project area based on the distance to the airport (1.49 miles). Impacts would be less than significant (Class III).

The Powerline Road Distribution Feeder Main lies on the eastern edge of the northernmost portion of the Sacramento International Airport property, over 1 mile north and east of the end of the runways. The pipeline is located far enough away from the airport so as not to interfere with operations or cause risk to workers. Impacts would be less than significant (Class III).

Impact HAZ-1: Emergency Plans/Wildland Fires

The Project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan; but could expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands (Potentially significant, Class II).

During the July 2007 NOP scoping period, fires were brought up that occurred in the area as a result of a PG&E facility. The CDF identifies communities at risk from wildfires. The most recent map shows that the proposed pipeline lies outside of any identified at-risk communities. In addition, mitigation measures are proposed during construction and operations to prevent grass fires as discussed below.

During pipeline construction, the greatest potential for fire hazard comes from welding activities and using internal combustion engines or sparking equipment in grass covered areas along the Project route. The CDF regulations and local ordinances would reduce to the risk of grass fires. APM HAZ-6 and APM HAZ-8 would not adequately reduce construction impacts to less than significant because there are insufficient details in APM HAZ-6 and APM HAZ-8 to ensure that potential impacts would be minimized. As a result, MM HAZ-1 is required to be implemented during construction activities to reduce the impact of wildland fires to less than significant.

The operation phase includes a Public Safety Information Program with a Fire Response Plan. In addition, the design features that include burying the pipeline deeper than required, anti-corrosion measures, a 50-foot permanent right of way, and aboveground line markers would reduce operations phase impacts to less than significant (Class III).

<u>Mitigation Measures for Impact HAZ-1: Emergency Plans/Wildland Fires</u>

MM HAZ-1. **Minimize Risk of Fire.** During all construction activities, PG&E shall implement the following:

- Maintain all areas clear of vegetation and other flammable materials for at least a 50-foot-radius of any welding or grinding operations, or the use of an open flame;
- Spray nearby vegetation with water, using a water truck or other suitable equipment, prior to any welding or grinding operations or the use of an open flame;
- All equipment, gasoline-powered hand tools, and vehicles shall be equipped with spark arresters;
- Equip all vehicles entering the right-of-way, welding trucks or rigs with minimal fire suppression equipment (e.g., ax, bucket, 5-pound fire extinguisher, shovels, etc.);
- Park vehicles equipped with catalytic converters only in cleared areas;
- Maintain at least one half-full water truck or water tanker at each rural work site during all periods of work and for one-hour after all work has ceased for the day; and
- Require the contractor to use dedicated fire watch during all hot work within existing operational stations (e.g., Concord or Sacramento Station).

Rationale for Mitigation

Risk of fire would be reduced by the measures listed above beyond those measures covered under APM HAZ-6 and APM HAZ-8. The measures include vegetation clearance to reduce fuel during fires, use of spark arresters, use of fire suppression equipment in vehicles and equipment, parking limitations, adequate on-site water supply, and fire watch during hot work.

Impact HAZ-2: System Safety and Risk of Serious Injuries and Fatalities Due to Project Upset

The Project would expose people to an unacceptable risk of existing or potential hazards, including upset and accident conditions involving the risk for fires, explosions, or the release of natural gas into the environment (Significant, Class I).

Natural gas could be released from a leak or rupture. If the natural gas reached a combustible mixture and an ignition source was present, a fire and/or explosion could occur, result in possible injuries and/or deaths.

An unacceptable risk is defined as a one in a million (1:1,000,000) chance of a fatality (CDE 2007). During operation, there would be individual risks to building occupants, residential, commercial, and school sites, as well as to vehicle occupants. The risks would include the release of natural gas, which could reach a combustible mixture and if an ignition source was present, a fire and/or explosion could occur, resulting in possible injuries and/or deaths.

Natural gas is composed primarily of methane. If methane were to be released from the proposed Project, it would need to mix with enough oxygen to become combustible. Natural gas does not explode unless it is confined sufficiently within a specific range of mixtures with air and is ignited. Methane has an ignition temperature of 1,000 ^{o}F and is flammable at concentrations between 5 percent and 15 percent in air. Many variables affect the size of an explosion, including rate of vapor cloud formation, size of the vapor cloud within the combustible range, concentration of vapors, degree of vapor cloud confinement, and other factors.

Individual Risk of Serious Injuries or Fatalities

In the following paragraphs, the impacts related to serious injuries and fatalities are described for individuals exposed to a fire or explosion. The risks associated with Line 406 were assessed using the existing conditions. The risks associated with

Line 407 and the DFM were assessed using existing conditions, plus the impacts of the proposed land developments within Placer County, including Sutter Pointe, Placer Vineyard, Sierra Vista, and Curry Creek.

Table 4.7-5 below summarizes the calculated risks for each segment of the Project as well as the total risk from the Project. As seen in Table 4.7-5 the risk to building occupants and vehicle occupants exceeds the 1:1,000,000 acceptable risk threshold. The anticipated individual frequency of serious injury or fatality from the proposed project is approximately 6.1 x 10^{-5}. This represents a 1:16,000 likelihood of a serious injury or fatality annually, which is roughly sixty times greater than the generally accepted criteria of 1:1,000,000. The individual risks posed by each of the individual line segments are also summarized. As noted, the risk for each of the individual line segments, except Line DFM, exceeds the individual risk significance criteria. As a result the individual risk posed by the proposed Project is considered significant (Class I).

Table 4.7-5: Individual Risk Summary

	Line 406	**Line 407 E**	**Line 407 W**	**Line DFM**	**Total**
Building Occupants	1.05 X 10^{-6}	1.99 x 10^{-5}	4.54 x 10^{-6}	7.00 x 10^{-7}	2.62 x 10^{-5}
Vehicle Occupants	1.84 x 10^{-6}	2.94 x 10^{-5}	3.21 x 10^{-6}	2.06 x 10^{-7}	3.46 x 10^{-5}
Probability of Serious Injury or Fatality	2.89 x 10^{-6}	4.93 x 10^{-5}	7.75 x 10^{-6}	9.06 x 10^{-7}	6.08 x 10^{-5}
Annual Likelihood of Serious Injury or Fatality	1:350,000	1:27,000	1:130,000	1:1,100,000	1:16,000
Percentage of Total Risk to Building Occupants	4.8%	81.1%	12.7%	1.4%	100%
Source: EDM Services, Inc. 2009.					

Table 4.7-6 provides a description of the distances to various impacts should an unintentional release of natural gas occur.

Table 4.7-6: Consequence versus Distance Summary

Distance to Impact (feet)	Description of Potential Consequence
35 feet	1.0 psig overpressure from 1-inch diameter release explosion, release 45° above horizon. Windows usually shattered and occasional damage to window frames. 1 percent probability of serious injury or fatality to occupants in reinforced concrete or reinforced masonry building from flying glass and debris.
50 feet	0.7 psig overpressure from 1-inch diameter release explosion, release 45° above horizon. Minor damage to residential structures. Some injuries to those indoors due to flying debris, but very unlikely to be serious.
50 feet	8,000 btu/hr-ft^2 heat flux from 1-inch diameter release torch fire, release 45° above horizon. 50 percent mortality anticipated to those exposed.
70 feet	3,500 btu/hr-ft^2 heat flux from 1-inch diameter release torch fire, release 45° above horizon. Second degree skin burns after ten seconds of exposure.
90 feet	1,600 btu/hr-ft^2 heat flux from 1-inch diameter release torch fire, release 45° above horizon. Second degree skin burns after thirty seconds of exposure.
360 feet	Distance to lower flammability limit (flash fire boundary) from full bore release at 45° above horizon for flash fire. This would likely result in serious injury or death to those exposed to the ignited vapor cloud under typical conditions.
380 feet	1.0 psig overpressure from full bore release explosion, release 45° above horizon. Windows usually shattered and occasional damage to window frames. 1 percent probability of serious injury or fatality to occupants in reinforced concrete or reinforced masonry building from flying glass and debris.
420 feet	1.0 psig overpressure from full bore release explosion, horizontal release. Windows usually shattered and occasional damage to window frames. 1 percent probability of serious injury or fatality to occupants in reinforced concrete or reinforced masonry building from flying glass and debris.
520 feet	8,000 btu/hr-ft^2 heat flux from full bore release torch fire, release 45° above horizon. 50 percent mortality anticipated to those exposed.
540 feet	0.7 psig overpressure from full bore release explosion, release 45° above horizon. Minor damage to residential structures. Some injuries to those indoors due to flying debris, but very unlikely to be serious.
600 feet	0.7 psig overpressure from full bore release explosion, horizontal release. Minor damage to residential structures. Some injuries to those indoors due to flying debris, but very unlikely to be serious.

Distance to Impact (feet)	Description of Potential Consequence
600 feet	5,000 btu/hr-ft^2 heat flux from full bore release torch fire, release 45° above horizon. California Department of Education uses 1 percent mortality to those exposed.
640 feet	Distance to lower flammability limit (flash fire boundary) from full bore release at horizontal for flash fire. This would likely result in serious injury or death to those exposed to the ignited vapor cloud under typical conditions.
730 feet	3,500 btu/hr-ft^2 heat flux from full bore release torch fire, release 45° above horizon. Second degree skin burns after ten seconds of exposure.
800 feet	8,000 btu/hr-ft^2 heat flux from full bore release torch fire, horizontal release. 50 percent mortality anticipated to those exposed.
820 feet	5,000 btu/hr-ft^2 heat flux from full bore release torch fire, horizontal release. California Department of Education uses 1 percent mortality to those exposed.
820 feet	Distance to lower flammability limit (flash fire boundary) from full bore release at horizontal for flash fire. This would likely result in serious injury or death to those exposed to the ignited vapor cloud. This result is for the worst case modeling inputs, as defined by the United States Environmental Protection Agency.
940 feet	1,600 btu/hr-ft^2 heat flux from full bore release torch fire, release 45° above horizon. Second degree skin burns after thirty seconds of exposure. No fatalities anticipated for reasonable exposure duration.
980 feet	1,600 btu/hr-ft^2 heat flux from full bore release torch fire, horizontal release. Second degree skin burns after thirty seconds of exposure. No fatalities anticipated for reasonable exposure duration.
1,260 feet	0.3 psig overpressure from full bore release explosion, release 45° above horizon. 10 percent window glass breakage. No injuries.
1,370 feet	440 btu/hr-ft^2 heat flux from full bore release torch fire, horizontal release. Prolonged skin exposure causes no detrimental effect.
1,540 feet	440 btu/hr-ft^2 heat flux from full bore release torch fire, release 45° above horizon. Prolonged skin exposure causes no detrimental effect.
1,890 feet	0.2 psig overpressure from full bore release explosion, release 45° above horizon. Some window glass breakage, no injuries to building occupants.

Notes:
Psig = pounds per square inch gauge
btu/hr-ft^2 = British thermal units /hour-square foot
Source: EDM Services, Inc. 2009.

During operation, the greatest risk for injury and fatality occurs with a leak or unintentional release of natural gas. The most frequent causes of incidents include corrosion and outside forces. Outside forces include impact by mechanical equipment, such as bulldozers and backhoes; earth movements due to soil settlement, washouts, or geological hazards; weather effects, such as winds, storms, and thermal strains; and willful damage.

Regulations required for the proposed Project include a minimum 0.375-inch pipe wall thickness. PG&E would meet those requirements, and in some areas of the pipeline go beyond the required pipe thickness for the proposed Project. A large proportion of the proposed pipeline would consist of 0.375-inch-wall thickness steel pipe (Grade X-60) designed for a Maximum Allowable Operating Pressure (MAOP) of 975 pounds per square inch gauge (psig). The Project Class 2 locations would consist of 0.406- to 0.438-inch thickness steel pipe, Class 3 locations would consist of 0.500-inch-wall thickness steel pipe, and HDD sections would consist of 0.625-inch-wall thickness steel pipe, for added strength during the installation.

The DOT Code of Federal Regulations 49 Part 192.327 establishes minimum cover requirements at 30 inches for transmission pipelines in Class 1, and 36 inches in Classes 2, 3, and 4. PG&E has increased the cover beyond minimum requirements to 5 feet, which would provide increased protection from third party damage including agricultural operations.

PG&E proposes to “butt-weld” all pipeline sections (pipes are welded together without the ends overlapping). All welds (100 percent) would be x-rayed to ensure structural integrity and compliance with applicable DOT regulations. This goes beyond the DOT Code of Federal Regulations 49 Part 192.243 that requires a certain percentage of welds to be tested. Welds that do not meet American Petroleum Institute 1104 specifications would be repaired or removed. Once the welds are approved, the welded joints would be covered with a protective coating and the entire pipeline would be electronically and visually inspected for any faults, scratches, or other damage.

PG&E proposes to conduct the following inspections as a part of the proposed Project, meeting the DOT 49 CFR Part 192 requirements:

Table 4.7-7: Pipeline Inspections and Frequency

Inspection/Testing	Frequency
Cathodic protection (Pipe to Soil Potential)	Annually
Cathodic protection (Rectifier Readings)	Six times per year
Valve testing	Annually
Pipeline patrols	Annually
Class 1 & 2	Annually
Class 3	Twice per year
Leak Surveys	Annually
High Consequence Area (HCA) Risk assessment	Every seven years
Source: PG&E 2008.	

The required regulations, along with PG&E Project features that meet and exceed the minimum requirements, would reduce risks of project upset. However, additional measures are required to attempt to further reduce the proposed Project impacts.

<u>Mitigation Measures for Impact HAZ-2: Unacceptable Risk of Existing or Potential Hazards</u>

MM HAZ-2a. **Corrosion Mitigation.** The following shall be required:

- Line pipe shall be manufactured in the year 2000 or later;
- Before placing the pipeline into service, PG&E would perform post-construction geometry pig surveys, which would locate any construction related dents.
- PG&E shall prepare and implement an Operation and Maintenance Plan in accordance with the requirements in Title 49 CFR Part 192. Within the first 6 months of placing the pipeline into operation, PG&E shall conduct a baseline internal inspection with a high resolution instrument (smart pig) of the pipeline in order to obtain baseline data for the pipeline.
- Following the baseline inspection, internal inspections with a high resolution instrument (smart pig) would be conducted on a periodic basis, at a minimum of one inspection every 7 years, or sooner if the evidence suggests that significant corrosion or defects exist or if any new Federal or State regulations require more frequent or comparable inspections. The existing pipeline

system is monitored and controlled 24 hours a day for pressure drops in the pipeline that could indicate a leak or other operating problem through a Supervisory Control and Data Acquisition system, which is a computer system for gathering and analyzing real-time systems. The system is programmed to take appropriate immediate action when alarm conditions are present.

- PG&E shall prepare an Emergency Response Plan that would be coordinated and tested (through drills and exercises) with local fire/police departments and emergency management agencies.

MM HAZ-2b **Installation of Automatic Shutdown Valves.**

PG&E plans to install remote operated valves at the Capay Station and the Yolo Junction Station, which would help to control the flow of gas into Lines 406 and 407. PG&E shall install automatic shutdown valves in three locations: Power Line Road MLV Station No. 752+00 (which includes the Riego Road Regulating Station), Baseline Road/Brewer Road MLV Station No. 1107+00, and Baseline Road Pressure Regulating Station No. 1361+00. These automatic shut down valve locations would enhance public safety protection in the planned populated areas, which include schools and other existing and planned developments.

Rationale for Mitigation

Corrosion has been found to be one of the main causes of leaks or ruptures. Studies have shown that corrosion occurs more often in older pipes, therefore using pipe manufactured after 2000 would help reduce corrosion. In addition, corrosion can be slowed down by increasing the thickness of the coating on the outside of the pipe, increasing the thickness of the pipe, and by increased surveillance through cathodic protection. The corrosion mitigation measure would reduce the incidence of leaks and therefore would reduce the individual risk of serious injury or fatality. Increased wall thickness allows more time to pass before a leak may result. During that time inspections may be able to identify the potential leak and take precautionary measures. Close interval cathodic protection surveys can identify coating defects and potential metal loss before an incident occurs. Internal inspections using modern techniques can identify external corrosion and other possible causes for an incident.

Another cause of incidents has been outside forces, which accounted for 54 percent of the incidents (see Table 4.7-3 above). These included equipment operated by an outside party, equipment operated by or for the operator, earth movement, and weather. With implementation of the proposed mitigation measures, the incidence of leaks and possible explosion due to outside forces would be reduced, thereby reducing the individual risk of serious injury or fatality. Studies from western Europe have shown that increased wall thickness reduced the frequency of unintentional releases by third parties by 80 percent, increased depth of cover of 48 inches or more reduced third party-caused incidents by 30 percent, and pipelines protected by some form of warning device reduced third party-caused incidents by 10 percent (HSE 2001).

Residual Impacts

The Project design features and the proposed mitigation measures reduce the risk by 50 percent, however, the individual risk would still be approximately 1:30,000, which exceeds individual risk significance thresholds by a factor of thirty. In addition, the sensitive receptors located within certain distances described in this section along the proposed Project alignment would be significantly impacted due to risks of explosion, torch fires, and flash fires. Therefore, impacts remain significant (Class I).

Impacts of Alternatives

A No Project Alternative as well as twelve options have been proposed for the alignment in order to minimize or eliminate environmental impacts of the proposed Project and to respond to comments from nearby landowners. The twelve options, labeled A through L, have been analyzed in comparison to the portion of the proposed route that has been avoided as a result of the option. Descriptions of the options can be found in Section 3.0, Alternatives and Cumulative Projects, and are depicted in Figure 3-2A through Figure 3-2K APMs HAZ-1 through HAZ-8, as well as APM BIO-13, designed to reduce potential hazards and hazardous materials impacts from project construction and operation, would apply to all twelve options.

No Project Alternative

Under the No Project Alternative no new natural gas pipeline or above-ground stations would be constructed by PG&E in Yolo, Sutter, Sacramento, and Placer counties. Therefore, the hazards associated with the construction and operation of the Project would not occur.

Option A

Option A would realign a portion of Line 406 along CR-16 and CR-15B. This would increase the length of Line 406 which would pose an impact to existing residences and roadways. The annual likelihood of serious injury or fatality along Line 406 would increase by 22 percent, from 2.89×10^{-6} to 3.52×10^{-6}. The overall likelihood of serious injury or fatality for all of the proposed line segments would increase by 1 percent, from 6.08×10^{-5} to 6.16×10^{-5} (EDM Services, Inc. 2009). Option A would increase the risk but the impacts would be the same as for the proposed Project.

Option B

Similar to Option A, Option B would realign a portion of Line 406. This would increase the length of Line 406 which would pose an impact to existing residences and roadways. The annual likelihood of serious injury or fatality along Line 406 would increase by 29 percent, from 2.89×10^{-6} to 3.72×10^{-6}. The overall likelihood of serious injury or fatality for all of the proposed line segments would increase by 2 percent, from 6.08×10^{-5} to 6.18×10^{-5} (EDM Services, Inc. 2009). Option B would increase the risk but the impacts would be the same as for the proposed Project.

Option C

Option C would realign a portion of Line 406, but would not increase the length of Line 406, and therefore would not pose an impact to existing residences and roadways. The annual likelihood of serious injury or fatality along Line 406 would be the same for Option C as for the proposed Project. Therefore, impacts would be the same as for the proposed Project.

Option D

Option D would realign a portion of Line 406. The primary change would be to extend the portion along CR-17. This would increase the length of Line 406 which would pose an impact to existing residences and roadways. The annual likelihood of serious injury or fatality along Line 406 would increase by 30 percent, from 2.89×10^{-6} to 3.75×10^{-6}. The overall likelihood of serious injury or fatality for all of the proposed line segments would increase by 2 percent, from 6.08×10^{-5} to 6.18×10^{-5} (EDM Services, Inc. 2009). Option D would increase the risk but the impacts would be the same as for the proposed Project.

Option E

Option E would realign a portion of Line 406. The primary change would be to extend the portion along CR-19. This would increase the length of Line 406 which would pose an impact to existing residences and roadways. The annual likelihood of serious injury or fatality along Line 406 would increase by 24 percent, from 2.89×10^{-6} to 3.57×10^{-6}. The overall likelihood of serious injury or fatality for all of the proposed line segments would increase by 1 percent, from 6.08×10^{-5} to 6.16×10^{-5} (EDM Services, Inc. 2009). Option E would increase the risk but the impacts would be the same as for the proposed Project.

Option F

Option F would realign a portion of Line 407 West. The realignment would result in minimal changes to the risks posed to the public. The annual overall likelihood of serious injury or fatality along Line 407 would increase 3 percent, from 7.75×10^{-6} to 7.99×10^{-6} (EDM Services, Inc. 2000). However, the overall likelihood of serious injury or fatality for all of the proposed line segments would increase less than 1 percent from 6.08×10^{-5} to 6.12×10^{-5}. Option F would increase the risk but the impacts would be the same as for the proposed Project.

Option G

Option G would realign a portion of Line 407 West, but would not increase the length of Line 407, and therefore would not pose an impact to existing residences and roadways. The annual likelihood of serious injury or fatality along Line 407 would be the same for Option G as for the proposed Project. Therefore, impacts would be the same as for the proposed Project.

Option H

Option H would realign a portion of Line 407. Option H would extent the Project through the Sacramento Metropolitan Airport property about 0.5 mile north of the northernmost runway. Should a leak or rupture and a fire occur in this Section of the pipeline, there is potential to disrupt air traffic at the airport. Option H would result in slight changes to the risks posed to the public. The annual likelihood of serious injury or fatality along Line 407 would increase 28 percent, from 7.75×10^{-6} to 9.92×10^{-6}. The overall likelihood of serious injury or fatality for all of the proposed line segments would increase less than 4 percent, from 6.08×10^{-5} to 6.31×10^{-5}(EDM Services, Inc. 2009). Although the risk would increase under Option H, the impacts would be the same as for the proposed Project.

Option I

Option I would realign a portion of Line 407 to place the pipeline outside the 1,500-foot buffer zone around a planned high school (PG&E 2009). This alternative would:

- Add approximately 3,000 feet of pipe to the overall pipeline length.
- Remove one mile of line from potential impacts to vehicle occupants and planned commercial development along Baseline Road.
- Add 1,500 feet of potential impacts to vehicle occupants along both South Brewer and Country Acres Roads.
- Add impacts to existing rural residences.

The annual likelihood of serious injury or fatality along Line 407 would decrease 14 percent, from 1.99×10^{-5} to 1.71×10^{-5}. The overall likelihood of serious injury or fatality for all of the proposed line segments would decrease 5 percent, from 6.08×10^{-5} to 5.80×10^{-5} (EDM Services, Inc. 2009).

The California Education Code, section 17213 specifies that a school district may not approve a project involving the acquisition of a school site unless it determines that the property to be purchased or built upon does not contain a pipeline situated underground or aboveground that carries hazardous substances, acutely hazardous materials, or hazardous wastes, unless the pipeline is a natural gas line used only to supply that school or neighborhood. The California Code of Regulation, Title 5, section 14010(h) states that, "the site shall not be located near an above-ground water or fuel storage tank or within 1,500 feet of the easement of an above ground or underground pipeline that can pose a safety hazard as determined by a risk analysis study, conducted by a competent professional." This realignment would place the pipeline beyond the specified 1,500-foot school buffer.

Although the risk would decrease under Option I, the impacts would be the same as for the proposed Project.

Option J

Option J would realign a portion of Line 407 to place the pipeline outside the 1,500-foot buffer zone around a planned high school (PG&E 2009). This alternative would:

- Add approximately 5,200 feet of pipe to the overall pipeline length;

- Remove one mile of line from potential impacts to vehicle occupants and planned commercial development along Baseline Road;

- Add 2,600 feet of potential impacts to vehicle occupants along South Brewer Road; and

- Add roughly lineal feet of potential impacts to vehicle occupants along Country Acres Road.

- Add impacts to existing rural residences.

The annual likelihood of serious injury or fatality along Line 407 would decrease 10 percent, from 1.99×10^{-5} to 1.80×10^{-5}. The overall likelihood of serious injury or fatality for all of the proposed line segments would decrease 3 percent, from 6.08×10^{-5} to 5.89×10^{-5} (EDM Services, Inc. 2009). This realignment would place the pipeline line beyond the specified 1,500-foot school buffer.

Although the risk would decrease under Option J, the impacts would be the same as for the proposed Project.

Option K

This alternative would realign a portion of Line 407, Phase I approximately 150-feet further to the north, just beyond the 1,500-foot buffer of a planned elementary school. This alternative would reduce the length of line affecting vehicle occupants from the impacts of 1-inch diameter releases along Baseline Road. The annual likelihood of serious injury or fatality along Line 407, Phase I would decrease less than 2 percent, from 1.99×10^{-5} to 1.96×10^{-5}. The overall likelihood of serious injury or fatality for all of the proposed line segments would decrease less than 1 percent, from 6.08×10^{-5} to 6.05×10^{-5} (EDM Services, Inc. 2009).

Although this realignment would place the proposed natural gas line outside the 1,500-foot buffer, it is unlikely that serious risks would be posed to the student body from the applicant proposed pipeline location, which is approximately 1,350 feet from the school boundary. The distances to various impacts from the proposed pipeline are summarized below. As noted in above in Table 4.7-6 and in Appendix G-3, the impacts are very minor at distances greater than 800 to 1,000 feet.

It should be noted that the California Department of Education (CDE), Guidance Document for School Site Pipeline Risk Analysis (Guidance Document) considers 1 percent mortality (fatality probability of 1 percent) to be the reasonable estimate of the boundary of serious harm. It is considered the demarcation between threat (1 percent mortality) and no-threat (0 percent mortality). Using this criterion, the following boundary distances could be established from the proposed Line 407 to proposed school sites:

- Explosion - 420 feet. This is the distance to the 1.0 psig overpressure level from a full bore, horizontal release. This level of overpressure is considered by some sources to result in a 1 percent probability of serious injury or fatality to occupants in reinforced concrete or reinforced masonry building from flying glass and debris. It should be noted that this is a conservative result. For reference, the CDE Guidance Document indicates that an overpressure level of up to 2.3 psig will not result in any fatalities to persons inside buildings or outdoors; the maximum anticipated peak overpressure level from the proposed pipeline is 1.5 psig at distances less than 420 feet from the source.

- Flash Fire - 640 feet. This is the downwind distance to the lower flammability limit of an unignited vapor cloud from a full bore horizontal release under the typical conditions outlined in Table 4.7-6 It should be noted that the size of the combustible vapor cloud can vary significantly depending on atmospheric and other conditions. For example, if the wind speed was decreased from 2.0 to 1.5 meters per second and the stability class was changed from D to F, the downwind distance to the lower flammability limit of the unignited vapor cloud would increase to 820 feet; these conditions are considered the worst case for off-site consequence modeling from stationary sources by the United States Environmental Protection Agency.

- Torch Fire - 820 feet. This is the distance to the 5,000 btu/hr-ft^2 heat flux which is considered by the CDE to be the level of exposure resulting in 1 percent mortality. For reference, the CDE Guidance Document provides charts for determining radiant heat from torch fires. Although these charts were developed using a different modeling software, they show a distance of 975 feet from the release to the 5,000 btu/hr-ft^2 heat flux. (CDE 2007)

Although the risk would decrease under Option K, the impacts would be the same as for the proposed Project.

Option L

Option L would involve installing the portion of Line 407, which is within the 1,500 foot buffer of a planned elementary school, using horizontal directional drilling techniques. This would significantly reduce or eliminate the likelihood of the line being damaged by third parties, since the line would be installed well below normal excavation depths. The estimated baseline risk of unintentional release would be reduced roughly one-third, from $1.96x\ 10^{-4}$ to $1.2x10^{-4}$. The annual likelihood of serious injury or fatality along Line 407 would decrease less than 3 percent, from $1.99x10^{-5}$ to $1.94x10^{-5}$. The overall likelihood of serious injury or fatality for all of the proposed line segments would decrease less than 1 percent, from $6.08x10^{-5}$ to $6.03x10^{-5}$ (EDM Services, Inc. 2009). However, although the risk would decrease under Option I, the impacts would be the same as for the proposed Project.

Table 4.7-8: Comparison of Alternatives for Hazards and Hazardous Materials

Alternative	Comparison with Proposed Project
No Project	No Impacts
Option A	Similar Impacts
Option B	Similar Impacts
Option C	Similar Impacts
Option D	Similar Impacts
Option E	Similar Impacts
Option F	Similar Impacts
Option G	Similar Impacts
Option H	Similar Impacts
Option I	Similar Impacts
Option J	Similar Impacts
Option K	Similar Impacts
Option L	Similar Impacts
Source: Michael Brandman Associates 2009.	

4.7.6 Cumulative Projects Impact Analysis

The exact timing of construction for most of projects in proximity to the proposed Project is unknown but could possibly coincide with the proposed Project. Coinciding construction schedules could increase the risk of certain hazards, including environmental contamination, exposure to hazardous materials, and wildland fires. However, these risks would be temporary in nature, as construction of the proposed Project is estimated to last three to four months. Cumulative impacts related to risk of environmental contamination, exposure to hazardous materials, and wildland fires would be less than significant (Class III).

4.7.7 Summary of Impacts and Mitigation Measures

The potential to interfere with emergency plans and the potential for wildland fires during construction activities would be reduced to a less than significant level through the implementation of Mitigation Measure HAZ-1.

Between 1970 and 1984 there were 5,862 reportable gas pipeline incidents resulting in 438 injuries and 74 deaths. From 1984 to 2004 there were 2,845 incidents causing 1,523 injuries and 340 deaths. The major causes of the incidents were corrosion and third party incidents. These two causes were responsible for 71 percent of the incidents between 1970 and 1984 and 63 percent of the incidents between 1986 to 2001.

The potential individual risk of serious injury or fatality attributed to the proposed Project has been estimated to be one in 16,000 (1:16,000) annually, roughly 60 times greater than the generally acceptable level of one in one million (1:1,000,000) per year. Mitigation measures HAZ-2a and HAZ-2b reduce the potential for leaks due to corrosion and serve to enhance public safety, but they do not reduce the risk of upset impact to a less than significant level. The impact is therefore considered significant and unavoidable (Class I). Table 4.7-9 summarizes the impacts and mitigation measures for hazards and hazardous materials.

Table 4.7-9: Summary of Hazards and Hazardous Materials and Mitigation Measures

Impact	Mitigation Measure
HAZ-1. Emergency plans/Wildland fires.	**HAZ-1.** Minimize risk of fire.
HAZ-2. System Safety and Risk of Serious Injuries and Fatalities Due to Project Upset.	**HAZ-2a.** Corrosion mitigation. **HAZ-2b.** Installation of automatic shut-down valves.
Source: Michael Brandman Associates 2009.	

4.8 HYDROLOGY AND WATER QUALITY

This Section describes the existing hydrology and water quality and evaluates potential effects on these resources that may result from Project implementation. This evaluation is a summary of a compendium of knowledge regarding hydrology and water quality issues statewide, as well as those issues applicable to regions in which the Project would be implemented.

4.8.1 Environmental Setting

The Project is located in the northern portion of California's Central Valley, within the Lower Cache, Sacramento-Stone Corral, Lower Sacramento, and Lower American watersheds (USGS Hydrologic Units 18020110, 18020104, 18020109, and 18020111, respectively) in Yolo, Sutter, Sacramento, and Placer counties. The Central Valley is bounded on the west by the Coast Range and on the east by the Cascade and Sierra Nevada ranges. The Sacramento River is the main drainage for the northern part of the Central Valley, and receives water from two major river systems near the Project area (the Feather River and the American River) and a number of creeks that flow from the mountain ranges surrounding the valley.

Groundwater supply in the Central Valley comes from the Central Valley aquifer system, an unconsolidated sand and gravel freshwater aquifer located in the continental deposits that overlie about 20,000 feet of marine sediments (which generally contain saline water). The Project area is in the Sacramento Valley subregion of the aquifer, named for its associated surface-water drainage, the Sacramento River. Studies indicate the Central Valley aquifer system is a single system that contains unconfined conditions in the upper few hundred feet, which grades into confined conditions with depth.

The Project area ranges in elevation from approximately 15 to 255 feet, and consists of flat to rolling hill topography. The climate in the Project area is moderate, with average temperatures ranging seasonally from approximately 33 to 97 degrees Fahrenheit (°F), and an average precipitation of approximately 23 inches. Approximately 85 percent of the precipitation falls from November to April. Because the valley receives relatively little precipitation, most of the precipitation that falls on the valley floor evaporates before it can become aquifer recharge. Precipitation in the mountains to the east of the valley can exceed 80 inches annually, and thus the Central Valley aquifer system relies heavily on annual runoff from rainfall and snowmelt from the Cascade and northern Sierra Nevada mountain ranges (most of the runoff from the Coast Range travels west to the Pacific Ocean). Nearly all of the average annual recharge the valley aquifer system receives (approximately 12 inches) is from the runoff flowing into perennial streams and rivers in the valley. Recharge occurs primarily from surface water seeping downward within these streams and rivers.

The natural hydrology of much of the Project area has been significantly modified for agricultural use. In the western portion of the Project where Line 406 would be constructed, small intermittent creeks and irrigation canals and ditches make up a majority of the water features. Moving east, Line 407 West crosses numerous irrigation canals and ditches, the Yolo Bypass, and the Sacramento River. In the easternmost Project area, Line 407 East crosses two smaller intermittent creeks, Curry Creek, and the Natomas East Main Drainage Canal (Steelhead Creek), in addition to numerous irrigation canals and ditches that supply water for rice production and other grain crops within the Natomas Basin.

From a water quality perspective, the Sacramento River from Knights Landing to the Sacramento-San Joaquin Delta is identified in the 2006 California section 303(d) List and total maximum daily load (TMDL) Priority Schedule as an impaired water body for the following contaminants: mercury and unknown toxicity (RWQCB 2006). The northern portion of the Sacramento-San Joaquin Delta downstream of the Project area has been designated as impaired for a variety of contaminants, including pesticides (chlorpyrifos, dichloro-diphenyl-trichloro-ethane [DDT], diazinon, and Group A pesticides) resulting from agricultural and urban runoff/storm sewers, mercury (from abandoned mine drainage), polychlorinated biphenyls (PCBs), exotic species, and unknown toxicity (unknown cause) (RWQCB 2006). Table 4.8-1 contains the section 303(d) listed water bodies within the Project area.

Table 4.8-1: 303(d) Waters within the Project Area

303(d)-Listed Water	Pollutant	Potential Sources	Miles Affected
Steelhead Creek (Upstream of Arcade Creek)	Polychlorinated biphenyls	Industrial point sources, agriculture, urban runoff/storm sewers	12
Sacramento River (Knights Landing to Delta)	Diazinon, mercury, unknown toxicity	Agriculture, resources extraction, source unknown	16
Source: Central Valley Regional Quality Control Board, 2002.			

Line 406

Line 406 is situated just north of the Cache Creek Watershed in Yolo County, downstream of the Capay Diversion Dam. The general flow of water in this area is west to east, following the flow of Cache Creek. During normal and high flows in late fall and winter (associated from storm runoff from seasonal storms), Cache Creek flows into the Yolo Bypass near the southeast corner of the Cache Creek Settling Basin, just north of Interstate (I) 5. In summer months, the creek upstream of the Cache Creek Settling Basin dries up. Water sources in the Line 406 Project area include the Cache Creek system and groundwater.

Two canals, including Hungry Hollow Canal and Goodnow Slough, would be crossed by this portion of the Project. Cache Creek is situated south of Line 406 and would not be crossed by the Project. According to the Yolo County Flood Control and Water Conservation District, data collected in 1996 show spring groundwater levels in this area to be more than 20 feet below ground elevation. More current groundwater data do not appear to be available.

Line 407 West

Line 407 West runs from just north of the City of Woodland in the Cache Creek watershed east into the Sacramento River watershed, across the Knights Landing Ridge Cut, the Yolo Bypass, and the Sacramento River. The Yolo Bypass is flooded during wet months (fall and winter) by overflow from the Sacramento River. Canals and sloughs in the area fill during these months and eventually drain to leave marsh-like conditions in the summer and fall. Water sources in the area include the Cache Creek system, the Sacramento River, and groundwater.

Several irrigation canals in the Line 407 West segment may be crossed using open-cut methods, but major water features in this area, including two crossings of the Knights Landing Ridge Cut, the Tule Canal (eastern Yolo Bypass), and the Sacramento River, would be horizontal directional drilled (HDD). According to data gathered in spring 1996, groundwater levels in this area rise from around 20 to 30 feet below ground surface near Woodland to approximately 0 to 15 feet below ground surface near the Sacramento River. More current groundwater data do not appear to be available.

Line 407 East

Line 407 East runs through the Natomas Basin from just east of the Sacramento River to just west of the City of Roseville. Line 407 East would cross several irrigation canals, seasonal wetlands, vernal pools, Curry Creek, and Steelhead Creek. The general direction of surface water flow in the Line 407 East segment is east to west, toward the Sacramento River. Groundwater data gathered between 2000 and 2005 shows groundwater levels at approximately 0 to 15 feet below ground surface in the Natomas Basin area. The depth to groundwater increases gradually to the east of the Natomas Basin, to approximately 140 feet below ground surface near the City of Roseville.

Powerline Road Distribution Feeder Main

The Powerline Road Distribution Feeder Main (DFM) is just east of the Sacramento River. There is a high water table in this area, and the line crosses several irrigation canals. Groundwater has been recorded between 0 and 10 feet below ground surface in this area.

4.8.2 Regulatory Setting

Federal

Federal Water Pollution Control Act, or Clean Water Act (CWA)

<u>Compliance with Section 404 of the CWA</u>

Subject to section 404 of the CWA, the United States Army Corps of Engineers (USACE) would assert jurisdiction over all waters and their tributaries which either flow interstate, are navigable or are otherwise used in commerce, as outlined in Title 33 of the Code of Federal Regulations (CFR), section 328.3(a). Impacts to any such 'waters of the United States,' such as the placement of fill within such water, requires that a Section 404 Permit for the discharge of fill be applied for and received from the USACE in advance of such fill.

<u>Compliance with Section 401 of the CWA</u>

In connection with notification to the USACE under section 404 of the (CWA), a written request for CWA Section 401 Water Quality Certification (WQC) must be submitted to the Central Valley RWQCB to ensure that no degradation of water quality would result from the proposed Project associated with impacts to USACE jurisdictional drainages. Subject to CWA section 401(a)(1), the USACE cannot issue a Section 404 Dredge/Fill Permit until such time as a CWA section 401 WQC has been approved by the applicable RWQCB. Section 401 is set forth in general condition (GC 21) of the USACE Nationwide Permitting Program.

In order to meet the requirements of the RWQCB for issuance of section 401 WQC, the project proponent must provide assurances that the project would not adversely affect the water quality of receiving water bodies. A written request for section 401 WQC would be prepared and submitted to the Central Valley RWQCB for review. The request would include a detailed project description, a description of *potential* impacts from the proposed project, identification and discussion of beneficial uses of affected receiving waters (beneficial uses are described within the appropriate Water Pollution Control Plan (or “basin plan”) for the RWQCB), a water quality plan identifying project-specific Best Management Practices (BMPs), discussion of other approvals and certifications being obtained, a conceptual restoration plan, and a completed notification form.

<u>National Pollutant Discharge Elimination System (NPDES) Permits</u>

Section 402 of the CWA regulates construction-related stormwater discharges to surface waters through the National Pollutant Discharge Elimination System (NPDES) program, administered by the U.S. Environmental Protection Agency (EPA). In California, the State Water Resources Control Board (SWRCB) is authorized by EPA to oversee the NPDES program through the RWQCBs. The proposed Project is under the jurisdiction of the Central Valley RWQCB. The NPDES program provides both General Permits, which include those that cover a number of similar or related activities, and Individual Permits. Most construction projects that disturb more than one acre of land are required to obtain coverage under the NPDES General Permit for Construction Activities, which requires the Applicant to file a public notice of intent to discharge stormwater and to prepare and implement a Stormwater Pollution Prevention Plan that includes BMPs to be implemented during all phases of development (as discussed in further detail below under SWRCB Board General Construction Permit).

State

California Fish and Game Code Section 1602

In the public interest of protection and conservation of fish and wildlife resources of the state, Fish and Game Code section 1602 requires any person, state or local governmental agency, or public utility to notify the California Department of Fish and

Game (CDFG) before beginning any activity that will do one or more of the following: (1) substantially obstruct or divert the natural flow of a river, stream, or lake; (2) substantially change or use any material from the bed, channel, or bank of a river, stream, or lake; or (3) deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into a river, stream, or lake. CDFG's jurisdiction includes ephemeral, intermittent, and perennial watercourses, including dry washes, characterized by:

- The presence of hydrophytic vegetation;
- The location of definable bed and banks; and
- The presence of existing fish or wildlife resources.

Before any impacts are made to such features, a Fish and Game Code section 1602 Streambed Alteration Agreement (SAA) must be applied for and obtained from the CDFG.

Furthermore, CDFG jurisdiction includes the "bed, bank, or channel," which can be interpreted to include habitats adjacent to watercourses, such as oak woodlands in canyon bottoms or willow woodlands that function as part of the riparian system. Historic court cases have further extended CDFG jurisdiction to include watercourses that seemingly disappear, but re-emerge elsewhere. However, the CDFG does not regulate isolated wetlands under Fish and Game Code section 1600 et seq.; that is, those that are not associated with a river, stream, or lake.

<u>CDFG Regulated Activities</u>

The CDFG regulates activities that involve diversions, obstruction, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake that supports fish or wildlife resources. When a project requires such activities, a Section 1602 Streambed Alteration Notification would be prepared and submitted to the CDFG for review. The request would include a detailed project description, a description of proposed impacts, a conceptual mitigation plan, and completed notification forms. Typically, the CDFG would be able to complete the agreement within 60-90 days of the completion of the CEQA process.

State Water Resources Control Board General Construction Permit

The SWRCB implements aspects of the Federal CWA, including section 402 of the Act as discussed above. In California, any projects that disturb one acre or more of soil, or any projects that disturb less than one acre but are part of a larger common plan of development that disturbs one acre or more, is required to be covered by the General Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit, 99-08-DWQ). A Notice of Intent (NOI) package must be submitted to the SWRCB and a site specific Storm Water Pollution Prevention Plan (SWPPP) must be prepared to address construction phase related stormwater discharge issues.

The SWPPP would include a site map, or maps, showing the construction site perimeter, existing and proposed buildings, lots, roadways, storm water collection, and discharge points, general topography before and after construction, and drainage patterns across the Project site. The SWPPP would also identify erosion controls, runon, and runoff controls, sediment controls, sediment tracking, and 'good housekeeping' practices related to controlling stormwater runoff. It would also contain sections on materials handling, development of stormwater performance standards, training, and required qualifications of maintenance staff. The implementation of the SWPPP during construction-phase activities would ensure that the Project does not violate state water quality standards. The SWPPP would also depict graphically and in list form the BMPs that would be utilized to control and prevent storm water runoff from the construction site. The SWPPP would also contain a visual monitoring plan.

BMPs that may be identified in the SWPPP include the following: placement of silt fences and sand and gravel bags; stabilization of entry and exit points; construction of berms; installation of geofabric; revegetation of areas by hydroseeding and mulching; actions for control of potential fuel or drill tailing release; use of trench stabilizing and de-watering and requirements for disposal (i.e., location, quality); designation of solid waste container sites; and the identification of storage areas for chemicals, paint, solvents and other construction materials. Once prepared, a copy of the SWPPP would be kept available at the construction site headquarters for review and approval by visiting members of the SWRCB or the Central Valley RWQCB. Copies of the SWPPP would also be made available to residing City and County jurisdictions if requested, and shall be available for review, if requested and applicable, by City and County Engineering Departments.

Porter-Cologne Water Quality Act

Section 13260(a) of the California Water Code ("Water Code," or "Porter Cologne") requires that any person discharging waste or proposing to discharge waste within any region, other than to a community sewer system, which could affect the quality of the waters of the State, file a report of waste discharge (ROWD). The discharge of dredged or fill material may constitute a discharge of waste that could affect the quality of waters of the State (Defined in Water Code section13050(e)).

Typically, the State of California relies upon its authority under section 401 of the Federal CWA (33 U.S.C. section 1341) to regulate discharges of dredged or fill material to California waters that are also within the jurisdiction of the USACE. Given the WQC process employed under section 401, waste discharge requirements under Porter Cologne are typically waived for those projects requiring a water quality certification. In 2001 the U.S. Supreme Court decision in *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers*, 531 U.S. 159 (2001) (SWANCC) invalidated the Army Corp's use of the "Migratory Bird Rule" to establish Federal jurisdiction over isolated waters. Since 2001, the State of California has reasserted its authority under State law to assert jurisdiction over isolated waters for water quality purposes by requiring a ROWD.

Local

Water Quality Control Plan

The Central Valley RWQCB (Region 5) protects the beneficial uses of water resources within the Central Valley, including Yolo, Sutter, Sacramento, and Placer counties. In 1998, the Central Valley RWQCB adopted The Water Quality Control Plan for the Sacramento River Basin and San Joaquin River Basin (Basin Plan), Fourth Edition. A revised version of the Basin Plan was released in August 2006. The plan sets forth implementation policies, goals, and water management practices in accordance with the Porter-Cologne Water Quality Control Act and the Federal CWA, and establishes standards and objectives for water quality specific to the Central Valley region aimed at protecting aquatic resources. Based on the Project being located within the jurisdiction of the Central Valley RWQCB, all discharges to surface water or groundwater from Project activities are subject to the requirements of the Basin Plan.

4.8.3 Significance Criteria

General

An adverse impact on water quality is considered significant and would require mitigation if Project construction or operation would:

1. Result in violation of Federal or State Agency quantitative or qualitative water quality criteria, standards, or objectives (including objectives promulgated by the CVRWQCB and criteria set forth in the Proposed California Toxics Rule); or

2. Otherwise degrade or impair beneficial uses designated by the CVRWQCB.

Groundwater

An adverse impact on groundwater resources is considered significant and would require mitigation if Project construction or operation would:

1. Alter the flow of groundwater to local springs or wetland areas;

2. Interrupt or degrade groundwater used for private or municipal purposes; or

3. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level.

Surface Water

An adverse impact on surface water resources is considered significant and would require mitigation if Project construction or operation would:

1. Result in increased sedimentation or erosion that adversely affects the operation of irrigation water control structures, gates, or valves or the quality of municipal water supply reservoirs;

2. Result in increased sedimentation or erosion such that degradation of channel stability or water quality results;

3. Substantially alter the existing drainage pattern of the site or area, including through the alteration of a course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in on-site or off-site flooding;

4. Place permanent structures within the 100-year floodplain that would be damaged by flooding; or

5. Degrade the integrity of structures, such as bridges, pipelines, and utilities due to erosion and improper conveyance of stormwater during construction and operation.

4.8.4 Applicant Proposed Measures

Applicant Proposed Measures (APMs) have been identified by PG&E in its Environmental Analysis prepared for the CSLC. APMs that are relevant to this Section are presented below. This impact analysis assumes that all APMs would be implemented as defined below. Additional mitigation measures are recommended in this Section if it is determined that APMs do not fully mitigate the impacts for which they are presented.

APM HWQ-1. PG&E will implement BMPs from the Water Quality Construction Best Management Practices Manual to prevent project-related erosion and sedimentation. A monitoring program will be established to ensure that the prescribed BMPs are followed throughout pipeline construction. Examples of these BMPs include:

- Preparation, training, and maintenance for clear work site practices, tracking controls, and materials management to minimize the direct work impacts on soil and erosion;
- Installation of temporary silt fences and other containment features, including gravel bags and fiber rolls, surrounding work areas to prevent the loss of soil during rain events and other disturbances;
- Utilization of storm drain inlet protection, including sediment filters and ponding barriers, in order to retain sediments on-site and prevent excess discharge into storm drains; and
- Implementation of soil erosion controls, including preservation of existing vegetation, temporary soil stabilization through hydro seeding, mulching, and other techniques.

APM HWQ-2. PG&E will implement a Hazardous Substances Control and Emergency Response Plan for preventing, controlling, and cleaning up hazardous material spills.

APM HWQ-3. PG&E will perform open-cut crossings of waterbodies using a dry-crossing method (coffer dams with temporary water diversion).

APM HWQ-4. PG&E will cross larger and/or more sensitive waterways with HDD or bores.

APM HWQ-5. PG&E will prepare an HDD Fluid Release Contingency Plan that will specify procedures to contain and clean up any drilling mud released into waterways in the event of a frac-out.

4.8.5 Impact Analysis and Mitigation

Impact Discussion

Because the Project would be constructed underground and the disturbed surfaces restored (aside from the regulating and metering stations), there would be no long-term impacts to hydrology and water quality. Potential adverse impacts to water quality would be short-term and temporary. Impacts to water quality during construction of the Project would be minimized by the implementation of best management practices (BMPs) proposed in APM HWQ-1 and APM BIO-7. The analysis presented in this Section focuses on the potential impacts from construction of the Project.

CVRWQCB Beneficial Uses

The Project would not otherwise degrade or impair beneficial uses designated by the CVRWQCB. As stated below for Impact HWQ-1, implementation of APM BIO-35 would ensure that PG&E acquire all necessary permits from the CVRWQCB, and that all additional avoidance or mitigation measures that are agreed upon during the permitting process with regard to water quality are implemented. Discharge and dewatering activities would be strictly regulated by Project permit conditions. A specific discharge permit would be obtained, and the requirements would be adhered to, and therefore, beneficial uses would not be impacted (less than significant, Class III).

Groundwater Flow

Groundwater recharge in the Central Valley aquifer system occurs mainly within perennial streams and rivers fed by mountain runoff. The Project would not alter the flow of groundwater to local springs or wetland areas. Any potential impacts on groundwater flow from this Project would occur as a result of changes in groundwater recharge due to stream flow changes in streams and rivers where recharge occurs. Dry open-cut trenching or HDD methodologies would be used in the crossing of water features that influence groundwater recharge to local springs or wetland areas. Open cuts would be excavated on county roads and small irrigation canals and dams. These trench excavations would be opened, filled with a pipeline, and closed the same day or covered by a plate during non-construction hours. Waterbodies with low flows would be crossed using a dry-crossing method, such as coffer-dams with temporary water diversions. HDD would be used to install approximately 15,568 linear feet of pipe beneath the Sacramento River, Yolo Bypass (including Tule Creek), Knights Landing Ridge Cut, I-5, I-505, and other sensitive areas. HDD is carried out by utilizing a powerful horizontal drilling rig supported by a drilling mud tank and a power unit. HDD would allow for non-intrusive preparation and installation of the proposed pipeline beneath features containing or contributing to water resources in the area, and would not result in an alteration of the flow of groundwater to local springs or wetland areas.

As proposed in APM HWQ-3 and APM HWQ-4, and in APM BIO-20 and APM BIO-21, the Project incorporates design features and construction techniques that reduce potential impacts to groundwater flow to less than significant. As discussed in Section 4.4, Biological Resources, implementation of APM BIO-5, APM BIO-7, APM BIO-13, APM BIO-16, and APM BIO-23 would further reduce potential impacts to groundwater flow to less than significant (Class III).

Groundwater Supply

The Project would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level. All Project trenching or directional drilling would take place in accordance with APM HWQ-3, APM HWQ-4, as well as APM BIO-20, and APM BIO-21 (further described in Section 4.4, Biological Resources), and would not result in the development of any additional impermeable surfaces and would not significantly alter the existing topography or its drainage characteristics. Therefore, the overall infiltration characteristics would remain essentially unchanged during and after Project completion, and the quantity of groundwater for extraction and supply would remain the same.

As part of construction, the Project would require 7.26 million gallons of water for hydrostatic testing of the pipeline. The discharge of this water would occur in the groundwater recharge area for the Central Valley aquifer system that occurs mainly within perennial streams and rivers. The hydrostatic testing would result in one time discharges for each of the four segments as they are completed.

Water utilized during hydrostatic testing would be disposed of via the following methods, as described in PG&E's Pre-Construction Review report (PG&E 2007b):

- Discharged into sanitary sewer systems; or
- Discharged into storm drains, drainage ditches, creeks, or rivers (carbon filtering or other form of water conditioning may be required).

The method to be utilized would be determined by the availability and capacity of the systems in the area, requirements of governing agencies, and condition of water after hydrostatic testing. Water quality would be measured from the water source prior to use and after use during discharge to assure that water quality is not compromised as a result of the test. All hydrostatic testing water would be discharged using a flow manifold and energy dissipater to control the rate of discharge and to minimize erosion and turbidity to meet the standards set forth under the terms and conditions of the NPDES permit and the General Order for Dewatering and Other Low Threat Discharges to Surface Waters, to be issued by the CVRWQCB.

Based on past experience with similar projects, PG&E anticipates that no contaminants would be introduced to the surface water during the testing process and that all samples would meet standards for gray water and that the water discharged from the hydrostatic test would pose no threat to any plants, fish, or animals. Therefore, impacts to groundwater supplies by the hydrostatic testing would be temporary and less than significant (Class III).

Sedimentation or Erosion - Reservoirs

The Project would not result in increased sedimentation or erosion that adversely affects the operation of irrigation water control structures, gates, or valves or the quality of municipal water supply reservoirs. There are no municipal water supply reservoirs within the vicinity, or downstream of the Line 406 and Line 407 pipelines. As proposed in APM HWQ-1, APM HWQ-2, and APM BIO-7, the Project would employ BMPs that would minimize erosion and subsequent sedimentation, and therefore maintain water quality. Therefore, potential impacts to irrigation water control structures, gates, or valves and municipal water supply reservoirs would be less than significant (Class III).

Sedimentation or Erosion - Channels

Increased erosion and sedimentation would have the potential to occur if Project activities result in soil disturbance and runoff carrying erosion from those areas into streams. In APM HWQ-4, APM BIO-20, and APM BIO-21, the Project proposes that the crossing of major waterways and floodplain areas along the proposed alignment would be conducted using HDD methodologies. Entrance and exit locations would be set back from streams and channels. As proposed in APM HWQ-5, APM BIO-23, and MM HWQ-1, the Project would implement a HDD Fluid Release Contingency Plan that would require that any drilling fluids inadvertently released into waterways or wetlands during HDD procedures would be cleaned up.

Open-cut trenching is proposed during the dry months within county roads and small irrigation canals along the proposed alignment. These activities would have the potential to increase erosion and sedimentation if they are not re-contoured and restored before the wet season. Because open-cut trenching would be temporary and would be restricted to the summer dry months, no sedimentation or erosion into active waterways are anticipated. Open trenches would be backfilled, re-contoured, and compacted immediately following excavation and installation of pipeline sections. Restoration of affected areas would occur during the same dry season, thereby preventing the exposure of unsettled substrate to streamflow within the affected areas during the wet season.

As discussed in Impact HWQ-1, implementation of APM BIO-5 would ensure that PG&E acquires all necessary permits from the USACE, the CVRWQCB, and the CDFG for potential stream channel impacts. There may be some additional avoidance or mitigation measures that are required by the CVRWQCB or the CDFG during the permitting process with regard to water quality criteria, standards, or objectives that would be implemented.

Implementation of APM HWQ-1 and APM BIO-7 would ensure that the Project adheres to BMPs during the construction phase to avoid or minimize potential adverse impacts to water quality. Implementation of the PG&E Water Quality Construction Best Management Practices Manual and the Erosion Control and Sediment Transport Plan would ensure the avoidance or minimization of potential impacts to water quality from erosion and sedimentation. Therefore, impacts would be less than significant (Class III).

Drainage Pattern

The Project would not substantially alter the existing drainage pattern of the site or area, including through the alteration of a course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in on-site or off-site flooding. As proposed in APM HWQ-3, APM HWQ-4, APM BIO-20, and APM BIO-21, Project impacts to drainage patterns would be avoided along the majority of the proposed alignment through the implementation of HDD methods. Any potential impacts to surface water drainage patterns resulting from dry season open-cut trenching would be minor and temporary in nature. Temporary stream channel impacts associated with open-cut trenching would be restricted to irrigation canals and smaller ephemeral waterways, and would not increase the rate or amount of surface runoff or result in on-site or off-site flooding. The Project would not result in any additional impermeable surfaces and would not significantly alter the existing topography or its drainage characteristics.

As proposed in APM BIO-16, APM BIO-17, APM BIO-18, APM BIO-19, and APM BIO-22, temporary impact areas resulting from open-cut trenching would be restored and re-contoured to pre-Project conditions such that biological and hydrology functions and values of affected areas, and areas downstream of affected areas, are retained. Existing channel material would be replaced during the backfilling of all trenches such that channel infiltration characteristics would remain essentially unchanged during and after Project completion.

The implementation of APM BIO-5 would ensure that PG&E acquires all necessary permits from the regulatory agencies for any impacts to waters and wetlands that occur along the proposed alignment. Project permitting would ensure that all temporary disturbances to drainage patterns that are jurisdictional under section 1600 are mitigated. This would include permitting with the CDFG and acquisition of a Streambed Alteration Agreement for the Project. Additional avoidance or mitigation measures that are required by CDFG during the permitting process with regard to alteration of drainage patterns would be implemented and adhered to and impacts would be less than significant (Class III).

Structure Integrity

The Project would not degrade the integrity of structures, such as bridges, pipelines, and utilities due to erosion and improper conveyance of stormwater during construction and operation. The proposed alignment runs along various roads and associated rights-of-way (ROW) that contain existing structures. As proposed, HDD methods would be employed in the crossing of larger waterways and major roads, including I-5, I-505, State Route (SR) 113, Powerline Road, and SR-99/70. All structures associated with these areas would be avoided.

During excavation activities for open-cut trenching and pipe installation, it is anticipated that construction would occur in the immediate vicinity of existing structures. As proposed in APM HWQ-1, MM HWQ-1, and APM BIO-7, PG&E would implement measures contained within the Water Quality Construction Best Management Practices Manual, in addition to an Erosion Control and Sediment Transport Plan and Storm Water Pollution Prevention Plan for the Project, and any subsequent permit obligations pertaining to water quality. Discharge and dewatering activities would be strictly regulated by Project permit conditions. Collectively, these measures would ensure that all water quality plans are implemented and BMPs are employed to prevent erosion and improper conveyance of stormwater during construction and operation. Impacts would be less than significant (Class III).

Impact HWQ-1: Federal or State Water Quality Standards

The Project could result in violation of Federal or State Agency quantitative or qualitative water quality criteria, standards, or objectives (including objectives promulgated by the CVRWQCB and criteria set forth in the Proposed California Toxics Rule) (Potentially Significant, Class II).

Inadvertent erosion that results in increased sediment in streams or discharge of other materials into waterbodies as a result of Project construction activities could result in adverse impacts to water quality. As proposed in APM HWQ-1 and APM BIO-7, PG&E would implement BMPs during the construction phase to avoid and minimize potential adverse impacts to water quality. Implementation of the PG&E Water Quality Construction Best Management Practices Manual and the Erosion Control and Sediment Transport Plan would ensure the avoidance and minimization of potential impacts to water quality. As proposed in APM BIO-5, PG&E would acquire all necessary permits from the USACE, the CVRWQCB, and the CDFG, and would implement additional avoidance or mitigation measures that are required by the CVRWQCB, the CDFG and/or the USFWS during the permitting process related to protection of water quality. Discharge associated with dewatering activities would be strictly regulated by Project permit conditions. Permits include the General Construction Permit (99-08-DWQ) which is required for discharges of storm water associated with construction activity and includes a site specific SWPPP and a list of BMPs to be implemented. Prior to construction, a discharge permit (Order No. 5-00-175) would be required of and adhered to by PG&E. The permit would require that the flow rates be limited to 0.25 million gallons per day during dry months. Limiting the flow rates during dry months would minimize impacts to downstream channel characteristics.

Improper use and storage of hazardous materials and pollutants associated with Project construction could potentially result in adverse impacts to water quality. As proposed in APM HWQ-1 and APM BIO-13, hazardous materials and pollutants near waterbodies that could result in a threat to life or damage to property would be stored and handled in accordance with the Project's Hazardous Substances Control and Emergency Response Plan. Implementation of this plan, in addition to implementation of Project construction BMPs, would ensure that potential impacts to water quality are either avoided or minimized.

A frac-out is possible during HDD, which could degrade water quality as a result of drilling muds being discharged into a stream or river. As proposed in APM HWQ-5 and APM BIO-23, PG&E would develop an HDD Fluid Release Contingency Plan that would require mitigation in the unlikely event of a frac-out resulting in discharge of drilling mud that would potentially result in adverse impacts to water quality. The plan would include measures to contain and clean up any drilling mud inadvertently released into waterways. However, since there are insufficient details in APM HWQ-5 to ensure that potential impacts would be minimized, MM HWQ-1 is required to be implemented prior to any construction activities.

Potential impacts to quantitative or qualitative water quality criteria, standards, or objectives, including objectives promulgated by the CVRWQCB and criteria set forth in the Proposed California Toxics Rule, would be short-term, and temporary. The potential impacts would be reduced to less than significant through the implementation of the APMs discussed above and through MM HWQ-1 below.

Mitigation Measures for Impact HWQ-1: Federal or State Water Quality Standards

MM HWQ-1. **Response to Unanticipated Release of Drilling Fluids.** Sixty days prior to the commencement of HDD activities near water crossings, PG&E shall prepare and submit for CSLC, RWQCB, and CDFG approval, an HDD frac-out prevention and response plan that contains the following provisions:

- HDD crews shall strictly monitor drilling fluid pressures;
- Obtain site-specific geotechnical data at all water crossings where HDD is to be used to determine the appropriate depth below bed of waterway;
- Implement sizing techniques (move bores back and forth slowly to keep track of potential frac-outs);
- Consider potential application of surface casings to add a protective outer layer;
- Conduct Geotech bores in locations that would prevent drilling mud from escaping through boreholes;
- Prohibit nighttime drilling near sensitive noise receptors unless absolutely required;
- Maintain containment equipment for drilling fluids on site;
- Monitor turbidity downstream of the drill site;
- Cease work immediately if a seep into a stream is detected, such as by a loss in pressure or visual observation of changes in turbidity or surface sheen;
- Immediately report all bentonite seeps into waters of the State or sensitive habitat to the Project's resource coordinator, the CSLC, and the appropriate resource agencies (i.e., NOAA, USFWS, CDFG, USACE, applicable RWQCBs, local County, and DWR);
- Use non-toxic fluorescent dye in the drilling mud to allow easier identification of frac-outs;
- Maintain onsite boats with monitors where appropriate;
- In the event of a release during construction, PG&E shall assess the extent of potential damage to fisheries and carry out

appropriate mitigation/compensation procedures. Impacts to consider include curtailment of access to fishing areas, contamination of fish and habitat, and loss of income to commercial fishing interests and businesses. Procedures for assessing damage should include field surveys to determine the extent of damage during and soon after the release and long-term monitoring to determine long-term effects to habitat, fish, and fishing interests; and

- A 3,000-gallon vacuum truck shall be available on call in case a spill or frac-out occurs.

Rationale for Mitigation

The procedures outlined in the HDD frac-out prevention and response plan would ensure that any drilling fluids released into or near waterways are immediately cleaned up in the event of a frac-out. With this measure, potential impacts would be reduced to less than significant.

Impact HWQ-2: Groundwater for Private or Municipal Purposes

The Project could interrupt or degrade groundwater used for private or municipal purposes (Potentially Significant, Class II).

There are rural residences, agricultural properties and undeveloped properties located within the Project area. Private water wells, irrigation wells, and water pipelines may be located within and extend into the Project construction areas or construction staging areas. Mitigation is proposed below to determine well locations and to test each well located within 200 feet of construction. The criteria to test wells within 200 feet of the Project was established based upon the local soils, as well as construction methods. Since the Project trenching would be relatively shallow in comparison to the assumed well depths, the influence the Project may have on the aquifer supplying the wells drops off drastically as a function of distance from the excavation. If, during monitoring, it is determined that wells are affected within the 200-foot separation distance, PG&E will extend the distance until it is determined that wells are no longer affected. Implementation of MM-HWQ-2 would reduce impacts to private wells to less than significant.

Water required for hydrostatic testing, HDD operations, and dust control would be obtained from the following sources:

- Public/Private water system (via fire hydrants and irrigation wells);
- Waterways (canals, creeks, or rivers); or
- Water brought in by truck or storage tanks.

The preferred source of water for hydrostatic testing along the route would come from irrigation wells. If irrigation wells could not be secured as a source of water, one of the other sources would be used. PG&E does not plan to acquire water rights, but would negotiate with landowners for water from agricultural wells, or purchase water from irrigation districts or other commercial water sources. Final sources would be determined after drawings are completed and hydrotest procedures are detailed.

As discussed above under Groundwater Flow, potential impacts on groundwater flow would be minimized through the implementation of APM HWQ-3 and APM HWQ-4, as well as APM BIO-20 and APM BIO-21 (further described in Section 4.4, Biological Resources). These APMs would also minimize potential impacts to surface water quality, thereby reducing or eliminating potential contamination of groundwater from Project-related pollutants.

Mitigation Measure for Impact HWQ-2: Private Water Wells

MM HWQ-2. **Verify Well Locations.** Prior to construction of the proposed Project, well locations within 200 feet of the excavation, construction staging areas, and aboveground facility locations shall be verified by PG&E through field surveys to determine if private water wells and water pipelines are currently in use and if their area of influence intersects the proposed Project site. With the landowner's permission, PG&E shall test the wells to determine baseline flow conditions and monitor these wells during construction of the proposed Project. If, through monitoring, it is determined that Project construction is affecting well production, PG&E shall cease construction activities or arrange to supply water at the well location and consult with the landowner. Surveys shall be conducted by PG&E prior to construction to ensure that any unidentified springs are avoided during construction.

<u>Rationale for Mitigation</u>

The mitigation proposed above would ensure that Project construction activities would avoid potential conflicts with private water wells, irrigation wells, and water pipelines. With this measure, potential impacts would be reduced to less than significant.

Impact HWQ-3: 100-Year Floodplain

The Project would place permanent structures within the 100-year floodplain that would be damaged by flooding (Potentially Significant, Class II).

One-hundred-year special flood hazard areas exist in Hungry Hollow (north of Esparto), and a contiguous area beginning at the western end of the Yolo Bypass, extending east through the Natomas Basin area to Sorento Road (just west of the Placer/Sutter county boundary). Figure 4.8-1 depicts the 100-year flood boundaries in the Project area. Western portions of Line 406 that are within Hungry Hollow, west of Dunnigan Hills, traverse many 100-year flood hazard areas. Additionally, all of Line 407 West within and east of the Yolo Bypass would be in 100-year special flood hazard areas, as well as all of the proposed Powerline Road DFM and the portion of Line 407 East situated west of Sorento Road. Other portions of Line 406 and Lines 407 East and West would be outside of flood hazard areas.

As proposed, the pipeline would be installed during the dry season, and no portions of the conduit would be exposed to 100-year floods during Project construction or operation. However, the Powerline Road Pressure Regulating Station and the Powerline Road Main Line Valve structure would potentially be exposed to flooding at their proposed locations. Mitigation is proposed below to flood-proof any structures proposed to be constructed within a 100-year floodplain. Both proposed structures would be no more than 10 feet in height without the flood-proofing. Flood-proofing would require the structures to be raised approximately 1 foot above the 100-year storm flood profile level.

<u>Mitigation Measures for Impact HWQ-3: 100-Year Floodplain</u>

MM HWQ-3 **Flood-Proof Pump Houses Within 100-year Floodplain.** If any structures (pump stations, aboveground valve housing) associated with the buried pipeline are placed within the 100-year flood zone, the structure shall be “flood-proofed” in their foundation design and raised in elevation to a minimum of 1 foot above the 100-year storm flood profile level, to reduce the risk that they would be damaged during such an event.

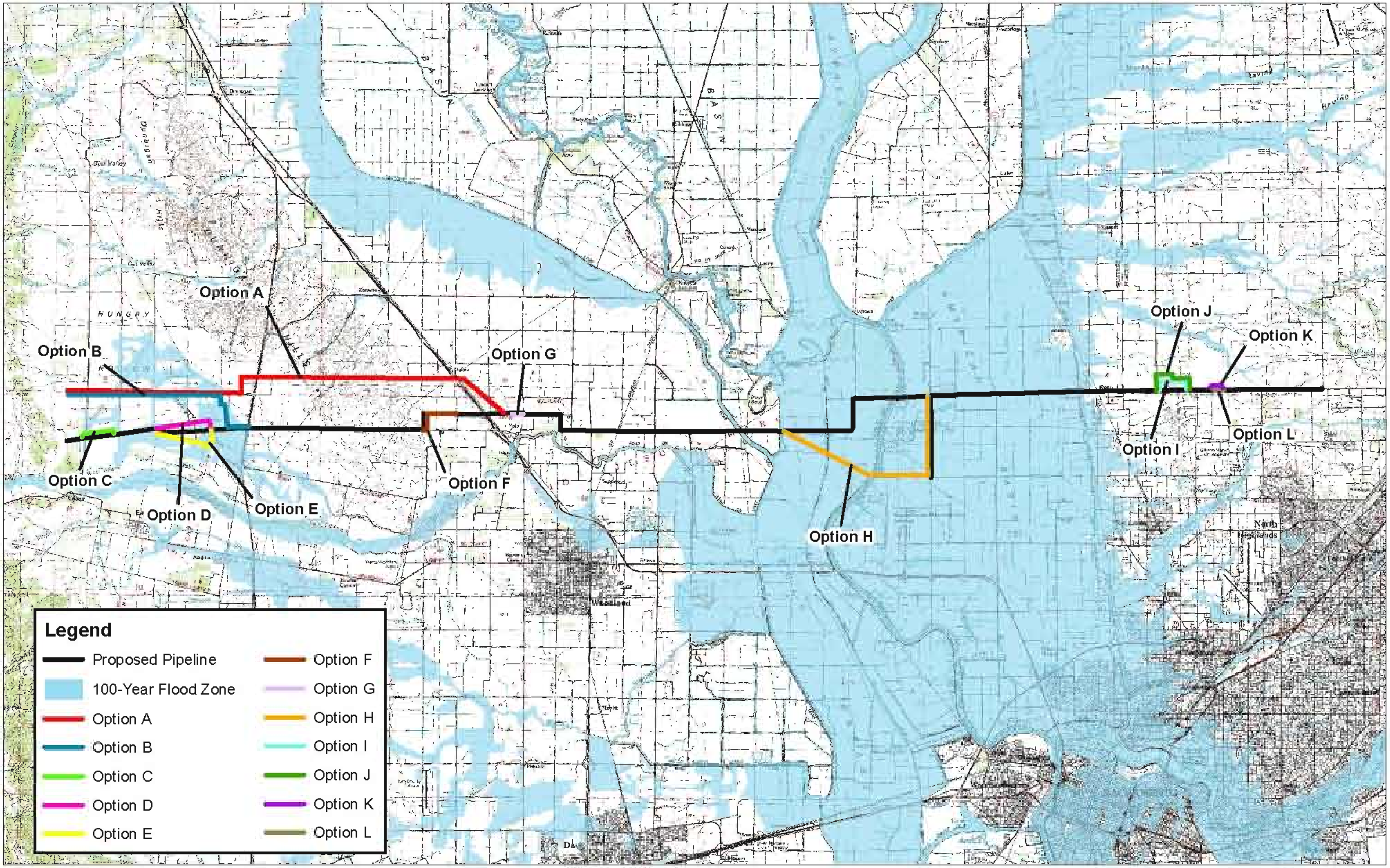
Rationale for Mitigation

The mitigation would reduce the risk that a 100-year flood would catastrophically damage the housing of a pump station, pump, valve, or associated infrastructure, thereby allowing these facilities to continue functioning even during adverse flood conditions. The “flood-proofing” measures may increase the exposed surface area of any pump station, however, the total area would still be not be large enough to impede or redirect flood flows to any significant degree. Implementation of MM HWQ-3 would improve the design of these structures and reduce potential impacts relating to flood damage to less than significant.

4.8.6 Impacts of Alternatives

A No Project Alternative as well as twelve options have been proposed for the alignment in order to minimize or eliminate environmental impacts of the proposed Project and to respond to comments from nearby landowners. The twelve options, labeled A through L, have been analyzed in comparison to the portion of the proposed route that has been avoided as a result of the option. Descriptions of the options can be found in Section 3.0, Alternatives and Cumulative Projects, and are depicted in Figure 3-2A through Figure 3-2G.

For any Project, significant short-term impacts to water quality, groundwater flow, groundwater supply, sedimentation or erosion, drainage and flood patterns, and structural integrity could result from the installation of pipelines, the construction of aboveground stations, and other construction-related activities within the Project site.



Source: Adapted from PG&E 2008, FEMA Q3 Flood Data, USGS 100k Scale DRGs.

Michael Brandman Associates

Figure 4.8-1
100-Year Flood Boundaries in the Project Area

No Project Alternative

Under the No Project Alternative, no impacts to hydrology or water quality would result. A No Project Alternative would eliminate any potential direct or indirect impacts to water quality, groundwater flow, groundwater supply, sedimentation or erosion, drainage and flood patterns, and structural integrity that could result from the installation of pipelines, the construction of aboveground stations, and other construction-related activities. Potential short-term direct impacts to, or the placement of fill within, jurisdictional waters would not occur. Potential long-term indirect impacts to hydrology and water quality as a result of open-cut trenching and construction disturbance within waterways would not occur. Lastly, potential indirect impacts resulting from the unlikely event of a frac-out during horizontal directional drilling procedures, including water quality impairment, would not occur.

Option A

Water Quality

Similar to Line 406, Option A would cross the Hungry Hollow Canal, Goodnow Slough and approximately four smaller agricultural canals. Option A would also cross Smith Creek within the Dunnigan Hills area, whereas Line 406 would not cross this feature.

Similar to Line 406, Option A would cross water features using open-cut trenching or jack-and-bore methods and would require similar regulatory permits from appropriate jurisdictions overseeing the waterways. Because of the additional Smith Creek crossing by Option A, the magnitude of potential water quality impacts would be greater than the proposed Project. However, impacts to water quality under Option A would still be less than significant (Class III) with implementation of APM HWQ-1, APM HWQ-5, APM BIO-7, APM BIO-5, APM BIO-13, APM BIO-16, APM BIO-17, APM BIO-18, APM BIO-19, APM BIO-22 and APM BIO-23. Further, should HDD methods be used to cross water features or highways in the vicinity of water features for Option A, implementation of MM HWQ-1 would be required to reduce potential impacts to less than significant.

Groundwater

Option A would cross approximately 5 fewer private residential parcels than Line 406. Since groundwater wells are commonly associated with residences, it is assumed that the area crossed by Option A would contain fewer groundwater wells than the area crossed by Line 406. Nonetheless, wells used for both residential and agricultural purposes may be present within 200 feet of Option A, resulting in potentially significant impacts (Class II) to groundwater should pipeline construction impact well production or water quality.

Similar to the proposed project, Option A would require implementation of APM HWQ-3, APM HWQ-4, APM BIO-16, APM BIO-20, APM BIO-21 and APM BIO-22 thereby reducing impacts to groundwater flows and quality. Option A would also require implementation of MM HWQ-2, which requires PG&E to locate, test and monitor all wells within 200 feet of the pipeline. If it is determined that Project construction is affecting well production, PG&E shall cease construction activities or arrange to supply water at the well location and consult with the landowner thereby reducing impacts to less than significant.

Floodplains

While Option A would traverse approximately 4,640 feet less of the area designated as being within the 100-year floodplain than Line 406, similar to Line 406, Option A would not construct any permanent aboveground facilities in the 100-year floodplain. Similar to the proposed alignment, Option A would be installed during the dry season and would be completely buried after installation. As such, no portions of the buried pipeline would be exposed to 100-year floods during Project construction or operation. Neither the Capay Metering Station at the western terminus of the pipeline or any substitute station located at the western terminus of Option A would be located within the 100-year floodplain. Similar to Line 406, floodplain-related impacts associated with Option A would be less than significant.

Based on the additional crossing of Smith Creek, Option A would have a greater potential effect on hydrology and water quality than the proposed Project. However, similar to Line 406, impacts would be reduced to less than significant through the implementation of BMPs and mitigation. As such, impacts to hydrology and water quality would be similar to the proposed project.

Option B

Water Quality

Similar to Line 406, Option B would cross the Hungry Hollow Canal and approximately four smaller agricultural canals. Option B pipeline crossings of water features would be conducted using open-cut trenching or jack-and-bore methods and would require similar regulatory permits from appropriate jurisdictions overseeing the waterways. Similar to Line 406, potential water quality impacts associated with Option B would be less than significant (Class III) with implementation of APM HWQ-1, APM HWQ-5, APM BIO-7, APM BIO-5, APM BIO-13, APM BIO-16, APM BIO-17, APM BIO-18, APM BIO-19, APM BIO-22 and APM BIO-23. Further, should HDD methods be used to cross water features or highways in the vicinity of water features for Option B, implementation of MM HWQ-1 would be required to reduce potential impacts to less than significant.

Groundwater

Option B would cross approximately two more private residential parcels than Line 406. Since groundwater wells are commonly associated with residences, it is assumed that the area crossed by Option B may contain more groundwater wells than the area crossed by Line 406. Similar to Line 406, wells used for agricultural purposes may also be present within 200 feet of Option B. Potentially significant impacts to groundwater would occur should pipeline construction affect well production or water quality (Class II). Option B would require implementation of APM HWQ-3, APM HWQ-4, APM BIO-16, APM BIO-20, APM BIO-21 and APM BIO-22, thereby reducing impacts to groundwater flows and quality. Option B would also require implementation of MM HWQ-2, which requires PG&E to locate, test and monitor all wells within 200 feet of the pipeline. If it is determined that Project construction is affecting well production PG&E shall cease construction activities or arrange to supply water at the well location and consult with the landowner thereby reducing impacts to less than significant.

Floodplains

Option B would traverse approximately 3,757 feet more of the area designated as being within the 100-year floodplain than Line 406. Similar to the proposed alignment, Option B would be installed during the dry season and would be completely buried after installation. As such, no portions of the buried pipeline would be exposed to 100-year floods during Project construction or operation. Neither the Capay Metering Station at the western terminus of the pipeline or any substitute station located at the western terminus of Option B would be located within the 100-year floodplain. Similar to the impacts described above for Line 406, floodplain-related impacts associated with Option B would be less than significant.

Based on the similarities and extent of potential impacts, Option B would have no more or no less of an effect on hydrology and water quality than the proposed Project after the implementation of appropriate APMs and MMs.

Option C

Water Quality

Option C would cross the Hungry Hollow Canal at a location approximately 450 feet north of the proposed Line 406 crossing.

Similar to Line 406, the Option C crossing of Hungry Hollow Canal would employ open-cut trenching. However, Option C would run parallel to the canal for approximately 450 feet, which would result in a greater distance of trenching along the canal. This would result in increased opportunities for erosion to affect the Canal. Impacts to water quality under the proposed alignment would be less than significant due to the implementation APM HWQ-1, APM HWQ-5, APM BIO-7, APM BIO-5, APM BIO-13, APM BIO-16, APM BIO-17, APM BIO-18, APM BIO-19, APM BIO-22 and APM BIO-23. These APMs would also be implemented under Option C, resulting in a less than significant impact to water quality.

Groundwater

Both Option C and the corresponding portion of Line 406 are not within 200 feet of a private residential parcel. As such, it can be assumed that no groundwater wells are located in this area. However, wells used for agricultural purposes may be present within 200 feet of both Option C and Line 406. Potentially significant impacts to groundwater would occur should pipeline construction impact well production or water quality (Class II). Similar to the proposed project, Option C would implement APM HWQ-3, APM HWQ-4, APM BIO-16, APM BIO-20, APM BIO-21 and APM BIO-22 thereby reducing impacts to groundwater flows and quality. Option C would also require implementation of MM HWQ-2, which requires PG&E to locate, test and monitor all wells within 200 feet of the pipeline. If it is determined that Project construction is affecting well production PG&E shall cease construction activities or arrange to supply water at the well location and consult with the landowner thereby reducing impacts to less than significant.

Floodplains

Option C would traverse approximately 215 feet more of the area designated as being within the 100-year floodplain than Line 406. Similar to the proposed alignment, Option C would be installed during the dry season and would be completely buried after installation. As such, no portions of the buried pipeline would be exposed to 100-year floods during Project construction or operation. Similar to the impacts described above for Line 406, floodplain-related impacts associated with Option C would be less than significant.

Based on the greater extent of potential impacts along Hungry Hollow Canal, Option C would have a greater potential effect on hydrology and water quality than the proposed Project. However, similar to Line 406, impacts would be reduced to less than significant through the implementation of BMPs and mitigation. As such, impacts to hydrology and water quality would be similar to the proposed project.

Option D

Water Quality

Option D would traverse approximately 6 unnamed irrigation canals whereas Line 406 would cross approximately 11 unnamed irrigation canals.

Similar to Line 406, Option D pipeline crossings of water features would be conducted using open-cut trenching or jack-and-bore methods and would require similar regulatory permits from appropriate jurisdictions overseeing the waterways. Impacts to water quality under the proposed alignment would be less than significant (Class III) due to the implementation of APM HWQ-1, APM HWQ-5, APM BIO-7, APM BIO-5, APM BIO-13, APM BIO-16, APM BIO-17, APM BIO-18, APM BIO-19, APM BIO-22 and APM BIO-23. These APMs would also be implemented under Option D, resulting in a less than significant impact to water quality.

Groundwater

Option D would cross approximately 5 more private residential parcels than Line 406. Since groundwater wells are commonly associated with residences, it is assumed that the area crossed by Option D would contain more groundwater wells than the area crossed by Line 406. Similar to Line 406, wells used for agricultural purposes may also be present within 200 feet of Option D. Potentially significant impacts to groundwater would occur should pipeline construction impact well production or water quality (Class II). Similar to the proposed project, Option D would implement APM HWQ-3, APM HWQ-4, APM BIO-16, APM BIO-20, APM BIO-21 and APM BIO-22 thereby reducing impacts to groundwater flows and quality. Option D would also require implementation of MM HWQ-2, which requires PG&E to locate, test and monitor all wells within 200 feet of the pipeline. If it is determined that Project construction is affecting well production PG&E shall cease construction activities or arrange to supply water at the well location and consult with the landowner thereby reducing impacts to less than significant.

Floodplains

Option D would traverse approximately 235 feet more of the area designated as being within the 100-year floodplain than Line 406. Similar to the proposed alignment, Option D would be installed during the dry season and would be completely buried after installation. As such, no portions of the buried pipeline would be exposed to 100-year floods during Project construction or operation. Similar to the impacts described above for Line 406, floodplain-related impacts associated with Option D would be less than significant.

Based on the similarities and extent of potential impacts, Option D would have no more or less of an effect on hydrology and water quality than the proposed Project after the implementation of appropriate APMs and MMs.

Option E

Water Quality

Option E would traverse approximate 9 unnamed irrigation canals whereas Line 406 would cross approximately 11 unnamed irrigation canals.

Similar to Line 406 Option E pipeline crossings of water features would be conducted using open-cut trenching or jack-and-bore methods and would require similar regulatory permits from appropriate jurisdictions overseeing the waterways. Impacts to water quality under the proposed alignment would be less than significant (Class III) due to the implementation of APM HWQ-1, APM HWQ-5, APM BIO-7, APM BIO-5, APM BIO-13, APM BIO-16, APM BIO-17, APM BIO-18, APM BIO-19, APM BIO-22 and APM BIO-23. These APMs would also be implemented under Option E, resulting in a less than significant impact to water quality.

Groundwater

Option E would cross approximately 3 more private residential parcels than Line 406. Since groundwater wells are commonly associated with residences it is assumed that the area crossed by Option E would contain more groundwater wells than the area crossed by Line 406. Similar to Line 406, wells used for agricultural purposes may also be present within 200 feet of Option E. Potentially significant impacts to groundwater would occur should pipeline construction impact well production or water quality (Class II). Similar to the proposed project, Option E would implement APM HWQ-3, APM HWQ-4, APM BIO-16, APM BIO-20, APM BIO-21 and APM BIO-22 thereby reducing impacts to groundwater flows and quality. Option E would also require implementation of MM HWQ-2, which requires PG&E to locate, test, and monitor all wells within 200 feet of the pipeline. If it is determined that Project construction is affecting well production PG&E shall cease construction activities or arrange to supply water at the well location and consult with the landowner thereby reducing impacts to less than significant.

Floodplains

Option E would traverse approximately 1,732 feet more of the area designated as being within the 100-year floodplain than Line 406. Similar to the proposed alignment, Option E would be installed during the dry season and would be completely buried after installation. As such, no portions of the buried pipeline would be exposed to 100-year floods during Project construction or operation. Similar to the impacts described above for Line 406, floodplain-related impacts associated with Option E would be less than significant.

Based on the similarities and extent of potential impacts, Option E would have no more or less of an effect on hydrology and water quality than the proposed Project after the implementation of appropriate APMs and MMs.

Option F

Option F would traverse approximately 3 irrigation ditches, the same as Line 406.

Water Quality

Similar to Line 406, Option F pipeline crossings of water features would be conducted using open-cut trenching or jack-and-bore methods and would require similar regulatory permits from appropriate jurisdictions overseeing the waterways. Impacts to water quality under the proposed alignment would be less than significant (Class III) due to the implementation of APM HWQ-1, APM HWQ-5, APM BIO-7, APM BIO-5, APM BIO-13, APM BIO-16, APM BIO-17, APM BIO-18, APM BIO-19, APM BIO-22 and APM BIO-23. These APMs would also be implemented under Option F, resulting in a less than significant impact to water quality.

Groundwater

Option F would cross 1 less private residential parcel than the corresponding portion of Line 406. Similar to Line 406, wells used for agricultural purposes may be present within 200 feet of Option F. Potentially significant impacts to groundwater would occur should pipeline construction impact well production or water quality (Class II). Similar to the proposed project, Option F would implement APM HWQ-3, APM HWQ-4, APM BIO-16, APM BIO-20, APM BIO-21 and APM BIO-22 thereby reducing impacts to groundwater flows and quality. Option F would also require implementation of MM HWQ-2, which requires PG&E to locate, test, and monitor all wells within 200 feet of the pipeline. If it is determined that Project construction is affecting well production PG&E shall cease construction activities or arrange to supply water at the well location and consult with the landowner thereby reducing impacts to less than significant.

Floodplains

Neither Option F or the corresponding portion of Line 406 would traverse an area designated as being within the 100-year floodplain. Similar to the proposed project, impacts would be less than significant.

Based on the similarities and extent of potential impacts, Option F would have no more or less of an effect on hydrology and water quality than the proposed Project after the implementation of appropriate APMs and MMs..

Option G

Water Quality

The alignment considered for Option G would cross the same irrigation ditches as the proposed alignment.

Similar to Line 406, Option G pipeline crossings of water features would be conducted using open-cut trenching or jack-and-bore methods and would require similar regulatory permits from appropriate jurisdictions overseeing the waterways. Impacts to water quality under the proposed alignment would be less than significant (Class III) due to the implementation of APM HWQ-1, APM HWQ-5, APM BIO-7, APM BIO-5, APM BIO-13, APM BIO-16, APM BIO-17, APM BIO-18, APM BIO-19, APM BIO-22 and APM BIO-23. These APMs would also be implemented under Option G, resulting in a less than significant impact to water quality.

Groundwater

Option G would run between three private residential parcels, where the proposed Project would traverse an area slightly to the north of these residences. Since groundwater wells are commonly associated with residences, it is assumed that the area crossed by Option G would likely be in closer proximity to any existing wells than the area crossed by Line 406. Similar to Line 406, wells used for agricultural purposes may also be present within 200 feet of Option G. Potentially significant impacts to groundwater would occur should pipeline construction impact well production or water quality (Class II). Similar to the proposed project, Option G would implement APM HWQ-3, APM HWQ-4, APM BIO-16, APM BIO-20, APM BIO-21 and APM BIO-22 thereby reducing impacts to groundwater flows and quality. Option G would also require implementation of MM HWQ-2, which requires PG&E to locate, test and monitor all wells within 200 feet of the pipeline. If it is determined that Project construction is affecting well production PG&E shall cease construction activities or arrange to supply water at the well location and consult with the landowner thereby reducing impacts to less than significant.

Floodplains

Neither Option G or the corresponding portion of Line 406 would traverse an area designated as being within the 100-year floodplain. Similar to the proposed project, impacts would be less than significant (Class III).

Based on the similarities and extent of potential impacts, Option G would have no more or less of an effect on hydrology and water quality than the proposed Project after the implementation of appropriate APMs and MMs.

Option H

Water Quality

Both Option H and the proposed Project would cross the East Yolo Bypass Drainage, Spangler Canal and Sacramento River via HDD methods. However, the proposed project would cross approximately 10 irrigation ditches while Option H would cross 15 ditches.

Similar to the proposed Project, Option H pipeline crossings of water features would be conducted using open-cut trenching, jack-and-bore or HDD methods and would require similar regulatory permits from appropriate jurisdictions overseeing the waterways. Impacts to water quality under the proposed Project would be less than significant (Class III) due to the implementation of APM HWQ-1, APM HWQ-5, APM BIO-7, APM BIO-5, APM BIO-13, APM BIO-16, APM BIO-17, APM BIO-18, APM BIO-19, APM BIO-22 and APM BIO-23 as well as MM HWQ-1. These APMs and MM HWQ-1 would also be implemented under Option H, resulting in a less than significant impact to water quality.

Groundwater

Option H would cross approximately 3 fewer private residential parcels than Line 406. Since groundwater wells are commonly associated with residences it is assumed that the area crossed by Option H would contain less groundwater wells than the area crossed by Line 406. Similar to Line 406, wells used for agricultural purposes may also be present within 200 feet of Option H. Potentially significant impacts to groundwater would occur should pipeline construction impact well production or water quality (Class II). Similar to the proposed project, Option H would implement APM HWQ-3, APM HWQ-4, APM BIO-16, APM BIO-20, APM BIO-21 and APM BIO-22 thereby reducing impacts to groundwater flows and quality. Option H would also require implementation of MM HWQ-2, which requires PG&E to locate, test, and monitor all wells within 200 feet of the pipeline. If it is determined that Project construction is affecting well production PG&E shall cease construction activities or arrange to supply water at the well location and consult with the landowner thereby reducing impacts to less than significant.

Floodplains

Option H would traverse approximately 3,175 feet less of the area designated as being within the 100-year flood plan than Line 407 West. Similar to the proposed alignment, Option H would be installed during the dry season and would be completely buried after installation. As such, no portions of the buried pipeline would be exposed to 100-year floods during Project construction or operation. Similar to the proposed Project, both the Power Line Road Regulating Station and the Power Line Road Main Line Valve would be located within the 100-year floodplain. As such, impacts would be Potentially significant (Class II) and require MM HWQ-3 included in the proposed project. MM HWQ-3 would require the flood proofing of any structures associated with the above ground stations, including but not limited to, the elevation of structures to 1-foot above the 100-year storm flood profile level. Implementation of MM HWQ-3 in both the proposed project and Option H would reduce impacts to less than significant.

Based on the similarities and extent of potential impacts, Option H would have no more or less of an effect on hydrology and water quality than the proposed Project after the implementation of appropriate APMs and MMs.

Option I

Water Quality

Option I would require crossing 2 irrigation ditches that the proposed alignment would not cross. Furthermore, Option I would cross agricultural fields that may be used as rice fields. Similar to the proposed Project, Option I would require waterbody crossing over at least one part of Steelhead Creek, a 303(d) designated waterbody (PG&E 2009, Appendix C-1).

Similar to Line 407 East, Option I pipeline crossings of water features would be conducted using open-cut trenching or jack-and-bore methods and would require similar regulatory permits from appropriate jurisdictions overseeing the waterways. Impacts to water quality under the proposed alignment would be less than significant due to the implementation of APM HWQ-1, APM HWQ-5, APM BIO-7, APM BIO-5, APM BIO-13, APM BIO-16, APM BIO-17, APM BIO-18, APM BIO-19, APM BIO-22 and APM BIO-23. These APMs would also be implemented under Option I, resulting in a less than significant impact to water quality.

Groundwater

Option I would cross approximately 5 fewer private residential parcels than Line 407 East. Since groundwater wells are commonly associated with residences, it is assumed that the area crossed by Option I would contain fewer groundwater wells than the area crossed by Line 406. Nonetheless, wells used for both residential and agricultural purposes may be present within 200 feet of Option I resulting in potentially significant impacts to groundwater should pipeline construction impact well production or water quality (Class II). Similar to the proposed project, Option I would implement APM HWQ-3, APM HWQ-4, APM BIO-16, APM BIO-20, APM BIO-21 and APM BIO-22 thereby reducing impacts to groundwater flows and quality. Option I would also require implementation of MM HWQ-2, which requires PG&E to locate, test and monitor all wells within 200 feet of the pipeline. If it is determined that Project construction is affecting well production PG&E shall cease construction activities or arrange to supply water at the well location and consult with the landowner thereby reducing impacts to less than significant.

Floodplains

Neither Option I nor the corresponding portion of Line 407 East would traverse an area designated as being within the 100-year floodplain. Similar to the proposed project, impacts would be less than significant.

Based on the similarities and extent of potential impacts, Option I would have no more or less of an effect on hydrology and water quality than the proposed Project after the implementation of appropriate APMs and MMs.

Option J

Water Quality

Option J would require crossing 2 irrigation ditches that the proposed alignment would not cross. Furthermore, Option J would cross agricultural fields that may be used as rice fields. Similar to the proposed Project, Option J would require waterbody crossing over at least one part of Steelhead Creek, a 303(d) designated waterbody (PG&E 2009, Appendix C-1).

Similar to Line 406, Option J pipeline crossings of water features would be conducted using open-cut trenching or jack-and-bore methods and would require similar regulatory permits from appropriate jurisdictions overseeing the waterways. Impacts to water quality under the proposed alignment would be less than significant (Class III) due to the implementation of APM HWQ-1, APM HWQ-5, APM BIO-7, APM BIO-5, APM BIO-13, APM BIO-16, APM BIO-17, APM BIO-18, APM BIO-19, APM BIO-22 and APM BIO-23. These APMs would also be implemented under Option J, resulting in a less than significant impact to water quality.

Groundwater

Option J would cross approximately 3 fewer private residential parcels than Line 407 East. Since groundwater wells are commonly associated with residences, it is assumed that the area crossed by Option J would contain fewer groundwater wells than the area crossed by Line 406. Nonetheless, wells used for both residential and agricultural purposes may be present within 200 feet of Option J resulting in potentially significant impacts to groundwater should pipeline construction impact well production or water quality (Class II). Similar to the proposed project, Option J would implement APM HWQ-3, APM HWQ-4, APM BIO-16, APM BIO-20, APM BIO-21 and APM BIO-22 thereby reducing impacts to groundwater flows and quality. Option J would also require implementation of MM HWQ-2, which requires PG&E to locate, test, and monitor all wells within 200 feet of the pipeline. If it is determined that Project construction is affecting well production PG&E shall cease construction activities or arrange to supply water at the well location and consult with the landowner thereby reducing impacts to less than significant.

Floodplains

Neither Option J nor the corresponding portion of Line 407 East would traverse an area designated as being within the 100-year floodplain. Similar to the proposed project, impacts would be less than significant.

Based on the similarities and extent of potential impacts, Option J would have no more or less of an effect on hydrology and water quality than the proposed Project after the implementation of appropriate APMs and MMs.

Option K

Water Quality

Option K would not require crossing any additional irrigation ditches but would require crossing an additional vernal pool.

Similar to Line 407 East, Option K pipeline crossings of water features would be conducted using open-cut trenching, jack-and-bore or HDD methods and would require similar regulatory permits from appropriate jurisdictions overseeing the waterways. Impacts to water quality under the proposed alignment would be less than significant (Class III) due to the implementation of APM HWQ-1, APM HWQ-5, APM BIO-7, APM BIO-5, APM BIO-13, APM BIO-16, APM BIO-17, APM BIO-18, APM BIO-19, APM BIO-22 and APM BIO-23 as well as MM HWQ-1. These APMs and MM HWQ-1 would also be implemented under Option K, resulting in a less than significant impact to water quality.

Groundwater

Both Option K and the corresponding portion of Line 407 East are not within 200 feet of a private residential parcel. As such, it can be assumed that no groundwater wells are located in this area. However, wells used for agricultural purposes may be present with 200 feet of both Option K and Line 407 east. Potentially significant impacts to groundwater would occur should pipeline construction impact well production or water quality (Class II). Similar to the proposed project, Option K would implement APM HWQ-3, APM HWQ-4, APM BIO-16, APM BIO-20, APM BIO-

21 and APM BIO-22 thereby reducing impacts to groundwater flows and quality. Option K would also require implementation of MM HWQ-2, which requires PG&E to located, test and monitor all wells within 200 feet of the pipeline. If it is determined that Project construction is affecting well production PG&E shall cease construction activities or arrange to supply water at the well location and consult with the landowner thereby reducing impacts to less than significant.

Floodplains

Neither Option K nor the corresponding portion of Line 407 East would traverse an area designated as being within the 100-year floodplain. Similar to the proposed project, impacts would be less than significant.

Based on the similarities and extent of potential impacts, Option K would have no more or less of an effect on hydrology and water quality than the proposed Project after the implementation of appropriate APMs and MMs.

Option L

Water Quality

Option L would not cross additional irrigation ditches and, similar to the corresponding portion of Line 407 East, would utilize HDD to cross the existing swale.

Similar to Line 407 East, Option L would be constructed using HDD methods in order to reduce impacts to surface water features and would require similar regulatory permits from appropriate jurisdictions overseeing the waterways. Impacts to water quality under the proposed alignment would be less than significant (Class III) due to the implementation of APM HWQ-1, APM HWQ-5, APM BIO-7, APM BIO-5, APM BIO-13, APM BIO-16, APM BIO-17, APM BIO-18, APM BIO-19, APM BIO-22 and APM BIO-23 as well as MM HWQ-1. These APMs and MM HWQ-1 would also be implemented under Option L, resulting in a less than significant impact to water quality.

Groundwater

Both Option L and the corresponding portion of Line 407 East are not within 200 feet of a private residential parcel. As such, it can be assumed that no domestic groundwater wells are located in this area. However, wells used for agricultural purposes may be present with 200 feet of both Option L and Line 407 East.

Potentially significant impacts to groundwater would occur should pipeline construction impact well production or water quality (Class II). Similar to the proposed project, Option L would implement APM HWQ-3, APM HWQ-4, APM BIO-16, APM BIO-20, APM BIO-21 and APM BIO-22 thereby reducing impacts to groundwater flows and quality. Option L would also require implementation of MM HWQ-2, which requires PG&E to locate, test and monitor all wells within 200 feet of the pipeline. If it is determined that Project construction is affecting well production PG&E shall cease construction activities or arrange to supply water at the well location and consult with the landowner thereby reducing impacts to less than significant.

Floodplains

Neither Option L nor the corresponding portion of Line 407 East would traverse an area designated as being within the 100-year floodplain. Similar to the proposed project, impacts would be less than significant. Based on the similarities and extent of potential impacts, Option L would have no more or less of an effect on hydrology and water quality than the proposed Project after the implementation of appropriate APMs and MMs.

Table 4.8-2: Comparison of Alternatives for Hydrology and Water Quality

Alternative	Comparison with Proposed Project
No Project	No Impacts
Option A	Similar Impacts
Option B	Similar Impacts
Option C	Similar Impacts
Option D	Similar Impacts
Option E	Similar Impacts
Option F	Similar Impacts
Option G	Similar Impacts
Option H	Similar Impacts
Option I	Similar Impacts
Option J	Similar Impacts
Option K	Similar Impacts
Option L	Similar Impacts
Source: Michael Brandman Associates 2009.	

4.8.6 Cumulative Projects Impact Analysis

The cumulative environment for water resources includes the Sacramento River Hydrologic Region, which covers approximately 17.4 million acres (27,200 square miles). The proposed Project is situated at the southern end of the Sacramento Valley Groundwater Basin with the primary water bearing formations comprised of sedimentary continental deposits of Late Tertiary (Pliocene) to Quaternary (Holocene) age. From a water quality perspective, the Sacramento River from Knights Landing to the Sacramento-San Joaquin Delta is identified in the 2006 California section 303(d) List and total maximum daily load (TMDL) Priority Schedule as an impaired water body for the following contaminants: mercury and unknown toxicity (RWQCB 2006). The northern portion of the Sacramento-San Joaquin Delta downstream of the Project area has been designated as impaired for a variety of contaminants, including pesticides (chlorpyrifos, dichloro-diphenyl-trichloro-ethane [DDT], diazinon, and Group A pesticides) resulting from agricultural and urban runoff/storm sewers, mercury (from abandoned mine drainage), polychlorinated biphenyls (PCBs), exotic species, and unknown toxicity (unknown cause) (RWQCB 2006).

Other projects within this Project's vicinity that would affect hydrology and water quality include the Sutter Pointe Specific Plan and associated roads projects, the Placer Vineyards Specific Area Plan and associated roads projects, the Sierra Vista Specific Plan, and the Natomas Levee Improvement Plan. The Sutter Pointe Specific Plan and new associated roads projects may potentially result in adverse impacts to Pleasant Grove Creek Canal, the North Main Canal, and a number of unnamed irrigation canals. The Placer Vineyards Specific Area Plan and Sierra Vista Specific Plan and their road improvement projects may result in impacts to Dry Creek and its tributaries. The Natomas Levee Improvement Plan may result in impacts to the Sacramento River. Concurrent with the proposed Project, the construction of these projects would result in an overall increase of potential affects to water resources within the cumulative environment.

Major water crossings for the Project within the cumulative environment include the Sacramento River and several tributaries, as well as the Yolo Basin (including Tule Canal). The crossing of these features could result in water quality impairment relating to erosion and sedimentation. Of the projects that occur in the vicinity of the proposed Project and within the cumulative environment, the Natomas Levee Improvement Plan is the only project that would include potential impacts to the Sacramento River as a result of proposed levee improvements. The Natomas

Levee Improvement Plan includes raising, reinforcing, and reshaping existing levees. Impacts to the Sacramento River and its tributaries resulting from the proposed Project and the Natomas Levee Improvement Plan would be cumulatively considerable and potentially significant due to the considerable and potentially significant effects of the Natomas Levee Improvement Plan.

The proposed Project would employ HDD methodologies in the crossing of the Sacramento River and its major tributaries, thereby avoiding any direct impacts to these features. The potential indirect impacts resulting from construction related runoff and/or the unlikely event of a frac-out would be minimized and reduced to less than significant levels through the implementation of APM HWQ-1, APM HWQ-5, APM BIO-7, APM BIO-13, and APM BIO-23. With the implementation of these measures, the proposed Project's contribution to the cumulative impacts to the Sacramento River and its major tributaries would be considered less than significant, and no additional mitigation would be required above and beyond that which is proposed at the Project level.

Climate change may also have a cumulative effect on water resources. Snow pack in the mountains is expected to decrease, and may subsequently lead to a decrease in streamflow and groundwater recharge (Climate Action Team [CAT] Report March 2006) in the area of this Project. The potential decrease in streamflows, and therefore flooding, would result in a lower risk of stream channel erosion that could expose the pipeline. An exposed pipeline within the stream channel could be ruptured and result in water quality impacts due to natural gas being released into the stream or river. However, because the Project would not result in changes to streamflows or groundwater recharge, and climate change may reduce streamflows and flooding, there would be a reduced risk of water quality impacts from pipeline exposure and rupture.

Another potential result of climate change in the Project area would be an increase in sea levels (CAT Report March 2006) that may potentially increase buoyancy of the pipeline within areas of saltwater intrusion. Increased buoyancy would be a concern because it could lead to a higher risk of pipeline exposure and rupture within the stream channel that could lead to water quality impacts. However, the largest sea level rise predicted of 30 inches (CAT Report March 2006) would not be high enough to affect streams and rivers in the Project area (http://geology.com/sea-level-rise/san-francisco.shtml).

4.8.7 Summary of Impacts and Mitigation Measures

The proposed Project could result in potentially significant impacts in violation of Federal or State Agency quantitative or qualitative water quality criteria, standards, or objectives (including objectives promulgated by the CVRWQCB and criteria set forth in the proposed California Toxics Rule) during the construction phase. Impacts would be less than significant with the implementation of APM HWQ-1, APM HWQ-2, APM HWQ-5, APM BIO-5, APM BIO-7, APM BIO-13, APM BIO-23, and MM HWQ-1

The proposed Project could result in potentially significant impacts to private groundwater supplies as construction of the Project could impact private water wells, irrigation wells, and water pipelines. Impacts would be reduced to less than significant with the implementation of APM HWQ-3, APM HWQ-4, APM BIO-20, APM BIO-21, and MM HWQ-2.

The proposed Project could result in potentially significant impacts through placement of permanent structures within the 100-year floodplain that would be damaged by flooding. Impacts would be reduced to a less than significant level through the implementation of MM HWQ-3.

Table 4.8-3: Summary of Hydrology and Water Quality Impacts and Mitigation Measures

Impact	Mitigation Measure
HWQ-1. Federal or state water quality standards.	**HWQ-1.** Response to unanticipated release of drilling fluids.
HWQ-2. Groundwater for municipal or private purposes.	**HWQ-2.** Verify well locations.
HWQ-3. 100-year floodplain	**HWQ-3.** Flood-proof pump houses within 100-year floodplain.
Source Michael Brandman Associates 2009.	

4.9 LAND USE AND PLANNING

This Section addresses the environmental setting, impacts and mitigation measures for the proposed Project related to land use and planning. Included are descriptions of the environmental setting in terms of existing land uses that could be affected by the proposed alignment. Federal, State, and local plans that could affect the Project construction and operation are also discussed.

4.9.1 Environmental Setting

This Section presents information on existing land uses along the proposed pipeline alignment. It identifies sensitive land uses such as schools, residential, biological preserves, and recreation and open space areas adjacent to and near the proposed alignment. The land use inventory was conducted by examining and verifying data provided by PG&E, aerial photographs, and field reconnaissance. The study area boundary includes lands within the pipeline right-of-way (ROW) and lands beyond the ROW that could be affected by construction or operational activities.

The study area width for sensitive land uses extends from the alignment itself approximately 660 feet on either side of the proposed pipeline. Areas at risk of pipeline releases are known as High Consequence Areas (HCAs). Federal DOT regulations define area classifications, based on population density of the pipeline vicinity and on an area that extends for 660 feet (220 yards) on either side of the centerline of any continuous one-mile length of the pipeline. The class locations along the proposed pipeline route are shown in Figure 2-7.

The risk analysis performed for the proposed project is located in Section 4.7, Hazards and Hazardous Materials. School districts require a 1,500-foot distance for hazardous land uses near school sites, per Title 5, section 14010, of the California Code of Regulations - Standards for School Site Selection. Two planned school sites within the Placer Vineyards Specific Plan area (an HCA) are located within 1,500 feet of the proposed Project pipeline along Base Line Road. Alternative Options I, J, K, and L were included in this Draft EIR to address the planned school sites.

Existing Land Use Types. The proposed pipeline alignment traverses lands in Sutter County, Yolo County, Sacramento County, Placer County, and is within the Sphere of Influence of the City of Roseville. The area along the proposed alignment passes through predominantly agricultural or undeveloped areas. Existing land use reported below generally reflects those uses within a 0.5 mile of the proposed pipeline alignment. Table 4.9-1 shows the general land use categories that classify the types of uses within or adjacent to the proposed Project alignment. Figures 2-3, 2-4, 2-5, and 2-6 show aerial photograph views of the types of land uses that occur along the

Table 4.9-1: Existing Land Uses and General Plan Land Use Designations along the Proposed Project Alignment

Route Segment	County	Existing Land Use	Designated Land Use
From tie-in to Lines 400 and 401 to Dunnigan Hills	Yolo	Cultivated Agricultural Lands (Disced, Fallow, Row Crop, Orchard, Pasture)	Agriculture
Dunnigan Hills	Yolo	Cultivated Agricultural Lands Range Land Residential	Agriculture Very Low Density Residential Low Density Residential
Interstate 5 to the tie-in with Line 172A	Yolo	Cultivated Agricultural Lands Residential	Very Low Density Residential
Lines 406 and 172A tie-in point to Sacramento River	Yolo	Cultivated Agricultural Lands Orchards Residential	Agriculture Very Low Density Residential Low Density Residential Open Space
Yolo/Sutter County boundary at Sacramento River to Powerline Road	Sutter	Habitat Preserve Zones (Natomas Basin Conservancy Mitigation Lands) Orchards	Open Space Industrial
From Intersection of Powerline Road and Riego Road south to Elverta Road (the Distribution Feeder Main (DFM))	Sutter and Sacramento	Agriculture (primarily rice fields)	Agriculture Industrial
Intersection of Powerline Road and Riego Road to Steelhead Creek	Sutter	Agriculture (primarily rice fields and pasture) Industrial Residential	Industrial (Sutter Pointe Specific Plan area)

Route Segment	County	Existing Land Use	Designated Land Use
Steelhead Creek to Sutter/Placer County boundary	Sutter	Agriculture (mainly pasture)	Industrial Low Density Residential
Sutter/Placer County boundary to Line 123 Tie-in	Placer	Agriculture (primarily grazing land) Light commercial Residential	Agriculture Very Low Density Residential Low Density Residential Urban Reserve (South side of Base Line Road - adopted Placer Vineyards Specific Plan area) (North side of Base Line Road - Curry Creek Community Plan area and Sierra Vista Specific Plan area)
Source: PG&E 2007; California Resources Agency.			

Existing land uses include the following definitions (PG&E 2007):

- Range Land: These areas are mostly hilly or sloping terrain with little or no discing (except for firebreaks). They include some oak woodland areas and open rangeland.
- Orchards: These consist primarily of nut tree orchards (almond or walnut), but also include some fruit and olive orchards.
- Disced, Fallow, Row Crop, or Improved Pasture: These are areas that show some improvements, such as evidence of complete or partial leveling, discing, or use for row plants. Some of these fields have been used for row crops (tomatoes, squash, sunflowers, asparagus, or other crop) while others have been used for fodder production (hay or alfalfa).
- Urban, Residential, Commercial, or Industrial: Developed areas include the portions of the Project area characterized by buildings, roads, equipment storage areas, and the surrounding areas with horticultural vegetation. Where these areas are large enough, these properties are mapped separately from the surrounding land use.

Land Uses along Line 406

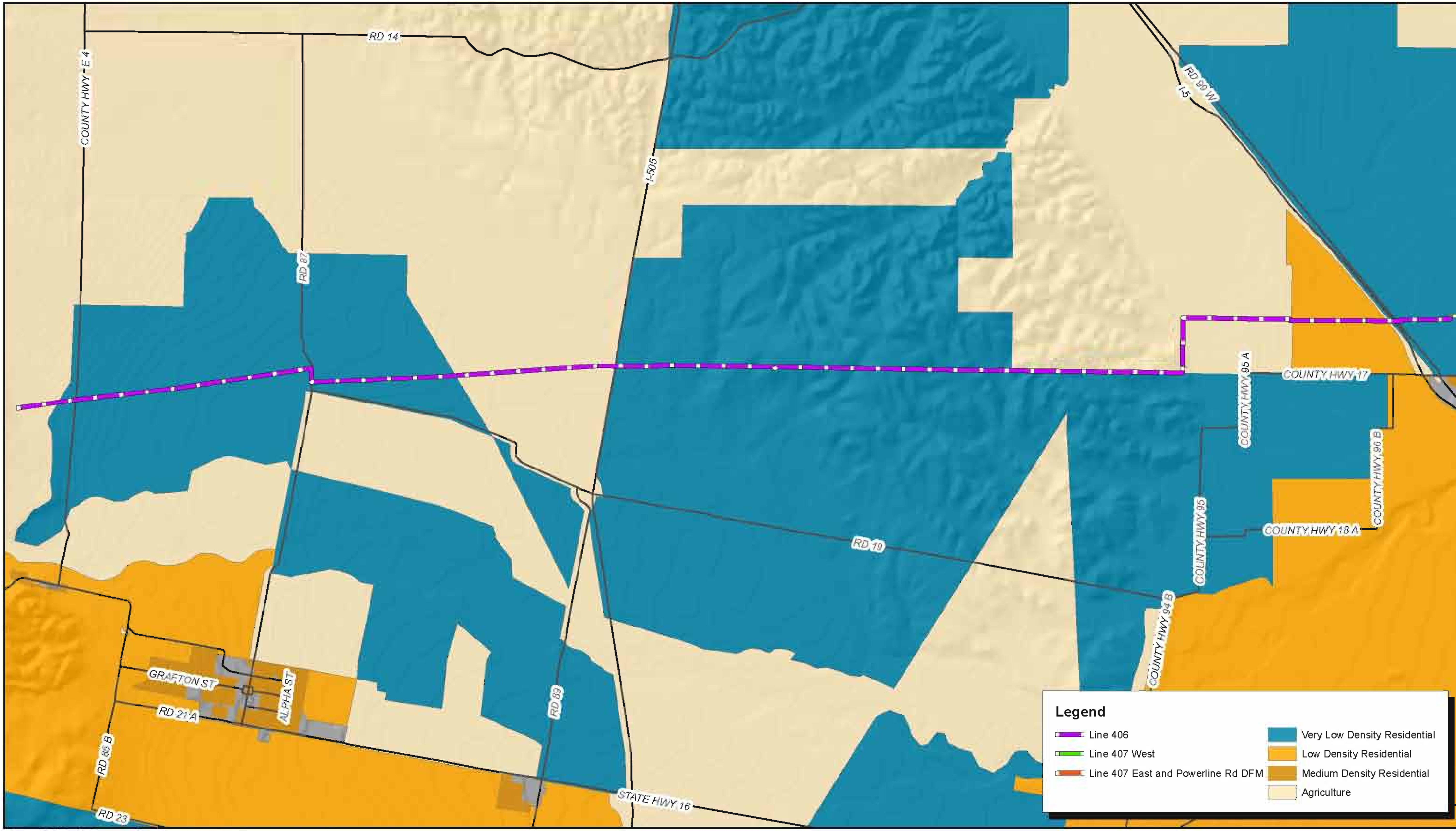
Line 406 is located entirely in north-central Yolo County and extends from the existing Lines 400 and 401 to the existing Line 172A for approximately 14 miles through unincorporated areas of Yolo County. This area is generally used for agricultural production. See Figure 4.9-1A for land uses along the proposed Project.

Disced, fallow, row crop, or improved pastures dominate the mostly flat alignment areas from the tie-in with Lines 400 and 401 to the Dunnigan Hills, where the land use becomes predominately grazing land. Seasonal wetlands and creek crossings are also found in the Dunnigan Hills area. The Line 406 Project area continues as primarily agricultural from east of the Dunnigan Hills to Interstate (I) 5. Orchards are found on the Project alignment between I-5 and the tie-in with Line 172A. In addition, developed land uses, such as rural residential and farm buildings, dot the landscape along the Line 406 alignment, as shown on Figure 4.9-1A.

Agricultural lands, which include lands that are currently plowed, used for row crops or improved pasture, or are currently fallow, make up 56.2 percent of the existing land uses along the Line 406 Project alignment. Of the rest of the Line 406 Project area, 36.3 percent is grazing land, 4.2 percent is orchards, and 3.3 percent is urban. Additional detail on adjacent land uses may be found in Figure 2-3.

Land Uses along Line 407

Line 407 West extends from the western terminus at Lines 406 and 172A in Yolo County to the junction of Riego Road and Powerline Road, approximately 1 mile east of the Sacramento River in Sutter County. West of the Sacramento River, the majority of the route follows existing roads with the exception of approximately 2.5 miles of the route length. From the tie-in points with Lines 406 and 172A, the alignment runs south and then east through agricultural fields until it reaches County Road (CR) 17. The Line 407 West pipeline alignment then follows CR-17 eastward through mixed row crops and orchards, crossing State Route (SR) 113 and small patches of oak woodland until it reaches the Knights Landing Ridge Cut. From there, the Project route heads northeast and follows an existing electric utility corridor for 2 miles. It then turns east across the Yolo Bypass to CR-16 and follows CR-16 east through the Sacramento River Ranch Conservation Bank lands and walnut orchards to the Sacramento River crossing site, near the junction of CR-16 and CR-117. See Figures 4.9-1B and 4.9-1C for land uses along the proposed Project. Additional detail on adjacent land uses may be found in Figure 2-4 and 2-5.



Source: California Resource Agency and PG&E 2008.

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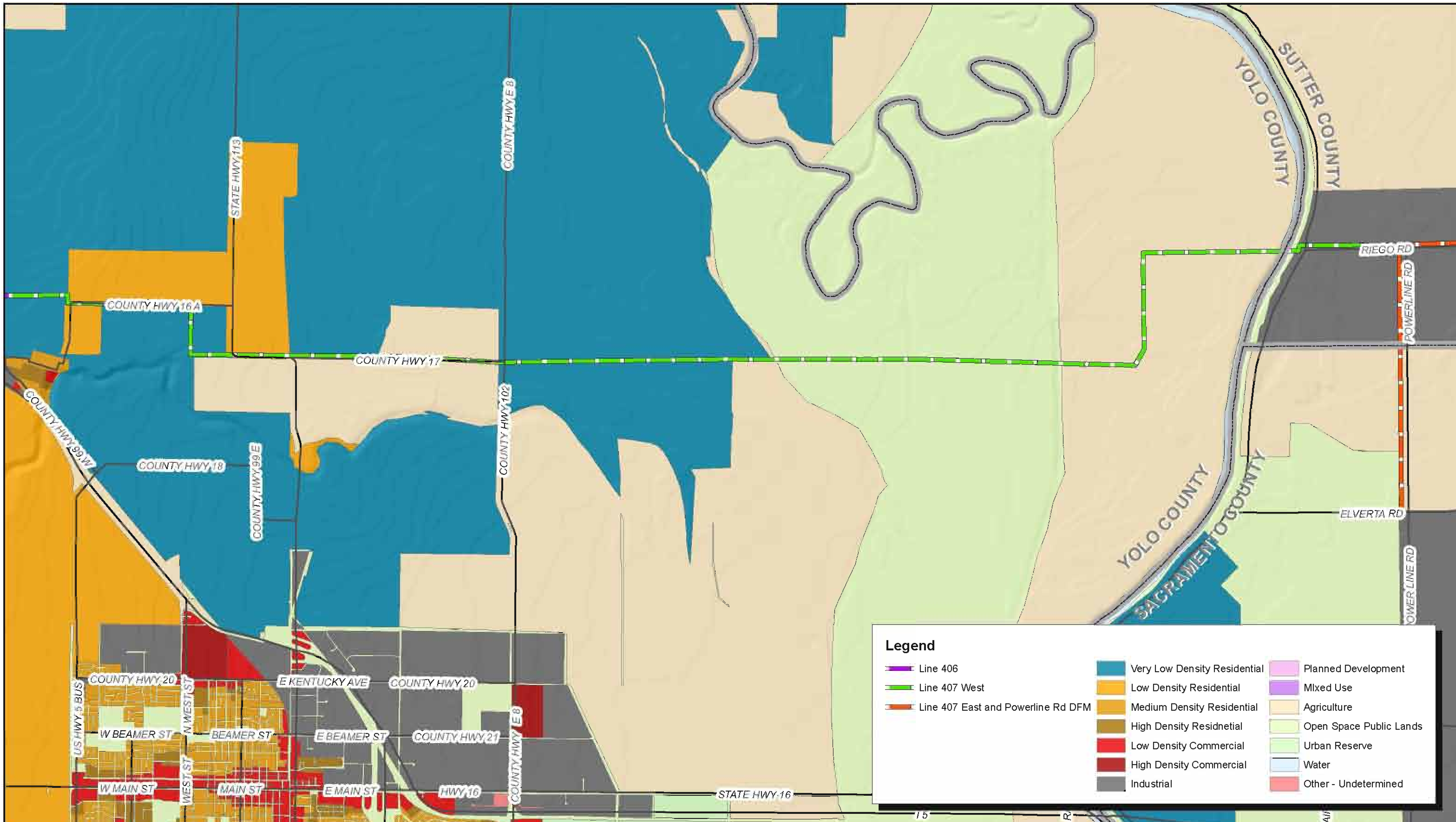
NORTH

4,500 2,250 0 4,500
Feet

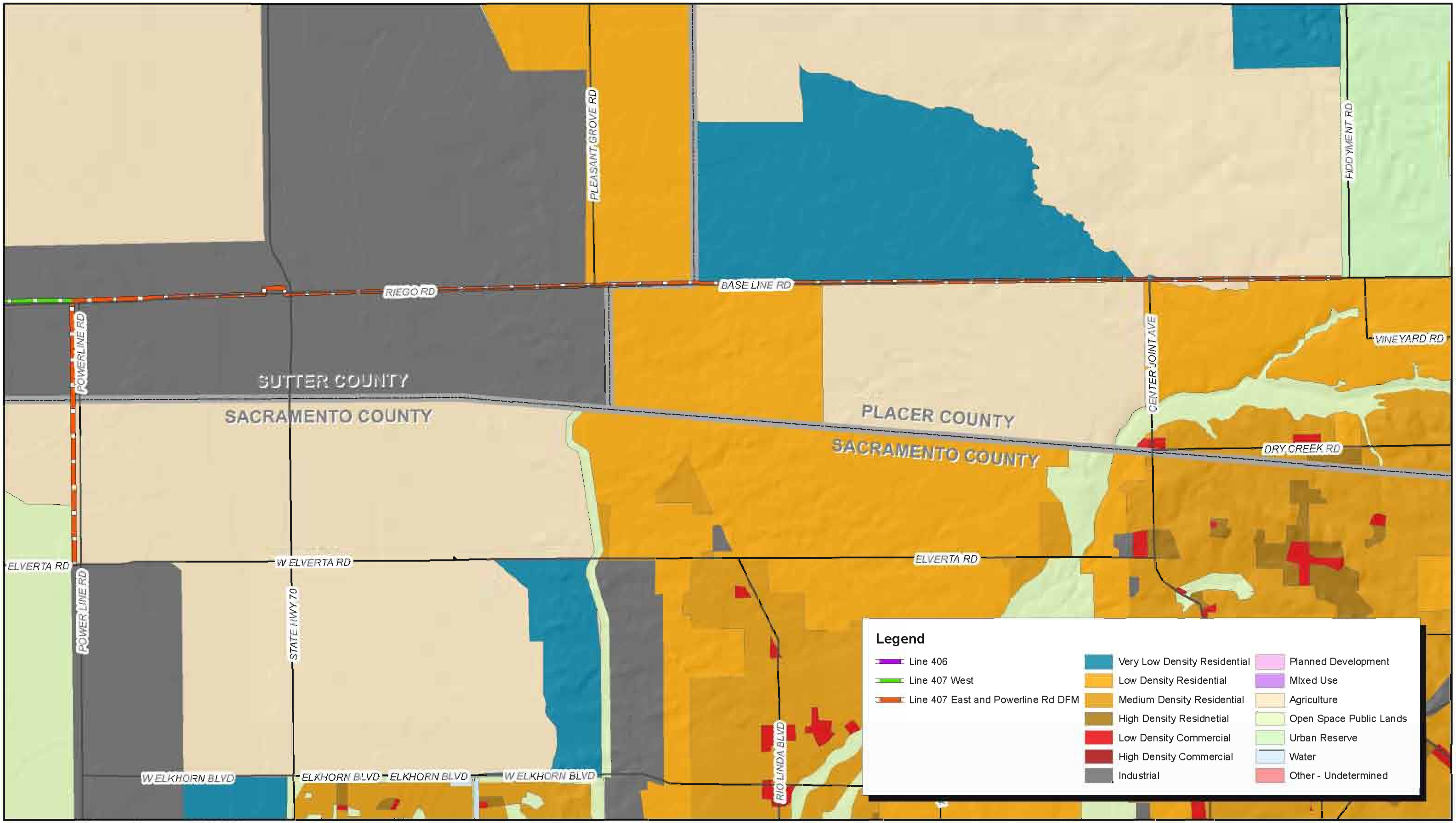
23440005 • 03/2009 | 4.9-1A_project_lu.mxd

Figure 4.9-1A
Land Use in the Project Area



Source: California Resource Agency and PG&E 2008.

Figure 4.9-1B
Land Use in the Project Area



Source: California Resource Agency and PG&E 2008.

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Figure 4.9-1C
Land Use in the Project Area

The Line 407 West Project area consists predominantly of agricultural land use. Row crops, irrigated pasture, orchards, and a few rice fields span a majority of the Project area west of the Sacramento River in the Line 407 West Project area. Orchards are found on the Project alignment between the tie-in points with Lines 406 and 172A and the Sacramento River. The west side of the Sacramento River crossing location is within a walnut orchard. The east side of the river crossing is within a row crop field inside the river levee at the junction of Riego Road and Garden Highway. On the east side of the Sacramento River, the Project alignment follows Riego Road through the Natomas Basin Habitat Conservation Plan (NBHCP) area and past the Huffman East, Huffman West, Vestal, and Atkinson conservation tracts to the junction of Riego Road and Powerline Road.

The eastern end of the Project area is experiencing rapid growth, and new development projects are planned in the vicinity of the Line 407 East and Powerline Road Distribution Feeder Main (DFM) Project areas within Sutter, Sacramento, and Placer counties. Many of the new development projects are in the early planning and construction phases, and the area between the Sacramento River and the Roseville city limits is set for major expansion over the next 10 to 20 years. Residential, commercial, and industrial development will cover much of the Project area where land is currently limited to agricultural use (primarily rice fields and grazing land) and non-native annual grasslands, with some inclusive seasonal pool and vernal pool wetlands, as well as rural residential development.

The Line 407 East alignment follows Baseline Road and Riego Road east of the Sacramento River and terminates at the intersection of Baseline Road and Fiddyment Road. Just east of the NBHCP conservation tracts, the route passes by two major approved development areas, the Sutter Pointe Specific Plan area in Sutter County and the Placer Vineyards Development area in Placer County. The Sutter Pointe Specific Plan area, which will be developed under Sutter County's Measure M, is currently being used for rice fields.

Crossing into Placer County, the Project alignment follows the northern border of the approved Placer Vineyards Development area for approximately 6 miles, just short of the tie-in with Line 123. The area just west of the Sutter/Placer county line near Pleasant Grove Road consists mostly of rural residential and agricultural parcels ranging in size from 1 to 96 acres. Land use in the remainder of the Placer Vineyards Development area, directly south of the Project area, consists of agricultural lands (primarily rice fields). North of the Project alignment, large portions of land are being considered for development (Curry Creek Community Plan), but are currently used for agriculture, and are primarily undeveloped grazing-land. Annual grasslands and vernal pool habitat are also found within this area. There is some low-density residential and commercial use at the intersection of Baseline Road and Fiddyment Road. Recent housing developments have been constructed along the northeastern corner of this intersection, which marks the border of the City of Roseville. The Project alignment also crosses the easement for the Western Area Power Administration’s (WAPA) Olinda-Tracy 500 kV, Obanion-Elverta 230 kV, Cottonwood-Roseville 230 kV, and Roseville-Elverta/Roseville-Fiddyment 230 kV transmission lines. Additional detail on adjacent land uses may be found in Figure 2-5.

The Powerline Road DFM, which will be constructed concurrently with Line 407 East, extends 2.5 miles south from Powerline Road to Elverta Road at the proposed Sacramento Metro Air Park development. This route currently consists primarily of rice fields. Additional detail on adjacent land uses may be found in Figure 2-6.

4.9.2 Regulatory Setting

Federal, State, and local regulations are described in this section. A policy consistency analysis is found in Section 4.9.5, Impact Analysis and Mitigation Measures.

Federal

There are several Federal agencies with jurisdiction over the lands in the ROW for the proposed alignment. The U.S. Department of Transportation (DOT) regulates technical performance of oil and gas pipelines. The standards in the Federal regulations are more stringent for pipelines placed near high human population densities. Federal DOT regulations define area classifications, based on population density of the pipeline vicinity and on an area that extends for 660 feet (220 yards) on either side of the centerline of any continuous one-mile length of the pipeline. Class designations representing more populated areas require higher safety factors in pipeline design, testing, and operation. In addition to population density, other factors are used to determine the design factor used within a class designation. A higher safety factor must be used in the design formula for steel pipelines that: (a) cross, without a casing, the ROW of an unimproved public road; or (b) cross without a casing, or makes a parallel encroachment on the ROW of a hard-surfaced road, a highway, a public street, or a railroad. The design specifications for each of the pipeline area classes included as part of the Project are provided in Section 2.0, Project Description, Table 2-2. Section 2.0, Project Description, Figure 2-7 illustrates the pipeline area classifications along the proposed route.

The U.S. Environmental Protection Agency (EPA) regulates spill responses. The U.S. Army Corps of Engineers (USACE) regulates discharges into waters of the United States.

State

The California Public Utilities Commission (CPUC) has exclusive jurisdiction over the design, location, construction, and operation of gas transmission facilities operated by investor-owned public utilities.

The proposed alignment crosses four counties: Yolo, Sutter, Sacramento, and Placer, and is adjacent to the City of Roseville. Applicable information from land use plans and zoning ordinance for the counties and city are presented below.

Local

Yolo County

The Yolo County General Plan states that all utilities are permitted without obtaining a use permit or site plan approval. The routes of all proposed utility transmission lines are to be submitted to the County for recommendation prior to the acquisition of ROW. No applicable zoning code provisions for a natural gas pipeline were found.

Recreational activities within Yolo County include community parks, State recreation areas and historic parks, lakes, wine tasting, golf, river rafting, boating, and swimming. Yolo County owns and maintains 11 parks and recreation facilities throughout the County, and none are located directly within the Project area. The Esparto Community Park is the closest park to the Project area at approximately 2.5 miles south of Line 406 in the community of Esparto. Recreational activities that may take place in the vicinity of the Project area in Yolo County mainly consist of water sports or leisure activities along Cache Creek and the Sacramento River. Cache Creek lies south of Lines 406 and 407. At the east end of Line 406, the creek is between 1.5 and 3 miles south of the Project. Near Line 407-W, the creek runs within 0.25 mile of some portions of the proposed alignment, most notably near the intersection of SR-113 and CR-17.

A portion of the eastern end of Line 407 West is adjacent to the Gray's Bend area of the Sacramento River. The line then continues east and passes under the

Sacramento River. There are no boat-launching facilities or public beaches on the Yolo County side of the Sacramento River in these areas; however, boats, kayaks, or river rafts launched from other parts of the river may be present at any given time.

The River Ranch Conservation Bank, managed by Wildlands Inc., is a 76-acre mitigation bank west of the Sacramento River and on both sides of CR-16 in Yolo County. It provides permanent habitat for the endangered valley elderberry longhorn beetle (VELB). The bank is within a 3,682-acre property owned by the Sacramento River Ranch LLC. The bank sells conservation credits for the loss of valley elderberry longhorn beetle habitat within the primary service area, which includes all of Sutter, most of Sacramento, and smaller portions of Yolo and Placer counties. Wildlands plans to open two additional portions of the River Ranch valley elderberry longhorn beetle conservation bank, encompassing an additional 95 acres. A portion of Line 407 West runs through the River Ranch Conservation Bank. See Figures 4.9-1A, 4.9-1B, and 4.9-1C for land uses along the proposed Project.

Sutter County

The land use policies in the Sutter County General Plan are implemented through zoning, specific plans, or other planning tools that impose specific development standards on proposed land uses. A review of the Sutter County General Plan did not identify any policies that relate to natural gas pipelines. No applicable zoning provisions for natural gas pipelines were found.

The main recreational activities offered in the Sutter County portion of the Project area are centered around the Sacramento River. Lines 407 West and 407 East cross approximately 6 miles of unincorporated Sutter County. There are no public, community parks or other recreational facilities within 0.5 mile of the Project area. Recreational activities near the Project area are limited to the vicinity of the Sacramento River crossing. The Rio Ramaza Marina is a private marina on an approximate 0.35-mile stretch of the Sacramento River, which is open to public access. This marina offers activities such as fishing, swimming, camping, and boating, and is located approximately 3.4 miles to the south of the proposed alignment crossing/HDD location on the Sacramento River.

<u>The Natomas Basin Habitat Conservation Plan (NBHCP)</u>

The NBHCP covers approximately 53,537 acres of land in northern Sacramento County and southern Sutter County that have historically been utilized for agriculture. The Natomas Basin is bound by Cross Canal on the northwest corner, the Sacramento River on the west side, the American River on the south, and the Natomas East Main Drainage Canal (Steelhead Creek) on the east side.

Segments of Line 407 West and Line 407 East in Sutter County traverse lands covered by the NBHCP, and the Powerline Road DFM in Sacramento County is also on land covered by the NBHCP. Four conservation tracts (Huffman East, Huffman West, Vestal, and Atkinson) exist along Riego Road in the Line 407 West Project area, two on the north side, and two on the south side of the road. In addition, most of the Natomas Basin is currently used for agriculture, and rice fields dominate the Project area within the NBHCP.

The purpose of the NBHCP is to promote biological conservation in conjunction with economic and urban development within the permit areas. The NBHCP establishes a multi-species conservation program to minimize and mitigate expected take of covered species that could result from development, including giant garter snake and Swainson's hawk. The NBHCP requires mitigation for designated types of development within the NBHCP area boundaries, which are in Sacramento and Sutter counties, including public and private utilities. Compliance includes the requirements for land and/or fee dedication as well as the application of measures to avoid, minimize, and mitigate the take of species covered by the NBHCP. See Figures 4.9-1A, 4.9-1B, and 4.9-1C for land uses along the proposed Project.

<u>The Yuba-Sutter Natural Community Conservation Plan (NCCP)/Habitat Conservation Plan (HCP)</u>

The NCCP HCP is in the planning process and the proposed Project is outside of the current plan area boundaries. However, the initial plan area boundary was established during the process of completing the Biological Opinion for the SR-99/SR-70 Upgrade Project in 2003. That process was intended to set the plan area boundary as the area that encompassed SR-99/SR-70 Upgrade Project-related cumulative effects to federally-listed species. The counties, therefore, have been pursuing a conservation plan area boundary that would consider species conservation in a broader context, extend the usefulness of the planning effort and resultant permit streamlining to address both federally and state-listed species, and address the requirements of the California Natural Community Conservation Planning Act as well as the Federal Endangered Species Act. Sutter County staff has recommended that the boundary of the Yuba-Sutter NCCP/HCP be extended to incorporate the area between the eastern boundary of the NBHCP and the Sutter-Placer county line where Line 407 East crosses Pleasant Grove Road.

Sacramento County

A review of the Sacramento County General Plan identified the following policy that relates to natural gas pipelines lines.

> **Policy PF-118:** Route new high-pressure gas mains within railway and electric transmission corridors, and along collector roads, and wherever possible, within existing easements. If not feasible these gas mains shall be placed as close to the easement as possible.

No applicable zoning code provisions for natural gas pipelines were found for Sacramento County.

There are no recreational areas in Sacramento County within 0.5 mile of the Line 407 East Project area. See Figures 4.9-1A, 4.9-1B, and 4.9-1C for land uses along the proposed Project.

Placer County

The Placer County General Plan requires that utilities be designed to minimize visual impact by following the natural terrain and installing them underground. The County also requires that roadway ROW be wide enough to accommodate the travel lanes needed to carry planned utilities. The Placer County Zoning Code (section 17.06.050) indicates that pipelines and transmission lines are an allowable use in all zoning districts without a permit.

Line 407 East extends approximately 6.5 miles into the southwestern corner of Placer County. Doyle Ranch Park is the closest recreational facility to the Project area at approximately 0.85 mile south of Baseline Road. Existing and proposed bikeways are immediately adjacent to the Line 407 East Project area. The City of Roseville has designated Baseline Road and Fiddyment Road as Class II bikeways i.e., on-road bikeways. These roads mark the boundary of the City's western limits and the termination of Line 407 East. Junction Boulevard, approximately 0.3 mile east of the Project, has been proposed as a bikeway by the City of Roseville. See Figures 4.9-1A, 4.9-1B, and 4.9-1C for land uses along the proposed Project.

<u>Placer County Conservation Plan</u>

In 2000, the Placer County Board of Supervisors directed staff to initiate the implementation of the Placer Legacy Program. As part of that direction, staff initiated the preparation of an NCCP and HCP to comply with the State and Federal

Endangered Species Act and the Federal Clean Water Act related to wetlands. That effort, now referred to as the Placer County Conservation Plan, is intended to address the impacts associated primarily with unincorporated growth in western Placer County.

Conservation planning within Placer County is progressing in phases. The first phase is the development of a plan for the western portion of the County. The draft plan (February 2005) specifies techniques for minimizing impacts to wetlands and aquatic ecosystems when constructing utility lines.

City of Roseville General Plan and Sphere of Influence

The eastern terminus of the proposed Project passes through the City of Roseville Sphere of Influence. The Sphere of Influence represents a plan for the probable physical boundary of the City. The City does not control land use activities in this area, but is considered an affected agency for any action to change the municipal service providers to the area. As an affected agency, the City may comment or oppose any changes to service delivery within the area. The City's input would have great weight on the decision of the Local Agency Formation Commission.

4.9.3 Significance Criteria

An adverse impact on land use and planning was considered significant and would require mitigation if Project construction or operation would:

1. Conflict with adopted land use plans, policies or ordinances established by a jurisdiction directly affected by the Project;

2. Result in conflicts with planning efforts to protect the recreational resources of an area;

3. Conflict with or result in incompatible adjacent land uses, including any approved residential or commercial development plans or any applicable habitat conservation plan or natural community conservation plan; or

4. Physically divide a community.

4.9.4 Applicant Proposed Measures

No Applicant Proposed Measures (APMs) have been identified by PG&E that are relevant to this Section.

4.9.5 Impact Analysis and Mitigation

Impact Discussion

Land Use Plans, Policies or Ordinances

Designated Land Uses are displayed in Table 4.9-1, and Figures 4.9-1A, 4.9-1B, and 4.9-1C depict land uses along the proposed Project. Utility lines are not prohibited in any of these land use designations. Sutter County does not have any policies pertaining to locations of natural gas pipelines. Sacramento County's General Plan indicated that gas mains should be located in utility corridors or along collector roads. Placer County's General Plan indicates that gas lines should be installed underground. Yolo County's General Plan indicates that all utilities are permitted without obtaining a use permit or site plan approval. The Project does not conflict with any of these plans. Therefore, impacts would be less than significant (Class III).

Conversion of Agricultural Land or Conflict with Williamson Act Contract

The Project would not create conflict with agricultural policies in Yolo, Placer, Sutter, and Sacramento counties designed to preserve agricultural lands. For a detailed discussion on potential impacts to agricultural resources, refer to Section 4.2, Agricultural Resources.

All Williamson Act lands disturbed by construction activities would be returned to prior status as agreed upon with the landowner with the exception of certain areas where permanent aboveground stations would be constructed in Williamson Act tracts.

The amount of farmland that would be permanently converted to non-agricultural use by the construction of the six stations is 2.55 acres. The project would also result in the permanent conversion of approximately 3.1 acres of existing orchards (because of restrictions related to replanting of trees and other deep-rooted plants) to other agricultural practices. The amount of farmland permanently impacted (2.55 acres) and the amount of farmland converted from deep rooted plants to other types of crops (3.1 acres) does not represent a significant regional loss and would not conflict with the Williamson Act designation. Therefore, impacts would be less than significant (Class III).

Recreational Resources

As discussed in Section 4.11, Recreation, the Project would be constructed within 0.5 mile of Cache Creek, the Sacramento River, Rio Ramaza Marina, and existing Class II bikeways in the City of Roseville. The temporary short-term nature of the HDD crossing of the Sacramento River would not impact river recreation, including the marina. The bike paths would not be affected as the proposed alignment would not extend past the intersection of Baseline Road and Fiddyment Road. Therefore, the Project would not result in conflicts with planning efforts to protect the recreational resources of an area and would be less than significant (Class III).

Divide an Established Community

The proposed Project alignment passes through primarily agricultural or undeveloped lands. The proposed Project would follow the edge of the Sutter Pointe Specific Plan area and the Placer Vineyards Development area, but would not physically divide either of these areas. As a result, the Project would not physically divide a community and would be less than significant (Class III).

Impact LU-1: Conflict with Adjacent Land Uses

The Project would not conflict with development plans for the Sutter Pointe Specific Plan Area, Placer Vineyards Specific Plan, the Sierra Vista Specific Plan, or the Curry Creek Specific Plan, but would cross lands included in the Natomas Basin Conservancy and River Ranch Conservation Bank. The Project could also conflict with operation of Western Area Power Administration (WAPA) power lines (Potentially Significant, Class II).

The proposed Project would cross areas designated as mitigation lands by the Natomas Basin Conservancy (a portion of Line 407-W). These mitigation lands contain foraging habitat for Swainson's hawk that nest along the adjacent Sacramento River. They also contain a drainage canal, which is considered a movement corridor for giant garter snake.

The proposed Project would cross areas included in the River Ranch Conservation Bank (a portion of Line 407-W). The River Ranch Conservation Bank, managed by Wildlands Inc., is a 76-acre mitigation bank west of the Sacramento River and on both sides of CR-16 in Yolo County. It provides permanent habitat for the endangered Valley elderberry longhorn beetle (VELB). The bank is within a 3,682-acre property owned by the Sacramento River Ranch LLC. The bank sells conservation credits for the loss of valley elderberry longhorn beetle habitat within the primary service area, which includes all of Sutter, most of Sacramento, and smaller portions of Yolo and Placer counties. Wildlands plans to open two additional portions of the River Ranch valley elderberry longhorn beetle conservation bank, encompassing an additional 95 acres.

The proposed Project could potentially conflict with operation of portions of the Olinda-Tracy 500 kV, Obanion-Elverta 230 kV, Cottonwood-Roseville 230 kV, and Roseville-Elverta/Roseville-Fiddyment 230kV transmission lines within Placer County.

<u>Mitigation Measures for Impact LU-1: Conflict with Adjacent Land Uses</u>

MM LU-1a. **Mitigation for Impacts to the Natomas Basin Conservancy Mitigation Lands.** Implement MM BIO-4b pertaining to mitigation for impacts to Natomas Basin Conservancy mitigation Lands.

MM LU-1b. **Mitigation for Impacts to the Sacramento River Ranch Conservation Bank Mitigation Lands.** Implement MM BIO-4c pertaining to mitigation for impacts to Sacramento River Ranch Conservation Bank mitigation lands.

MM LU-1c **WAPA License Agreement.** Prior to initiating Project construction, PG&E shall submit Project plans to Western Area Power Administration (WAPA) and obtain approval for a license agreement to conduct work in the area covered by the WAPA easement.

<u>Rationale for Mitigation</u>

Implementation of MM LU-1a (MM BIO-4b) would prevent direct and indirect impacts to Natomas Basin Conservancy mitigation lands. Implementation of MM LU-1b (MM BIO-4c) would prevent direct and indirect impacts to River Ranch Conservation Bank mitigation lands. MM LU-1c would reduce impacts to WAPA power line operations. All impacts would be reduced to less than significant.

Impact LU-2: Result in Safety Risk to Nearby Land Uses

The proposed Project would expose people to an unacceptable risk of existing or potential hazards, including upset and accident conditions involving the

risk for fires, explosions, or the release of natural gas into the environment (Significant, Class I).

For a more detailed discussion of the safety risks to land uses along the proposed pipeline, refer to Section 4.7, Hazards and Hazardous Materials.

High Consequence Areas

The U.S. Department of Transportation provides oversight for the nation's natural gas pipeline transportation system. Its responsibilities are promulgated under Title 49 United States Code (USC) Chapter 601. The Pipeline and Hazardous Materials Safety Administration (PHMSA), Office of Pipeline Safety (OPS), administers the national regulatory program to ensure the safe transportation of gas and other hazardous materials by pipeline.

Areas at risk of pipeline releases are known as High Consequence Areas (HCAs). Federal DOT regulations define area classifications, based on population density of the pipeline vicinity and on an area that extends for 660 feet (220 yards) on either side of the centerline of any continuous one-mile length of the pipeline. The class locations along the proposed pipeline route are shown in Figure 2-7. The four area classifications are defined as follows:

- **Class 1**: A location with ten or fewer buildings intended for human occupancy;
- **Class 2**: A location with more than ten but less that 46 buildings intended for human occupancy;
- **Class 3**: A location with 46 or more buildings intended for human occupancy or where the pipeline lies within 300 feet (100 yards) of any building or small well-defined outside area occupied by 20 or more people during normal use; and
- **Class 4**: A location where buildings with four or more stories aboveground are prevalent.

Natural gas could be released from a leak or rupture. If the natural gas reached a combustible mixture and an ignition source was present, a fire and/or explosion could occur, result in possible injuries and/or deaths. An unacceptable risk is defined as a one in a million (1:1,000,000) chance of a fatality (CDE 2007).

The risks associated with Line 406 were assessed using the existing conditions. The risks associated with Line 407 and the DFM were assessed using existing conditions, plus the impacts of the proposed land developments within Placer County, including Sutter Pointe, Placer Vineyard, Sierra Vista, and Curry Creek.

The anticipated individual frequency of serious injury or fatality from the proposed project is approximately 6.1×10^{-5}. This represents a 1:16,000 likelihood of a serious injury or fatality annually, which is roughly sixty times greater than the generally accepted criteria of 1:1,000,000. The individual risks posed by each of the individual line segments are also summarized. As noted, the risk for each of the individual line segments, except Line DFM, exceeds the individual risk significance criteria.

During operation, the greatest risk for injury and fatality occurs with a leak or unintentional release of natural gas. The most frequent causes of incidents include corrosion and outside forces. Proper design, construction, and maintenance of the pipeline would minimize leaks and corrosion. The pipeline would be buried along its entire length, except at metering stations, regulating stations, and pressure limiting stations, which would be fenced to prevent access. PG&E has increased the cover beyond minimum requirements to 5 feet, which would provide increased protection from third party damage including agricultural operations. PG&E proposes to meet pipeline wall thickness requirements and in some areas of the pipeline go beyond the required thickness for the proposed Project. PG&E also proposes to “butt-weld” all pipeline sections, that is, welded together without the ends overlapping. All welds (100 percent) would be x-rayed to ensure structural integrity and compliance with applicable DOT regulations.

The required regulations along with PG&E Project features that meet and exceed the minimum requirements would reduce risks of project upset. However, additional measures are required to attempt to further reduce the proposed Project impacts.

<u>Mitigation Measures for Impact LU-2: Result in Safety Risk to Nearby Land Uses</u>

MM LU-2a **Mitigation for Safety Risk to Nearby Land Uses.** Implement MM HAZ-2a, Corrosion Mitigation, pertaining to post-construction geometry pig surveys, baseline inspection and internal inspections with a high resolution instrument (smart pig) a minimum of once every 7 years, and development of an Operation and Maintenance Plan and an Emergency Response Plan.

MM LU-2b **Mitigation for Safety Risk to Nearby Land Uses.** Implement MM HAZ-2b, Installation of Automatic Shut-down Valves, pertaining to the installation of automatic shutdown valves in three locations: Power

Line Road MLV Station No. 752+00 (which includes the Riego Road Regulating Station), Baseline Road/Brewer Road MLV Station No. 1107+00, and Baseline Road Pressure Regulating Station No. 1361+00.

Rationale for Mitigation

Corrosion has been found to be one of the main causes of leaks or ruptures. Studies have shown that corrosion occurs more often in older pipes, therefore using pipe manufactured after 2000 would help reduce corrosion. In addition, corrosion can be slowed down by increasing the thickness of the coating on the outside of the pipe increasing the thickness of the pipe, and by increased surveillance through cathodic protection. The corrosion mitigation measure would reduce the incidence of leaks and therefore would reduce the individual risk of serious injury or fatality. Increased wall thickness allows more time to pass before a leak may result.

With the proposed mitigation the incidence of leaks and possible explosion due to outside forces would be reduced, thereby reducing the individual risk of serious injury or fatality. Studies from western Europe have shown that increased wall thickness reduced the frequency of unintentional releases by third parties by 80 percent, increased depth of cover of 48 inches or more reduced third party-caused incidents by 30 percent, and pipelines protected by some form of warning device reduced third party-caused incidents by 10 percent (HSE 2001).

Residual Impacts

The Project design features and the proposed mitigation measures MM LU-2a (MM HAZ-2a) and MM LU-2b (MM HAZ-2b) reduce the risk by 50 percent. However, the individual risk would still be approximately 1:30,000, which exceeds individual risk significance thresholds by a factor of thirty. In addition, the sensitive receptors located within certain distances along the proposed Project alignment would be significantly impacted due to risks of explosion, torch fires, and flash fires. Therefore, impacts remain significant (Class I).

4.9.6 Impacts of Alternatives

A No Project Alternative as well as twelve options have been proposed for the alignment in order to minimize environmental impacts of the proposed Project and to respond to comments from nearby landowners. The twelve options, labeled A through L, have been analyzed in comparison to the portion of the proposed route that has been avoided because of each of the options. Descriptions of the options can be found in Section 3.0, Alternatives and Cumulative Projects, and are depicted in Figure 3-2A through 3-2K. A comparison of impacts is found in Table 4.9-2.

No Project Alternative

Under the No Project Alternative, no natural gas pipeline would be constructed by PG&E in Yolo, Sutter, Sacramento, and Placer counties. There would not be any conflict with adjacent land uses, nor any safety issues to land uses in the area. There would be no land use impacts under the No Project Alternative.

Option A

The area through which the Option A alignment would pass has similar land uses and land use designations as the proposed Project. Land uses are predominantly agricultural. This alignment would avoid segmenting eight orchard fields and removing trees from an orchard at the west end of the proposed alignment. However, trees within orchards near the Sacramento River would still be disturbed. The amount of agricultural land converted to non-agricultural uses (2.55 acres) due to the six aboveground stations would be the same as the proposed alignment with this option. The amount of temporary construction impacts to agricultural fields would be increased with this option due to the increased length (an additional 2,200 feet) along agricultural fields. The amount of agricultural land restricted in the permanent easement to allow only shallow rooted crops to be grown would also be increased with this option.

This option would not reduce impacts to the Natomas Conservancy Mitigation Lands, the River Ranch Conservation Bank, or WAPA lands, since this alignment would not change the portions that pass through these lands.

Significant and unavoidable (Class I) impacts related to safety risks associated with nearby land uses would not be reduced with this alternative. In addition to the HCA areas associated with the proposed Project, this option would impact Durst Organic Growers, a business that has approximately 40 employees year round, and as many as 300 during peak farming periods. By placing the pipeline in close proximity to Durst, a new “high consequence area” or “HCA” would be created along this portion of the pipeline, while the proposed alignment would not result in an HCA in this area.

While significant impacts associated with the proposed Project would not be reduced with this alignment, the impacts related to the number of HCA areas would be increased under Option A.

Option B

The area through which the Option B alignment would pass has similar land uses and land use designations as the proposed Project. Land uses are predominantly agricultural. This alignment would avoid segmenting 13 agricultural fields and removing trees from an orchard at the west end of the proposed alignment. However, trees within orchards near the Sacramento River would still be disturbed. The amount of agricultural land converted to non-agricultural uses (2.55 acres) due to the six aboveground stations would be the same as the proposed alignment with this option. The amount of temporary construction impacts to agricultural fields would be increased with this option due to the increased length (an additional 2,640 feet) along agricultural fields. The amount of agricultural land restricted in the permanent easement to allow only shallow rooted crops to be grown would also be increased with this option.

This option would not reduce impacts to the Natomas Conservancy Mitigation Lands, the River Ranch Conservation Bank, or WAPA lands, since this alignment would not change the portions that pass through these lands.

Significant and unavoidable (Class I) impacts related to safety risks associated with nearby land uses would not be reduced with this alternative. In addition to the HCA areas associated with the proposed Project, this option would impact Durst Organic Growers, a business that has approximately 40 employees year round, and as many as 300 during peak farming periods. By placing the pipeline in close proximity to Durst, a new "high consequence area" or "HCA" would be created along this portion of the pipeline, while the proposed alignment would not result in an HCA in this area.

While significant impacts associated with the proposed Project would not be reduced with this alignment, the impacts related to the number of HCA areas would be increased under Option B.

Option C

The area through which the Option C alignment would pass has similar land uses and land use designations as the proposed Project. Land uses are predominantly agricultural. This alignment would avoid segmenting three agricultural fields and removing trees from an orchard at the west end of the proposed alignment. However, trees within orchards near the Sacramento River would still be disturbed. The amount of agricultural land converted to non-agricultural uses (2.55 acres) due to the six aboveground stations would be the same as the proposed alignment with this option. The amount of temporary construction impacts to agricultural fields, the amount of orchard conversion, and the amount of agricultural land restricted in the permanent easement to allow only shallow rooted crops to be grown, would be similar to the proposed project.

This option would not reduce impacts to the Natomas Conservancy Mitigation Lands, the River Ranch Conservation Bank, or WAPA lands, since this alignment would not change the portions that pass through these lands.

Significant and unavoidable (Class I) impacts related to safety risks associated with nearby land uses would not be reduced with this alternative. Therefore, impacts would remain the same as the proposed Project under Option C.

Option D

The area through which the Option D alignment would pass has similar land uses and land use designations as the proposed Project. Land uses are predominantly agricultural and rural residential.

While Option D would move the pipeline alignment closer to seven residences located along CR 17, it would avoid segmenting ten agricultural fields. The amount of agricultural land converted to non-agricultural uses (2.55 acres) due to the six aboveground stations would be the same as the proposed alignment with this option. The amount of temporary construction impacts to agricultural fields, the amount of orchard conversion, and the amount of agricultural land restricted in the permanent easement to allow only shallow rooted crops to be grown, would be similar to the proposed project.

This option would not reduce impacts to the Natomas Conservancy Mitigation Lands, the River Ranch Conservation Bank, or WAPA lands, since this alignment would not change the portions that pass through these lands.

Significant and unavoidable (Class I) impacts related to safety risks associated with nearby land uses would not be reduced with this alternative. Therefore, impacts would remain the same as the proposed Project under Option D.

Option E

The area through which the Option E alignment would pass has similar land uses and land use designations as the proposed Project. Land uses are predominantly agricultural and rural residential.

While Option E would move the pipeline alignment closer to five residences along CR-19, it would avoid segmenting ten agricultural fields. The amount of agricultural land converted to non-agricultural uses (2.55 acres) due to the six aboveground stations would be the same as the proposed alignment with this option. The amount of temporary construction impacts to agricultural fields, the amount of orchard conversion, and the amount of agricultural land restricted in the permanent easement to allow only shallow rooted crops to be grown, would be similar to the proposed project.

This option would not reduce impacts to the Natomas Conservancy Mitigation Lands, the River Ranch Conservation Bank, or WAPA lands, since this alignment would not change the portions that pass through these lands.

Significant and unavoidable (Class I) impacts related to safety risks associated with nearby land uses would not be reduced with this alternative. Therefore, impacts would remain the same as the proposed Project under Option E.

Option F

Option F would avoid segmenting one agricultural field by placing this short segment of pipeline along the parcel boundary and within close proximity to one additional residence.

The amount of impacts to orchards would be the same as the proposed Project. The amount of agricultural land converted to non-agricultural uses (2.55 acres) due to the six aboveground stations would be the same as the proposed alignment with this option. The amount of temporary construction impacts to agricultural fields, the amount of orchard conversion, and the amount of agricultural land restricted in the permanent easement to allow only shallow rooted crops to be grown, would be similar to the proposed Project.

This option would not reduce impacts to the Natomas Conservancy Mitigation Lands, the River Ranch Conservation Bank, or WAPA lands, since this alignment would not change the portions that pass through these lands.

Significant and unavoidable (Class I) impacts related to safety risks associated with nearby land uses would not be reduced with this alternative. Therefore, impacts would remain the same as the proposed Project under Option F.

Option G

Option G would avoid segmenting one agricultural field by placing this short segment of pipeline along the boundary of the agricultural field near CR-17.

Trees within the orchards at the west end of the alignment and near the Sacramento River would still be disturbed under this option. The amount of agricultural land converted to non-agricultural uses (2.55 acres) due to the six aboveground stations would be the same as the proposed alignment with this option. The amount of temporary construction impacts to agricultural fields, and the amount of agricultural land restricted in the permanent easement to allow only shallow rooted crops to be grown, would be similar to the proposed project.

This option would not reduce impacts to the Natomas Conservancy Mitigation Lands, the River Ranch Conservation Bank, or WAPA lands, since this alignment would not change the portions that pass through these lands.

Significant and unavoidable (Class I) impacts related to safety risks associated with nearby land uses would not be reduced with this alternative. Therefore, impacts would remain the same as the proposed Project under Option G.

Option H

The area through which the Option H alignment would pass has similar land uses and land use designations as the proposed Project. Land uses are predominantly agricultural.

This option would still pass through lands associated with the Yolo Bypass and would impact one additional agricultural field. However, this option would avoid lands within the Sacramento River Ranch Conservation Bank and the Natomas Basin Conservancy.

Trees within the orchards at the west end of the alignment and near the Sacramento River would still be disturbed under this option. The amount of agricultural land converted to non-agricultural uses (2.55 acres) due to the six aboveground stations would be the same as the proposed alignment with this option. The amount of temporary construction impacts to agricultural fields, and the amount of agricultural land restricted in the permanent easement to allow only shallow rooted crops to be grown, would be increased by this option.

Significant and unavoidable (Class I) impacts related to safety risks associated with nearby land uses would not be reduced with this alternative. Therefore, impacts would be the same as for the proposed Project.

Option I

Option I would reroute a portion of Line 407-E to the north to place the pipeline outside of a 1,500-foot safety buffer zone around a planned high school to be located on the south side of Baseline Road.

Instead of placing this segment of the pipeline route along Base Line Road the option would cross three agricultural fields, and cross five wetlands or water bodies. The pipeline would remain near residences along South Brewer Road and Country Acres Lane, but would be located farther away from six residences along Base Line Road.

The amount of agricultural land converted to non-agricultural uses (2.55 acres) due to the six aboveground stations would be the same as the proposed alignment with this option. The amount of impacts to orchards would be the same as the proposed Project; however, the amount of temporary construction impacts to agricultural fields and the amount of agricultural land restricted in the permanent easement to allow only shallow rooted crops to be grown would be increased by this option.

This option would not reduce impacts to the Natomas Conservancy Mitigation Lands, the River Ranch Conservation Bank, or WAPA lands, since this alignment would not change the portions that pass through these lands.

Significant and unavoidable (Class I) impacts related to safety risks associated with nearby land uses would not be reduced to less than significant. Therefore, the impacts would be similar to the proposed Project.

Option J

Option J would reroute a portion of Line 407-E to the north to place the pipeline outside of a 1,500-foot safety buffer zone around a planned high school to be located on the south side of Base Line Road.

Instead of placing this segment of the pipeline route along Base Line Road, the option would be placed near the boundaries of three agricultural fields and would cross five wetlands or water bodies. The pipeline would remain near residences along South Brewer Road and Country Acres Lane, but would be located farther away from six residences along Base Line Road.

The amount of agricultural land converted to non-agricultural uses (2.55 acres) due to the six aboveground stations would be the same as the proposed alignment with this option. The amount of impacts to orchards would be the same as the proposed Project; however, the amount of temporary construction impacts to agricultural fields and the amount of agricultural land restricted in the permanent easement to allow only shallow rooted crops to be grown would be increased by this option.

This option would not reduce impacts to the Natomas Conservancy Mitigation Lands, the River Ranch Conservation Bank, or WAPA lands, since this alignment would not change the portions that pass through these lands.

Significant and unavoidable (Class I) impacts related to safety risks associated with nearby land uses would not be reduced to less than significant. Therefore, impacts would be similar to the proposed Project.

Option K

Option K would reroute a portion of Line 407-E approximately 150 feet to the north to place the pipeline outside of a 1,500-foot safety buffer zone around a planned elementary school to be located south of Base Line Road. Rather than following Base Line road, the pipeline would cross through annual grassland, a vernal pool, and seasonal wetland.

The amount of agricultural land converted to non-agricultural uses (2.55 acres) due to the six aboveground stations would be the same as the proposed alignment with this option. The amount of impacts to orchards, the amount of temporary construction impacts to agricultural fields, and the amount of agricultural land restricted in the permanent easement to allow only shallow rooted crops to be grown would be the same as the proposed Project.

This option would not reduce impacts to the Natomas Conservancy Mitigation Lands, the River Ranch Conservation Bank, or WAPA lands, since this alignment would not change the portions that pass through these lands.

Significant and unavoidable (Class I) impacts related to safety risks associated with nearby land uses would not be reduced to less than significant.

Although this realignment would place the proposed natural gas line outside the 1,500-foot buffer, it is unlikely that serious risks would be posed to the student body from the applicant proposed pipeline location, which is approximately 1,350 feet from the school boundary. Impacts would be the same as for the proposed Project.

Option L

Option L would extend the proposed Line 406-E HDD for approximately 1,000 feet to the east along Base Line Road in order to increase the amount of covered pipeline located within a 1,500-foot safety buffer zone around a planned elementary school that is to be located south of Base Line Road.

The amount of agricultural land converted to non-agricultural uses (2.55 acres) due to the six aboveground stations would be the same as the proposed alignment with this option. The amount of impacts to orchards, the amount of temporary construction impacts to agricultural fields, and the amount of agricultural land restricted in the permanent easement to allow only shallow rooted crops to be grown would be the same as the proposed Project.

This option would not reduce impacts to the Natomas Conservancy Mitigation Lands, the River Ranch Conservation Bank, or WAPA lands, since this alignment would not change the portions that pass through these lands.

Significant and unavoidable (Class I) impacts related to safety risks associated with nearby land uses would not be reduced to less than significant. Option L would involve installing the portion of Line 407, Phase I which is within the 1,500-foot buffer of a planned elementary school, using horizontal directional drilling techniques. This would significantly reduce or eliminate the likelihood of the line being damaged by third parties, since the line would be installed well below normal excavation depths.

Although the risk would decrease under Option L, the impacts would be similar to the proposed Project.

Table 4.9-2: Comparison of Alternatives for Land Use

Alternative	Comparison with Proposed Project
No Project	No Impacts
Option A	Greater Impacts
Option B	Greater Impacts
Option C	Similar Impacts
Option D	Similar Impacts
Option E	Similar Impacts
Option F	Similar Impacts
Option G	Similar Impacts
Option H	Similar Impacts
Option I	Similar Impacts
Option J	Similar Impacts
Option K	Similar Impacts
Option L	Similar Impacts
Source: Michael Brandman Associates 2009.	

4.9.7 Cumulative Projects Impact Analysis

Future projects considered in the cumulative projects impact analysis include those listed in Table 3.2 in Section 3.0, Alternatives and Cumulative Projects.

The proposed Project would conflict with adjacent land uses. The proposed Project alignment would cross the Natomas Conservancy lands and the Sacramento River Ranch Conservation Bank lands that are managed for mitigation. The proposed Project alignment would also overlap with four transmission line projects managed by WAPA in Placer County. These conflicts would be mitigated to a less than significant level.

The proposed Project would not result in cumulative impacts in terms of dividing a community or conflicts with protecting recreational resources. The Sacramento Metro Air Park and the Sutter Pointe Specific Plan and related projects would not result in loss of any recreational resources. The Placer Vineyards project would create new recreational resources, and the Sierra Vista Specific Plan would be implemented in an area where there are not any recreational resources.

When considered with other projects in the area, the proposed Project would not add to cumulative impacts in terms of consistency with applicable plans, policies, and ordinances in jurisdictions affected by the proposed Project. The proposed Project would not require any General Plan amendments to re-designate any of the current land uses described in Table 4.9-1.

However, the safety risks to nearby land uses would be significant and unavoidable. Areas at risk of pipeline releases are known as High Consequence Areas (HCAs). The Project HCA areas are shown on Figure 2-7, and are described in more detail in Section 4.7, Hazards and Hazardous Materials. The required regulations, along with PG&E Project features that meet and exceed the minimum requirements, would reduce risks of project upset, but not to less than significant levels. Development of the specific plan areas along portions of the proposed Project would result in increased exposure of people to an unacceptable risk of existing or potential hazards, including upset and accident conditions involving the risk for fires, explosions, or the release of natural gas into the environment. Therefore, cumulative impacts to land uses with regard to increased safety risks would be significant and unavoidable (Class I).

4.9.8 Summary of Impacts and Mitigation Measures

Table 4.9-3 presents a summary of impacts on land use and planning and the recommended mitigation measures.

Table 4.9-3: Summary of Land Use and Planning Impacts and Mitigation Measures

Impact	Mitigation Measure
LU-1. Conflict with Adjacent Land Uses.	**LU-1a.** Mitigation for impacts to the Natomas Basin Conservancy mitigation lands. **LU-1b.** Mitigation for impacts to the Sacramento River Ranch Conservation Bank mitigation lands. **LU-1c.** WAPA license agreement.
LU-2. Result in Safety Risk to Nearby Land Uses.	**LU-2a.** Mitigation for safety risk to nearby land uses. **LU-2b.** Mitigation for safety risk to nearby land uses.
Source: Michael Brandman Associates 2009.	

4.10 NOISE

Potential noise sources associated with the Project include construction equipment and activities, as well as operational noise associated with pressure limiting regulators, valves, and pressure relief gas discharges. These operational facilities would be located at the proposed metering and pressure limiting/regulating stations. The pipeline itself, as well as most valves, would be underground, and would not create audible noise at nearby receptors.

4.10.1 Environmental Setting

Fundamentals of Environmental Sound and Noise

Sound can be described in terms of amplitude (loudness) and frequency (pitch). The standard unit of sound amplitude measurement is the decibel (dB). The decibel scale is a logarithmic scale that describes the intensity of the pressure vibrations that make up a sound. The pitch of the sound is correlated to the frequency of the sound's pressure vibration. Because humans are not equally sensitive to a given sound level at all frequencies, a special scale has been devised that specifically relates noise to human sensitivity. The A-weighted decibel scale (dBA) does this by placing more importance on frequencies that are more noticeable to the human ear.

Noise is typically defined as unwanted sound. Typically, noise in any environment consists of a base of steady "background" noise made up of many distant and indistinguishable noise sources. Superimposed on this background noise is the sound from individual local sources. These sources can vary from an occasional aircraft or train passing by to virtually continuous noise from traffic on a major highway.

Several rating scales have been developed to analyze the adverse effect of noise on people. Since environmental noise fluctuates over time, these scales consider that the effect of noise upon people is largely dependent upon the volume of the noise, as well as the time of day when the noise occurs. The scales that are applicable to this analysis are as follows:

- The equivalent energy noise level (L_{eq}) is the average acoustic energy content of noise for a stated period of time. Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. For evaluating community impacts, this rating scale does not vary, regardless of whether the noise occurs during the day or the night;

- The Day-Night Average Level (L_{dn}) is a 24-hour average L_{eq} with a 10 dBA "weighting" added to noise between the hours of 10 p.m. to 7 a.m. to account for noise sensitivity in the nighttime;

- The maximum instantaneous noise level experienced during a given period of time is L_{max}; and

- Community Noise Equivalent Level (CNEL) is the average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels to sound levels occurring between 7 a.m. and 10 p.m. and 10 decibels to sound levels between 10 p.m. and 7 a.m.

Noise caused by natural sources and human activities is usually well represented by median noise levels during the day, night, or over a 24-hour period. Environmental noise levels are generally considered low when the L_{eq} is below 60 dBA, moderate in the 60 to 70 dBA range, and high above 70 dBA. Examples of settings with low daytime background noise levels are isolated, natural settings that can provide noise levels as low as 20 dBA and quiet, suburban, residential streets that can provide noise levels around 40 dBA. Noise levels above 45 dBA at night can disrupt sleep. Examples of moderate-level noise settings in urban residential or semi-commercial areas are typically 55 to 60 dBA and in commercial locations are typically 60 dBA. For a continuous or steady source that emits the same noise level over a 24-hour period, the L_{dn} will be 6.4 dB greater than the L_{eq} (i.e., 50 dBA L_{eq} is equivalent to 56 dBA L_{dn}).

Noise levels from a particular source decline as distance from a receptor increases. Other factors, such as the weather and reflecting or shielding, also help intensify or reduce noise levels at any given location. A commonly used rule of thumb for roadway noise is that for every doubling of distance from the source, the noise level is reduced by about 3 dBA at acoustically "hard" locations (i.e., the area between the noise source and the receptor is nearly complete asphalt, concrete, hard-packed soil, or other solid materials) and 4.5 dBA at acoustically "soft" locations (i.e., the area between the source and receptor is normal earth or has vegetation, including grass). Noise from stationary or point sources is reduced by approximately 6 to 7.5 dBA for every doubling of distance at acoustically hard and soft locations, respectively. Noise levels may also be reduced by intervening structures; generally, a single row of buildings between the receptor and the noise source reduces the noise level by about 5 dBA, while a solid wall or berm reduces noise levels by 5 to 10 dBA. The manner in which older homes in California were constructed generally provides a reduction of exterior-to-interior noise levels of about 20 to 25 dBA with closed windows. The exterior-to-interior reduction of newer residential units is generally 30 dBA or more.

Fundamentals of Groundborne Vibration

Vibration is sound radiated through the ground. The rumbling sound caused by the vibration of room surfaces is called groundborne noise. The ground motion caused by vibration is measured in the United States as vibration decibels (VdB).

The background vibration velocity level in residential and educational areas is usually around 50 VdB. Groundborne vibration is normally perceptible to humans at approximately 65 VdB. A vibration velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels for most people.

Most perceptible indoor vibration is caused by sources within buildings, such as the operation of mechanical equipment, movement of people, or the slamming of doors. Typical outdoor sources of perceptible groundborne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the groundborne vibration from traffic is rarely perceptible. The range of interest is from approximately 50 VdB, which is the typical background vibration velocity level, to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings. Construction activities can generate groundborne vibrations that can pose a risk to nearby structures. Constant or transient vibrations can weaken structures, crack facades, and disturb occupants.

Construction vibrations can be transient, random, or continuous. Transient construction vibrations occur from blasting, impact pile driving, and wrecking balls. Continuous vibrations result from vibratory pile drivers, large pumps, and compressors. Random vibration can result from jackhammers, pavement breakers, and heavy construction equipment.

Existing Conditions

The Project runs west to east, primarily across agricultural fields or along sparsely populated county roadways in Yolo, Sacramento, Sutter, and Placer counties.

Scattered rural residential uses exist along the roadways in the vicinity of the Project alignment. Most of the land uses along the proposed pipeline route are agricultural or rural residential, and the nearest roadways are lightly traveled west of SR-99. Ambient noise levels along most of the route are therefore expected to range from the quietest levels measured at County Road (CR) 17 to the levels observed at the Sacramento Metro Air Park (see discussion below under Noise Measurements). Ambient noise levels along the proposed route adjacent to Baseline Road are expected to be in the range of the levels measured near the intersection of Baseline Road and Fiddyment Road.

Yolo County

About ten homes are located within about 100 feet of the pipeline route along Yolo CR-17 between Interstate (I) 505 and I-5.

In Yolo County within the town of Yolo the closest school is an existing school with elementary through high school grades to the south of the Line 407 alignment. The existing Cache Creek High School is at the intersection of Clay Street and 2nd Street and is approximately 0.77 mile south of the pipeline alignment and 0.8 mile southeast of the proposed Yolo Junction Pressure Limiting Station (YJS) along Line 172A.

Another sensitive receptor, the Yolo Branch Library, is in the town of Yolo at the intersection of Sacramento Street and 2nd Street, and is approximately 0.66 mile south of the Project area and 0.72 mile southwest of the proposed Yolo Junction Pressure Limiting Station. Approximately 17 residences in the Yolo vicinity are located in close proximity (150 feet or less) to the Project area. The nearest residence to the YJS is approximately 2,100 feet to the south-southeast.

There are seven proposed horizontal direction drill (HDD) segments in Yolo County and there are three residences that occur within 1,000 feet of an HDD pad (near I-505, I-5, and State Route [SR] 113). The main line bridle valves and blow-off stacks would be installed at the west end of Line 406 where it meets Lines 400 and 401. The nearest residences to these pipeline appurtenances are approximately 1 mile to the northeast and southeast.

Further west of the town of Yolo, two schools are approximately 0.9 mile south of the Line 407 route. The Laugenour School site is on the west side of SR-113 to the north of Cache Creek. The Laugenour School is historic and no longer used, but now houses the Future Farmers of American (FFA) and Agriculture programs of the

Woodland and Pioneer High Schools (not in the Project area). Other schools in Yolo County are more than 1 mile from the Project area.

Sacramento County

The portion of the pipeline located in Sacramento County is limited to approximately 2.5 miles of the Powerline Road DFM. There are no sensitive receptors in the vicinity of the Project in Sacramento County.

Sutter County

There are scattered residences along the portion of the pipeline that traverses Sutter County. Two residences on Riego Road (just past Powerline Road and at the corner of Pacific Avenue) are within 50 feet of the Project construction ROW.

Placer County

In Placer County, the nearest sensitive receptors are two schools. The Alpha School (historical) is approximately 0.5 mile north of Line 407 along Baseline Road, and the Coyote Ridge Elementary School is approximately 0.4 mile north-northeast of the eastern terminus of Line 407 at the intersection of Baseline Road and Fiddyment Road.

The proposed Baseline Road Pressure Regulating Station (BRS) would be located on Baseline Road between Walerga Road and Fiddyment Road, within the City of Roseville's sphere of influence. This site is currently undeveloped, but is adjacent to existing suburban residential development to the east and south. Future development is planned under the Sierra Vista Specific Plan and the nearby Placer Vineyards Specific Plan.

Noise Measurements

Ambient noise measurements were conducted in three locations along the pipeline route. A continuous 24-hour noise measurement was conducted at 32865 Yolo CR-17. Short-term (15-minute) noise samples were collected at two locations: near the proposed Powerline Road Pressure Regulating Station (PRS) / Metro Air Park, and near the proposed BRS. Figures 4.10-1a, 4.10-1b, and 4.10-1c show the locations of the ambient noise measurement sites.

The continuous noise measurement site at 32865 CR-17 was selected to be representative of the quietest rural residential areas that could be impacted by Project-related noise. This site is in the Dunnigan Hills approximately midway between I-5 and I-505, and is shielded from freeway traffic noise by topography. The site is adjacent to CR-17, which experiences very little traffic, as the house at 32865 CR-17 is located at the end of the paved road. Ambient noise sources primarily consist of the wind in trees, insect sounds and bird vocalizations, and occasional traffic. Although no aboveground Project-related equipment would be located near this site, construction would occur immediately in front of the house.

The 24-hour noise measurements were performed August 18 and 19, 2008. The results are summarized in Table 4.10-1, and are portrayed graphically in Appendix I. The noise environment at this location may be described as very quiet, especially during daytime hours. The elevated sound levels at night were apparently caused by birds and insects in the adjacent vegetation. Other homes in rural environments could be exposed to ambient noise levels in this range, though increased proximity to major roadways would result in higher background noise levels (represented by the L_{90} values). In general, the noise environment in the vicinity of the rural residences near the proposed pipeline route and aboveground facilities would be considered to be very quiet.

Table 4.10-1: Measured Noise Levels - 32865 County Road 17, August 18 to 19, 2008

Date	Time	Hourly Sound Level, dB			
		L_{eq}	L_{max}	L_{50}	L_{90}
August 18, 2008	1300	44.1	71.8	36.7	30.6
	1400	49.5	72.1	41.3	34.5
	1500	48.7	69.4	41.9	35.6
	1600	43.5	69.0	36.8	33.3
	1700	46.1	64.9	39.6	34.1
	1800	44.0	59.5	39.4	33.0
	1900	43.2	65.3	39.1	32.2
	2000	52.0	67.1	46.7	42.0
	2100	51.9	65.1	50.3	45.5
	2200	57.6	70.9	55.2	49.2
	2200	54.4	70.8	50.6	39.0
	2300	49.2	67.6	47.1	40.5

Date	Time	Hourly Sound Level, dB			
		L_{eq}	L_{max}	L_{50}	L_{90}
August 19, 2008	0000	52.9	57.1	52.6	47.7
	0100	53.8	57.6	53.9	50.1
	0200	54.1	58.5	53.7	51.1
	0300	52.0	57.3	51.4	48.5
	0400	51.5	56.9	51.5	44.7
	0500	41.1	60.4	36.5	34.3
	0600	37.3	48.1	36.4	34.6
	0700	45.1	65.6	39.1	37.1
	0800	44.3	65.1	37.0	33.3
	0900	46.1	73.5	33.4	29.6
	1000	37.2	57.9	27.6	24.3
	1100	44.2	75.8	27.6	23.9
	1200	44.1	71.8	36.7	30.6
Source: Brown-Buntin Associates, Inc. 2008.					

The proposed PRS / Sacramento Metro Air Park site was selected for ambient noise measurements because the aboveground equipment that would be located in that vicinity could produce audible noise, and because there is the potential for development of moderately sensitive light industrial land uses nearby. The area is currently used for agriculture, and the site is located adjacent to Runway 18L/36R at Sacramento International Airport. Two 15-minute noise measurements were performed on August 7, 2008. The data are summarized in Table 4.10-2. This site is currently affected by local noise sources, and is expected to experience increased ambient traffic noise exposure as the Air Park is developed.

Table 4.10-2: Measured Noise Levels -
Short-Term Sample Sites, August 7, 2008

Location	Time	15-Minute Sound Level, dB			
		L_{eq}	L_{max}	L50	L90
Powerline Road and Elverta Road	15:16:15	59.5	74.10	50.3	42.7
	21:59:40	49.4	60.9	45.6	39.8

Location	Time	15-Minute Sound Level, dB			
		L_{eq}	L_{max}	L50	L90
Baseline Road and Fiddyment Road	16:05:00	49.5	62.2	46.9	43.9
	22:35:41	59.4	76.4	47.2	43.3
Source: Brown-Buntin Associates, Inc. 2008.					

The Baseline Road measurement site was selected to represent ambient noise levels at the existing homes near Baseline Road and Fiddyment Road. It was not possible to gain access to the proposed BRS site, so a representative location was selected on the south side of Baseline Road, south of the proposed BRS. Background noise levels were caused by traffic on both Baseline Road and Fiddyment Road; the highest noise levels were due to loud individual vehicles on Baseline Road. Two 15-minute noise measurements were performed on August 7, 2008. The data are summarized in Table 4.10-2. This site is currently affected by local traffic noise sources, and is expected to experience increased traffic noise exposure as new residential development occurs in the immediate vicinity.

4.10.2 Regulatory Setting

Federal

There are no specific Federal regulations for noise produced by local land use projects. However, the Federal government applies guidelines for acceptable noise levels at residential projects that qualify for federal funding support (such as U.S. Department of Housing & Urban Development Housing [HUD] financed multi-family development projects) that are generally in the range of 55 dB L_{dn} to 65 dB L_{dn}, based upon the recommendations contained in the U.S. EPA “Levels Document” and upon the 65 dB L_{dn} criterion applied by the U.S. Department of Housing and Urban Development and other federal agencies.

Source: Adapted from Brown-Buntin Associates, Inc. 2008.

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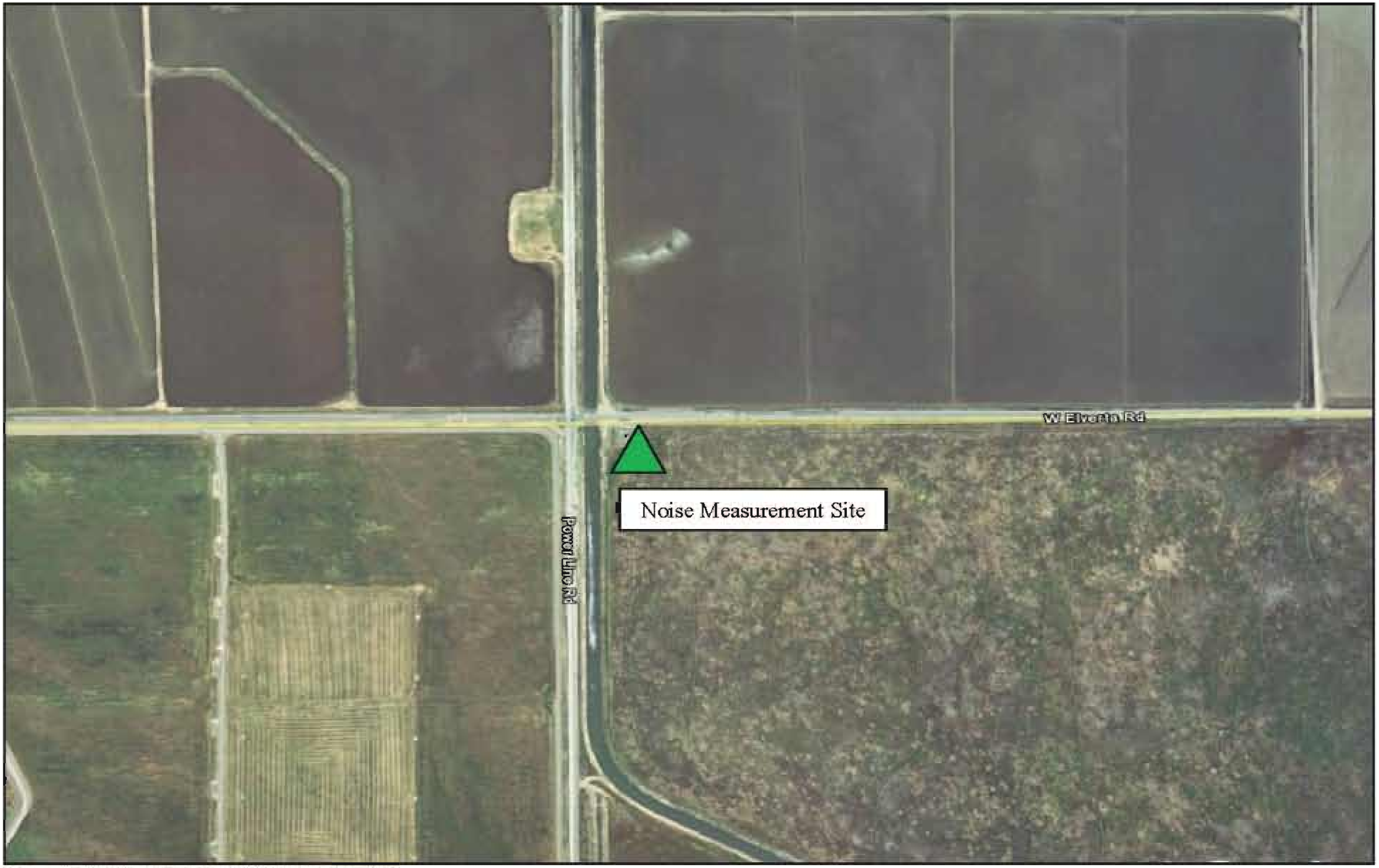
NORTH

NOT TO SCALE

Figure 4.10-1A
24-Hour Noise Measurement
32865 County Road 17, Yolo County



Source: Adapted from Brown-Buntin Associates, Inc. 2008.

Figure 4.10-1B
Short-Term Noise Measurement
Powerline Road and Elverta Road, Sacramento County

NORTH

NOT TO SCALE

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CALIFORNIA STATE LANDS COMMISSION • PG&E LINE 406/407 NATURAL GAS PIPELINE
DRAFT EIR

Source: Adapted from Brown-Buntin Associates, Inc. 2008.

NOT TO SCALE

Michael Brandman Associates

Figure 4.10-1C
Short-Term Noise Measurement
Baseline Road and Fiddyment Road, Placer County

These criteria are typically applied to noise from transportation noise sources, but may be used to assess the compatibility of other noise sources relative to residential land uses, provided that consideration is given to potential disturbances due to impulsive sound, tonal content (whistles, music, etc.), and the prevalence of nighttime activities.

State

There are no specific State regulations for noise produced by local land use projects. The State Office of Planning and Research (OPR) has prepared guidelines for preparation of the Noise Element of the General Plan for cities and counties in California that are similar in concept to the EPA and HUD recommendations, but it is the responsibility of local governments to adopt Noise Element standards that are suited to their individual situations.

Local

The proposed pipeline Project would pass through or be adjacent to five local governmental jurisdictions: Yolo County, Sutter County, Sacramento County, Placer County, and the City of Roseville.

Yolo County General Plan

There are no quantitative noise standards for new projects in the Yolo County General Plan. The Yolo County General Plan is currently being updated and the draft for public comment was released in September 2008. However, the current (1983) General Plan contains the following general policies directed toward ensuring compatible land uses relative to noise:

Policy N 1: Noise, Basic. Yolo County shall regulate, educate, and cooperate to reduce excessive noise levels within the environment and particularly those noise levels that impinge upon the home environment.

Policy N 2: Noise/Land Use. Yolo County shall regulate the location and operation of land uses to avoid or mitigate harmful or nuisance levels of noise.

Policy N 3: Noise, Prevent and Control. Noise shall be prevented, avoided, and suppressed by controlling noises at the source, providing barriers or buffers, by the implementation of a noise ordinance and by means of wise land use planning and implementation.

Policy N 4: Noise Ordinance. Yolo County shall adopt a comprehensive Noise Ordinance.

Policy N 5: Development Review. Yolo County shall review all new development and redevelopment in terms of the Standards of Noise Avoidance or Control.

Policy N 6: Basic Compatibility. Yolo County will review all new developments, public and private, for noise compatibility with surrounding uses to protect the occupants of nearby lands from undesirable noise levels and shall discourage new residential development in areas subject to legal, long term, excessive noise.

Policy N 7: Development Control/Noise. Yolo County shall review development plans for noise compatibility of the proposed use with the surrounding uses and planned uses, and shall incorporate noise reduction, avoidance, or mitigation techniques as necessary. In addition to other ordinances, standards, or devices, the following may be used to accomplish these policies:

- Provide open space, berms or walls, or landscaped areas between occupied dwellings and noise generators.
- Require specific plans, subdivision maps, or zoning standards to require deep lots in order to locate dwellings farthest from noise generators.
- Require effective sound barriers for new residential developments adjacent to existing freeways and highways.

The Yolo County Code does not have any standards directly related to construction or operational noise.

Sutter County General Plan

According to the Sutter County General Plan, there are very few existing noise conflicts in unincorporated Sutter County and most of these are from mobile sources (e.g., motor vehicles, aircraft, and trains). The general plan establishes land use compatibility guidelines for noise-sensitive uses for operational noises from non-transportation sources (see Table 4.10-3). There are no noise-specific municipal codes for construction noise in Sutter County. Table 4.10-4 provides land-use compatibility guidelines for various land uses for new noise-sensitive developments and provides an indication of acceptable noise levels related to operational noise for different land uses.

Table 4.10-3: On-Site Sound-Level Standards for Sensitive Receptors - Sutter County

Sound-level Descriptor	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)
Hourly equivalent energy noise level	50	45
Maximum level, decibels	70	65
Source: Sutter County General Plan 1996.		

Table 4.10-4: Land Use Compatibility Noise-Level Guidelines for Development - Sutter County

Land Use Category[1]		Community Noise Exposure L_{dn}/CNEL, dB[2]						
		55	60	65	70	75	80	
Residential, theaters, meeting halls, churches, auditoriums	A							
	CA							
	U							
Transient lodging, motels, hotels	A							
	CA							
	U							
Schools, libraries, hospitals, child care, museums	A							
	CA							
	U							
Playgrounds, neighborhood parks, Amphitheaters	A							
	CA							
	U							
Office buildings, business, commercial, and professional	A							
	CA							
	U							

		Community Noise Exposure L_{dn}/CNEL, dB[2]						
Industrial, utilities, manufacturing, agriculture	A							
	CA							
	U							
Golf courses, riding stables, outdoor spectator sports	A							
	CA							
	U							

Notes:
1 A=Acceptable; CA=Conditionally Acceptable; U=Unacceptable
2 L_{dn}=Day-Night Average Level; CNEL=Community Noise Equivalent Level; dB=Decibel
Source: Sutter County General Plan 1996.

Sacramento County General Plan

Policies NO-1 and NO-2 of the Sacramento County General Plan Noise Element govern the amount of noise a new project can generate, as measured at existing and proposed noise-sensitive land uses. The Noise Element policies of Sacramento County are consistent with the County Noise Control Ordinance (Sacramento County Code, Chapter 6.68). Therefore, satisfaction of the Noise Element policies would also ensure satisfaction of the County Noise Control Ordinance standards.

Policies NO-1 and NO-2 of the County Noise Element are listed below. Policy NO-1 would pertain to any Project-related traffic noise, while Policy NO-2 would apply to on-site activities.

Policy NO-1. Noise created by new transportation noise sources should be mitigated so as not to exceed 60 dB L_{dn}/CNEL at the outdoor activity areas of any affected residential lands or land use situated in the unincorporated areas. When a practical application of the best available noise-reduction technology cannot achieve the 60 dB L_{dn}/CNEL standard, then an exterior noise level of 65 dB L_{dn}/CNEL may be allowed in outdoor activity areas.

For the purposes of the Noise Element, transportation noise sources are defined as traffic on public roadways and railroad line operations. Control of noise from these sources is preempted by Federal and State regulations. Other noise sources are presumed to be subject to local regulations, such as the Sacramento County Noise

Control Ordinance. Areas affected by public use airport noise are subject to the Airport Land Use section and individual Comprehensive Land Use Policy.

The Noise Element further indicates that a community noise environment of up to 70 dB L_{dn} is acceptable for agricultural lands.

Policy NO-2. Noise created by new non-transportation noise sources shall be mitigated so as not to exceed any of the noise level standards of Table 4.10-5, as measured immediately within the property line of any affected residentially designated lands or residential land use situated in the unincorporated areas.

Table 4.10-5: Noise Level Performance Standards for Residential Uses Affected by Non-Transportation - Sacramento County

Statistical Descriptor	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)
L_{50}	50 dBA	45 dBA
L_{max}	70 dBA	65 dBA

Notes:
These standards are for planning purposes only and may vary from the standards of the County Noise Ordinance which are for enforcement purposes.
These standards apply to new or existing residential areas affected by new or existing non-transportation sources.
Source: Sacramento County General Plan 1993.

Placer County General Plan

The Noise Element of the Placer County General Plan includes the following standards (Table 4.10-6) that are applicable to operational noise associated with new projects.

The Placer County Municipal Code (Chapter 9 Public Peace, Safety, and Welfare) includes an article that pertains to noise (Article 9.36). In this article, sensitive noise receptors are defined as “land uses in which there is a reasonable degree of sensitivity to noise. Such uses include single-family and multi-family residential uses, frequently used outbuildings, schools, hospitals, churches, rest homes, cemeteries, public libraries, and other sensitive uses as determined by the enforcement officer.” The sound level standards for operational noise for sensitive receptors are summarized in Table 4.10-7.

Noise from construction activities is considered exempt from Article 9.36 provided the noise occurs between the hours of 6 a.m. and 8 p.m. Monday though Friday and between the hours of 8 a.m. and 8 p.m. on Saturday and Sunday. For this exemption to be valid, all construction equipment must be fitted with a factory-installed muffling device and maintained in good working order.

Table 4.10-6: Allowable L_{dn} Noise Levels within Specified Zone District[1] - Placer County

Zone District of Receptor	Property Line of Receiving Use	Interior Spaces[2]
Residential Adjacent to Industrial[3]	60	45
Other Residential[4]	50	45
Office/Professional	70	45
Transient Lodging	65	45
Neighborhood Commercial	70	45
General Commercial	70	45
Heavy Commercial	75	45
Limited Industrial	75	45
Highway Service	75	45
Shopping Center	70	45
Industrial	—	45
Industrial Park	75	45
Industrial Reserve	—	—
Airport	—	45
Unclassified	—	—
Farm	(see footnote 5)	—
Agricultural Exclusive	(see footnote 5)	—
Forestry	—	—
Timberland Reserve	—	—
Recreation and Forestry	70	—
Open Space	—	—
Mineral Reserve	—	—

Notes:
1. Overriding policy on interpretation of allowable noise levels: Industries operating upon industrial zoned properties must be afforded reasonable opportunity to exercise the rights/privileges conferred upon them by their zoning. Whenever the allowable noise levels herein fall subject to interpretation relative to industrial activities, the benefit of a doubt shall be afforded to the industrial use.

Zone District of Receptor	Property Line of Receiving Use	Interior Spaces[2]
2. Interior spaces are defined as any locations where some degree of noise-sensitivity exists. Examples include all habitable rooms of residences, and areas where communication and speech intelligibility are essential, such as classrooms and offices. 3. In recognition of the fact that noise mitigation from industrial operations may be difficult or costly, the exterior noise standards for residential zone districts immediately adjacent to industry-related zone districts have been increased by 10 decibels as compared to residential districts adjacent to other land uses. 4. Where a residential zone district is located within an -SP combining district, the exterior noise-level standards are applied at the outer boundary of the -SP district. If an existing industrial operation within an -0SP district is expanded or modified, the noise-levels standards at the outer boundary of the -SP district may be increased. 5. Normally, agricultural uses are noise insensitive and will be treated this way. However, conflicts with agricultural noise emissions can occur where single-family residences exist within agricultural zone districts. Therefore, where effects of agricultural noise upon residences located in these agricultural zones are a concern, a Day-Night Average Level of 70 A-weighted decibels will be considered acceptable outdoor exposure at a residence. Source: Buntin Associates June 2002, Placer County General Plan 1994.		

Table 4.10-7: On-Site Sound Level Standards for Sensitive Receptors - Placer County

Sound-Level Descriptor	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)
Hourly Equivalent Energy Noise Level	55	45
Maximum Level, decibels	70	65
Source: Placer County General Plan 1994.		

The Placer County Municipal Code prohibits any person at any location from creating sound, or allowing the creation of any sound, on property owned, leased, occupied, or otherwise controlled by such person that:

- Causes the exterior sound level when measured on the property line of any affected sensitive receptor to exceed the ambient sound level by 5 dBA; or
- Exceeds the sound-level standards as set forth in Table 4.10-7, whichever is greater.

Placer County allows exceptions for the provisions of this article and the notice of that request for exception must be given to all the properties that would be affected by the exception. Factors considered for construction-related exceptions include but are not limited to the following:

- Conformance with the intent of Article 9.36;
- Uses of the property and existence of sensitive receptors within the area affected by sound;
- Factors related to initiating and completing all remedial work;
- The time of the day or night the exception will occur;
- The duration of the exception; and
- The general public interest, welfare, and safety.

City of Roseville General Plan

The Noise Element of the City of Roseville General Plan establishes an exterior noise level standard of 60 dB L_{dn} (or CNEL) at the outdoor activity areas of new residential uses affected by transportation noise sources. An exterior noise level of up to 65 dB L_{dn} is considered to be Conditionally Acceptable, and may be allowed only after a detailed acoustical analysis is performed and needed noise abatement features are included in the design. The outdoor activity areas for residential developments are considered to be the back yard patios or decks of single-family dwellings. For multi-family residential units, the outdoor activity area is the common area where people generally congregate. The Noise Element also establishes an interior noise level standard of 45 dB L_{dn} for residential uses. Table 4.10-8 below from the City of Roseville Noise Element contains performance standards for non-transportation noise sources.

Table 4.10-8: Performance Standards for Non-transportation Noise Sources or Projects Affected by Non-Transportation Noise Sources - City of Roseville

Noise-Level Descriptor	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)
Hourly L_{eq}, dB	50	45
Maximum Level, dB	70	65

Notes:
Performance standards are measured at the property line of noise-sensitive uses.
Each of the noise levels specified above should be lowered by five dB for simple tone noises, noises generally consisting primarily of speech or music, or for recurring impulsive noises. Such noises are generally considered by residents to be particularly annoying and are a primary source of noise complaints.
These noise level standards do not apply to residential units established in conjunction with industrial or commercial uses (e.g., caretaker dwelling).
No standards have been included for interior noise levels. Standard construction practices should, with exterior noise levels identified, result in acceptable interior noise levels.
Source: City of Roseville General Plan 2004.

Chapter 9.24 of the Roseville Municipal Code is the City's noise ordinance. Section 9.24.030 of the Code provides an exemption from the City Noise Ordinance for: "G. Private construction (e.g., construction, alteration or repair activities) between the hours of 7:00 a.m. and 7:00 p.m. Monday through Friday, and between the hours of 8:00 a.m. and 8:00 p.m. Saturday and Sunday; provided, however, that all construction equipment shall be fitted with factory installed muffling devices and that all construction equipment shall be maintained in good working order."

Vibration Level Criteria

The vibration assessment methodology and criteria used for this Project were derived in part from Federal Transit Administration (FTA) recommendations. The FTA criteria for ground-borne vibration are expressed in terms of the "vibration velocity level," in VdB, with a reference velocity of 10-6 in/sec.

The threshold of vibration perception is taken by the FTA to be 65 VdB, and the threshold of potential architectural damage to fragile structures is about 100 VdB. For residential uses, vibration levels less than 72 VdB are considered acceptable for exposures to more than 70 vibration events per day, and vibration levels less than 80 VdB are considered acceptable for exposures to fewer than 30 vibration events per day.

The State of California Department of Transportation (Caltrans) has prepared guidelines for acceptable vibration limits in terms of the induced peak particle velocity (PPV). Tables 4.10-9 and 4.10-10 show the guidelines from the Caltrans Transportation- and Construction-induced Vibration Guidance Manual:

Table 4.10-9: Guideline Vibration Damage Potential Threshold Criteria

Structure and Condition	Maximum PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely fragile historic buildings, ruins, ancient monuments	-.12	0.08
Fragile Buildings	0.20	0.10
Historic and Some Old Buildings	0.50	0.25
Older Residential Structures	0.50	0.30
New Residential Structures	1.00	0.50
Modern Industrial/Commercial Building	2.00	0.50

Structure and Condition	Maximum PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources

Notes:
Transient sources create a single isolated vibration event, such as blasting or drop balls.
Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.
Source: Jones & Stokes, 2004. Transportation and Construction-Induced Vibration Guidance Manual. June. (J&S 02-039.) Sacramento, CA. Prepared for California Department of Transportation, Noise, Vibration, and Hazardous Waste Management Office, Sacramento, CA.

Table 4.10-10: Guideline Vibration Annoyance Potential Criteria

Human Response	Maximum PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Barely Perceptible	0.04	0.01
Distinctly Perceptible	0.25	0.04
Strongly Perceptible	0.90	0.10
Severe	2.00	0.40

Notes:
Transient sources create a single isolated vibration event, such as blasting or drop balls.
Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.
Source: Jones & Stokes. 2004. Transportation and Construction-Induced Vibration Guidance Manual. June. (J&S 02-039.) Sacramento, CA. Prepared for California Department of Transportation, Noise, Vibration, and Hazardous Waste Management Office, Sacramento, CA.

<u>Measures of Changes in Ambient Noise Levels</u>

For non-transportation noise sources affecting noise sensitive land uses, many jurisdictions consider an increase in ambient noise levels of 5 dB to be potentially significant. This amount of change in environmental noise levels is generally considered to be the minimum required to be clearly noticeable by most people. This measure may be applied to median or energy-average ambient noise levels, whichever is a better measure of potential annoyance in the noise environment.

Some additional guidance as to the significance of changes in ambient noise levels is provided by the 1992 findings of the Federal Interagency Committee on Noise (FICON), which assessed the annoyance effects of changes in ambient noise levels resulting from aircraft operations. The FICON findings are based upon studies that relate aircraft and traffic noise levels to the percentage of persons highly annoyed by the noise. Annoyance is a summary measure of the general adverse reaction of people to noise that generates speech interference, sleep disturbance, or interference with the desire for a tranquil environment.

The rationale for the FICON findings is that it is possible to consistently describe the annoyance of people exposed to transportation noise in terms of L_{dn} or CNEL. The changes in noise exposure that are shown in Table 4.10-11 are expected to result in equal changes in annoyance at sensitive land uses.

Table 4.10-11: Potentially Significant Increases in Cumulative Noise Exposure for Transportation Noise Sources

Ambient Noise Level Without Project (L_{dn} or CNEL)	Maximum PPV (in/sec)
	Change in Ambient Noise Level Due to Project
<60 dB	+5.0 dB or more
60-65 dB	+3.0 dB or more
>65 dB	+1.5 dB or more
Source: Federal Interagency Committee on Noise (FICON 1992), as applied by Brown-Buntin Associates Inc.	

4.10.3 Significance Criteria

A noise impact is considered significant and would require mitigation if:

1. Noise levels from Project construction exceed criteria defined in a construction noise ordinance or general plan of the local jurisdiction in which the activity occurs;
2. Noise levels from Project operations exceed criteria defined in a noise ordinance or general plan of the local jurisdiction in which the activity occurs;
3. Noise levels from Project operations result in a substantial permanent increase in noise levels;
4. Groundborne vibrations or groundborne noise from Project activities would have substantial direct or indirect effects on persons or structures; or
5. For a Project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport,

expose people residing or working in the Project area to excessive noise levels. For a Project within the vicinity of a private airstrip, expose people residing or working in the project area to excessive noise levels.

4.10.4 Applicant Proposed Measures

Applicant Proposed Measures (APMs) have been identified by PG&E in its Environmental Analysis prepared for the CSLC. APMs that are relevant to this Section are presented below. This impact analysis assumes that all APMs would be implemented as defined below. Additional mitigation measures are recommended in this Section if it is determined that APMs do not fully mitigate the impacts for which they are presented.

APM NOI-1. PG&E will limit construction activities to daytime hours whenever possible and will apply noise control best management practices to minimize adverse noise impacts to nearby residences or other sensitive receptor land uses. These provisions would be applicable to construction activities in the vicinity of residences, as no other noise-sensitive uses have been identified along the proposed pipeline route.

APM NOI-2. PG&E will coordinate drilling activities where residents may live within 1,000 feet of the HDD temporary-use areas if construction is scheduled to occur between 8 p.m. and 6 a.m.

4.10.5 Impact Analysis and Mitigation

Impact Discussion

Permanent Noise Level Increase

The Project would install approximately 40 miles of underground 30-inch-diameter natural gas transmission pipeline in Yolo, Sutter, Sacramento, and Placer counties.

Movement of the natural gas through the pipeline would not create any noticeable groundborne vibration or noise. Consequently, no groundborne vibration or groundborne noise from Project operation would affect nearby sensitive receptors.

However, permanent noise from the Project would result from the construction of six aboveground facilities described below:

- The Capay Metering Station (CMS) would be constructed at the connection of Lines 400 and 401 and Line 406, and would consist of just under 1 acre and have sides measuring approximately 134 feet, 142 feet, 209 feet, and 285 feet in length. The CMS would be no greater than 10 feet in height. Access would be provided from an existing dirt road that connects with CR-85 to the east. The Capay Station, depicted on Figure 2-3, would be fitted with an aboveground spool and blind flange to accept a portable pig launcher.

- The Yolo Junction Pressure Limiting Station (YJS) would be constructed at the connection of Line 406 and Line 172A near I-5, and would cover an area of approximately 100 feet by 127 feet (12,700 square feet or 0.29 acres). The YJS would be no greater than 5 feet in height. As shown on Figure 2-3, access would be provided by an unnamed farm road from CR-97 on the west;

- The Powerline Road Main Line Valve (PRV) would be constructed at the connection of Line 407 and the 10-inch DFM and would be installed within a yard measuring approximately 100 feet by 100 feet (10,000 square feet or 0.23 acres) at the intersection of Riego Road and Powerline Road. The PRV would also house the Riego Road Regulating Station (RRS), which would regulate gas pressure from Line 407 into the DFM, and would be no greater than 10 feet in height. The facility would include a main line valve, blowdown facilities, pressure regulating equipment, pressure transmitters, gas flow meter, SCACD/telecom equipments, and cathodic protection equipment. As shown in Figures 2-4, 2-5, and 2-6, access would be provided from an existing dirt road that connects with Riego Road to the south;

- The Powerline Road Pressure Regulating Station (PRS) would be constructed at the southern terminus of the DFM at the southeastern corner of Powerline Road and West Elverta Road. The PRS would regulate gas from the DFM into the local 60-psig distribution system. It would be constructed in an area measuring approximately 40 feet by 102 feet (4,080 square feet or 0.09 acres), would be no greater than 10 feet in height, and would include pressure regulating equipment, gas filtration equipment, and SCADA/telecom equipment. As shown in Figure 2-6, access would be provided directly from West Elverta Road;

- The Baseline/Brewer Road Main Line Valve Station (MLV) would be constructed approximately 250 feet west of Brewer Road along baseline Road. The main line valve is a manually-operated 24 inch ball valve with a high head extension. The MLV would require a permanent easement are of approximately 50 feet by

50 feet (2,500 square feet or 0.06 acres). The MLV would be fenced and include two 10 inch blow-off valves located on each side of the MLV; and

- The Baseline Road Pressure Regulating Station (BRS) would be constructed at the connection of Line 407 and Line 123 on the north side of Baseline Road near Walerga Road/Fiddyment Road. The BRS structure would be no greater than 10 feet in height and would require a permanent easement area of approximately 84 feet by 145 feet (12,180 square feet or 0.28 acres). It would regulate gas from Line 407 into Line 123 and would include a main line valve, blowdown facilities, pressure regulating equipment, pressure transmitters, gas flow meter, SCACD/telecom equipments, and cathodic protection equipment. The BRS would be fitted with an aboveground spool and blind flange to accept a portable pig receiver. Access would be provided directly from Baseline Road (Figure 2-5).

There are no existing sensitive receptors located close to the proposed CMS, PRV or PRS. It does not appear that any noise sensitive development would occur in the vicinity of the proposed CMS, which is surrounded by agricultural land uses. In the vicinity of the proposed PRV and PRS facilities, it is expected that future development would introduce industrial land uses, which would generate noise due to industrial activities and traffic.

There is an existing residence within 1,000 feet of the proposed YJS. Single family homes are adjacent to the proposed MLV site, and it is likely that the lands immediately adjacent to that site will ultimately be developed with residential uses.

The MLV would be located relatively close to existing residences on South Brewer Road north of Baseline Road. Field investigations revealed that the nearest residence, about 160 feet from Baseline Road in the northeast quadrant of the intersection, is burned out and abandoned. Another residence is located about 500 feet north of Baseline Road.

The BRS would be located about 750 feet from existing residences at the northeast, southeast and southwest quadrants of the intersection of Baseline and Fiddyment/Walerga Roads. Residents in the northeast quadrant of the intersection are located within Roseville’s city limits. Residents in the southeast and southwest quadrants are located in Placer County.

Aboveground facilities are designed to have the control valves and piping buried underground. To characterize the noise levels associated with the proposed stations, noise measurements and visual observations were performed on the morning of July 14, 2008, at a similar facility in San Joaquin County, the PG&E Bixler Road PLS. At that location, several valve assemblies and low-pressure gas discharge openings were present aboveground. A control building was also located on the site, and it was equipped with an air conditioning unit.

During the observation period of about one hour, the only audible noise source was the air conditioning unit on the control building, which produced 60 dBA at a distance of 10 feet. The air conditioning unit operated intermittently as a function of the interior air temperature. There was no noticeable noise associated with the aboveground valves. It was reported by PG&E staff that the valves operate quickly and intermittently to route gas to different pipelines, and that their operation is very quiet. The gas discharge openings did not appear to be significant noise sources.

Noise levels from these stations would not result in a substantial permanent increase in noise levels. Based upon the observations at the existing Bixler Road Pressure Limiting Station, it was concluded that the only potentially significant noise source was the air conditioning unit associated with the control building. This noise source would produce a sound level of 45 dBA at a distance of about 56 feet. Both the MLV and the BRS would be located at distances significantly greater than 56 feet from the nearest residences, so the predicted noise levels would not be expected to exceed the 45 dBA Leq noise standards for Placer County or the adjacent City of Roseville.

Based upon the observed ambient noise levels in the vicinity of the proposed Baseline PLS, noise produced by the other facilities is not expected to exceed ambient noise levels at existing noise sensitive receptors.

Noise levels from Project operations would not exceed any criteria defined in a noise ordinance or general plan of the local jurisdictions in which the activities would occur, and noise levels from Project operations would not result in a substantial permanent increase in noise levels. Impacts would be less than significant (Class III).

Airport or Private Airstrip Noise

The Project is within 2 miles of a public airport or public use airport, but is not located within an airport land use plan and would not expose people residing or working in the Project area to excessive noise levels. The only public airport or airstrips in the vicinity of the Project are the Sacramento International Airport and Freedom Field. The Sacramento International Airport is the major transportation airport in the Sacramento metropolitan area that has numerous aircraft landings and takeoffs each day. The southern terminus of the 10-inch-diameter north-south pipeline spur along Powerline Road is approximately 1.49 miles from the nearest terminal buildings, so passengers and airport staff would not be affected by noise during construction activities. Project-related construction workers could be exposed to aircraft noise levels similar to those shown by Figure 4.8-5 when working near the pipeline spur and the Powerline Road Main Line Valve (PRV), with maximum noise levels approaching 75 dBA. This exposure would not be expected to be excessive and would occur only temporarily. Consequently, this would be a less than significant impact. By comparison, Freedom Field, located in the northeast quadrant of Locust Road and Baseline Road, is a private facility that only accommodates sportplanes and ultralights. The Project does not create alternate land uses that would modify the long-term noise conditions for people who live or work in the vicinity of the airport or airstrip and are regularly exposed to airplane noise. Construction workers would conceivably be exposed to noise from airplanes for short periods of time during construction when construction occurs close to the airport runway approaches (especially near the Sacramento International Airport along the western end of Riego Road and along Powerline Road). This exposure would not be expected to be excessive and would occur only temporarily. Consequently, this would be a less than significant impact (Class III).

Impact NOI-1: Project Construction

Noise levels from Project construction would exceed criteria defined in a construction noise ordinance or general plan of the local jurisdiction in which the activity occurs (Potentially Significant, Class II).

The Project would install approximately 40 miles of underground 30-inch-diameter natural gas transmission pipeline in Yolo, Sutter, Sacramento, and Placer counties.

Noise would be generated during the construction of the Project. At any given location, construction noise would be generated over a relatively short period, and would not create a permanent addition to background noise levels. Sensitive noise receptors in the vicinity of the Project alignment may be affected by temporary construction noise.

Maximum noise levels from construction equipment such as that which would be used during various phases of pipeline construction are shown in Table 4.10-12. According to Table 4.10-12, instantaneous (L_{max}) noise levels from construction equipment could reach 96 dB at 50 feet. Besides the equipment listed in Table 4.10-12, other more specialized equipment (such as the HDD rig) would also be used. Typical operational noise levels for this specialized equipment are not available, though it is anticipated that the primary noise source would be the diesel engine. Therefore, it is not likely that any of this equipment would generate maximum noise levels in excess of the equipment listed in Table 4.10-12.

The closest receptors to construction activity are sparsely distributed residences along the rural county roadways in Yolo, Sutter, and Placer counties, and in the City of Roseville. Some of these residences would be within 50 feet of the construction right-of-way (ROW). There would be no residences along the DFM within Sacramento County. The construction noise would represent a noticeable temporary increase in ambient noise levels at the nearest residences in Yolo, Sutter, and Placer counties, and in the City of Roseville. Increases in ambient noise due to construction would be much less at the nearest schools or other sensitive receptors, but could still be noticeable.

In Yolo County, additional sensitive receptors are found in the town of Yolo and include the Woodland Community School and the Yolo Branch Library (approximately 4,000 feet and 3,500 feet south to Line 407, respectively). In Placer County, the nearest sensitive receptors are two schools. The Alpha School (historical) is approximately 0.5 mile north of Line 407 along Baseline Road, and the Coyote Ridge Elementary School is approximately 0.4 mile north-northeast of the eastern terminus of Line 407 at the intersection of Baseline Road and Fiddyment Road.

Maximum construction noise levels could reach up to 86 dBA at the nearest residential receptors to the pipeline (representing a worst-case scenario for receptors in all four counties that are within 50 feet of the construction ROW). In Sutter County there are two residences locate within 50 feet of the construction ROW. In Yolo County, which represents the most sensitive receptors along the pipeline, maximum sound levels from construction noise at the nearest sensitive receptors are expected to be approximately 58 dBA at both the Woodland Community School and the Yolo Branch Library. In Placer County, maximum sound levels from construction noise at the nearest sensitive receptors are expected to be approximately 61 dBA at the Alpha School and 64 dBA at the Coyote Ridge Elementary School.

Table 4.10-12: Construction Equipment Noise Levels (dBA)

Equipment	Impact Devise	Measures L_{max}[1] (50 feet)	Predicted L_{max} (2,500 feet)
Auger drill rig	No	84	51
Backhoe	No	78	45
Boring jack power unit	No	83	50
Clam shovel (dropping)	Yes	87	54
Compactor (ground)	No	83	50
Compressor (air)	No	78	45
Concrete mixer truck	No	79	46
Concrete pump truck	No	81	48
Concrete saw	No	90	57
Crane	No	81	48
Dozer	No	82	49
Drill rig truck	No	79	46
Drum mixer	No	80	47
Dump truck	No	76	43
Excavator	No	81	48
Flat-bed truck	No	74	41
Front-end loader	No	79	46
Generator	No	81	48
Generator (<25KVA, VMS signs)	No	73	40
Gradall	No	83	50
Grapple (on backhoe)	No	87	54
Horizontal boring hydraulic jack	No	82	49
Jackhammer	Yes	89	56
Man lift	No	75	42
Mounted impact hammer (hoe ram)	Yes	90	57

Equipment	Impact Devise	Measures L_{max}[1] (50 feet)	Predicted L_{max} (2,500 feet)
Pavement scarifier	No	90	57
Paver	No	77	44
Pickup truck	No	75	42
Pneumatic tools	No	85	52
Pumps	No	81	48
Rivet buster/chipping gun	Yes	79	46
Rock drill	No	81	48
Roller	No	80	47
Scraper	No	85	52
Shears (on backhoe)	No	96	63
Slurry plant	No	78	45
Slurry trenching machine	No	80	47
Vacuum excavator (vac-truck)	No	85	52
Vacuum street sweeper	No	82	49
Vibrating hopper	No	87	54
Vibratory concrete mixer	No	80	47
Welder/torch	No	74	41

Notes:
1. L_{max} is the maximum instantaneous noise level experienced during a given period of time.
Source: Federal Transit Administration 2006.

For the work within Placer County, the predicted maximum exterior noise levels (61 to 64 dB exterior at the two nearest schools and 86 at the closest residential receptors) would exceed the land use noise standards for sensitive receptors (L_{eq} of 55 dBA between 7 a.m. and 10 p.m. and 45 dBA between 10 p.m. and 7 a.m.). For work within Sutter County, the predicted maximum exterior noise levels at the closest residential receptors would be 86 dBA. This would exceed the Sutter County land use noise standards for sensitive receptors (L_{eq} of 50 dBA between 7 a.m. and 10 p.m. and 45 dBA between 10 p.m. and 7 a.m). Yolo County does not have any standards directly related to construction or operation noise. These noise standards are intended to apply to permanent noise sources. Construction noise, however, is short-term and temporary in nature, and equipment is not in continuous operation at these maximum noise levels.

Most municipal regulations allow for exemptions to noise standards for construction provided that work is completed during daytime hours. It is anticipated that pipeline construction would progress along the routes in a manner so that noise impacts at any one residence would be of relatively short duration.

For example, the expected sequence of construction events near a given residence would include preliminary grading, topsoil stripping, digging trenches, welding, installation of the pipe, and backfill of the trenches. These activities would occur over a period of about one month, though the use of heavy equipment would probably occur over a period of only a few days. Trenching, for example, would proceed at a rate of about 1,500 to 3,000 feet per day, so the trenching equipment would only be in close proximity to a given residence for 1 to 2 days. Similarly, grading, stripping, and backfill would each occur over a 1 to 2 day period.

An HDD construction process would be employed where necessary to install the pipeline under canals, vernal pools, and major roadways. An HDD rig consists of a diesel engine that powers a drill rig and mud pumps. It is typically operated on a continuous basis after setup until the bore is completed. For this Project, HDD use would occur no closer than about 400 feet to the nearest residence (in the vicinity of Garden Highway and Riego Road), and otherwise would be 800 feet or more from the nearest rural residence. At the nearest residence, the noise level produced by an HDD rig would be about 68 dBA. In all other cases, the noise levels at the nearest residences would be no more than about 62 dBA. A setback of about 3,000 feet would be required to reach a noise level of about 50 dBA.

Even though construction activities could occur outside of normal daytime construction hours, this would only happen when the nature of the work would make it necessary to perform construction around the clock. This would be the case with only a small portion of the overall work, such as during directional drilling and hydrostatic testing. Because Project construction noise would be noticeable at various receptors during construction, PG&E would be expected to mitigate construction noise where possible and to coordinate with residents and local authorities to minimize the adverse impacts associated with construction noise. Mitigation would cover the most conservative regulations along the pipeline.

Construction of the Project would generate high levels of noise that could substantially increase ambient noise levels on a temporary basis in the vicinity of the pipeline route. In Placer County and Sacramento County, construction noise during daylight working hours is exempt from noise standards. Given that construction noise at any given location would be short-term and temporary in nature, impacts are not expected to be significant.

There are no existing noise sensitive receptors adjacent to the Project in Sacramento County.

Noise levels from Project construction would exceed criteria defined in a construction noise ordinance or general plan of the local jurisdiction in which the activity occurs.

<u>Mitigation Measures for Impact NOI-1: Project Construction</u>

MM NOI-1a. **Limited Construction Hours.** Construction activities shall be limited to daytime hours (7 a.m. to 7 p.m.) when they occur within 1,000 feet of residences, except for the operation of horizontal directional drilling equipment.

MM NOI-1b. **Best Management Practices.** When construction activities occur within 1,000 feet of residences, the following best management practices shall be implemented:

1. All construction equipment shall be fitted with factory installed mufflers and enclosures.
2. All construction equipment shall be maintained in good working order.
3. Horizontal directional drilling equipment shall be shielded from view of the nearest residences with temporary barriers (such as plywood or straw bales) that block line of sight from engines and pumps to the windows of those residences.
4. PG&E shall provide a noise complaint hot line, staffed on a 24-hour basis, to allow nearby residents to submit complaints about construction-related noise. The hot line number shall be clearly posted at the construction site.

5. PG&E shall respond to noise complaints in a timely manner, so that residents may obtain any necessary relief before the construction is completed.

MM NOI-1c. **Noise Reduction Plan.** To minimize nighttime construction noise impacts, a noise reduction plan shall be developed by a qualified acoustical professional and submitted to the California State Lands Commission for review and approval. The Noise Reduction Plan shall include a set of site-specific noise attenuation measures that apply state of the art noise reduction technology to ensure that nighttime noise levels from Project sources within do not exceed the applicable county's nighttime exterior noise threshold at nearby residences.

The attenuation measures shall include, but not be limited to, the control strategies and methods for implementation, as feasible, that are listed below and shall be implemented prior to commencement of any horizontal direction drilling (HDD) construction or hydrostatic testing activities. If any of the following strategies are determined by PG&E to not be feasible, an explanation as to why the specific strategy is not feasible shall be included in the Noise Reduction Plan:

- Plan horizontal direction drill activities to minimize the amount of nighttime construction.
- Offer temporary relocation of residents within 300 feet of nighttime construction areas.
- Install temporary noise barriers, such as shields and blankets, immediately adjacent to all nighttime stationary noise sources (e.g., drilling rigs, generators, pumps, etc.).
- Install a temporary noise wall that blocks the line of sight between all nighttime HDD activities and the closest residences. The noise wall shall achieve an attenuation of at least 10 dBA.
- Fit all engines associated with nighttime HDD activities with critical silencer muffler designs that achieve attenuation of at least 15 dBA compared to standard muffler designs.

<u>Rationale for Mitigation</u>

People are typically most annoyed by noise due to activities beyond their control during nighttime hours, when most people sleep. This disproportionate response is recognized by commonly-accepted noise standards in Noise Elements and Noise Ordinances, which typically apply a 10-decibel penalty to noise occurring during nighttime hours. The proposed mitigation measures account for the increased sensitivity of people to noise at night.

By requiring that the equipment be maintained in good working order with all original silencing devices intact, the proposed mitigation measures recognize that modern construction equipment is effectively silenced to provide the maximum practical noise reduction.

The proposed shielding for the HDD equipment recognizes that such equipment must be operated on a continuous basis, and provides a practical reduction of noise by requiring an effective noise barrier between the HDD equipment and the nearest residences.

Finally, the proposed mitigation measures provide a method for residents to contact PG&E in the event of a noise complaint, and they require PG&E to resolve the complaints in a fair and practical manner.

Implementation of an approved Noise Reduction Plan that would limit nighttime noise levels at nearby residences and limit nighttime noise levels to the most extent feasible would reduce nighttime construction noise impacts.

By implementation of MM NOI-1a, MM NOI-1b, and MM NOI-1c, noise impacts would be reduced to less than significant.

Impact NOI-2: Groundborne Vibration or Noise

Groundborne vibrations or groundborne noise from Project activities would have substantial direct or indirect effects on persons or structures (Potentially Significant, Class II).

Heavy-duty construction equipment could be used during the construction phase of the Project. Typical levels of groundborne vibration produced by various pieces of construction equipment that could be used during Project construction are shown in Table 4.10-9. While some specialized pieces of equipment other than those listed in

Table 4.10-9 may be used during construction, it is unlikely that maximum vibration levels associated with this equipment would be greater than the listed equipment.

According to the site maps, some residential receptors would be within 50 feet of the pipeline alignment. Consequently, construction could contribute noticeable levels of groundborne vibration at any of these receptors. However, these would be short-term exposures that would occur primarily in the daytime.

Based upon Table 4.10-13, vibration due to the operation of equipment such as heavy trucks and bulldozers associated with the Project could be perceptible, and could result in annoyance for residents in homes located within about 60 feet of the construction site. Structural damage due to construction-related vibration is unlikely beyond 25 feet of the construction site.

The majority of construction activity is expected to occur at distances greater than 60 feet from sensitive structures. Where construction activity involving heavy equipment occurs within 60 feet of residences (such as may occur along the pipeline route), the people in those homes may be annoyed, but no structural damage would be expected, provided that vibration-causing equipment is at least 25 feet from sensitive structures. The use of heavy equipment that would produce the highest vibration levels would be limited to daytime hours. Groundborne vibration or groundborne noise from Project construction activities would have substantial direct or indirect effects on persons or structures.

Table 4.10-13: Vibration Source Levels for Construction Equipment

Equipment	Peak Particle Velocity at 25 feet (inches/seconds)	Approximate Vibration Level (VdB) at 25 feet
Large Bulldozer	0.089	87
Caisson Drilling	0.089	87
Loaded Trucks	0.076	86
Jackhammer	0.035	79
Small Bulldozer	0.003	58
Source: U.S. Department of Transportation, Transit Noise and Vibration Impact Assessment, Federal Transit Administration May 2006.		

Mitigation Measures for Impact NOI-2: Groundborne Vibration or Noise

MM NOI-2a. **Distance from Residences.** Avoid operating heavy equipment closer than 25 feet from any residences.

MM NOI-2b. **Heavy-loaded Trucks.** Route heavily-loaded trucks away from residential streets where possible. Select streets with the fewest homes if no alternatives are available.

MM NOI-2c. **Earth Moving Equipment/Distance from Vibration-Sensitive Sites.** Operate earth-moving equipment as far away from vibration-sensitive sites as possible, and no closer than 25 feet. Phase demolition, earth-moving and ground-impacting operations so as not to occur in the same time period.

MM NOI-2d. **Nighttime Construction.** Avoid conducting nighttime construction activities immediately adjacent to residences during non-HDD activities.

Rationale for Mitigation

The proposed mitigation measures would serve to move potentially significant sources of vibration as far from sensitive receptors as possible. The total vibration level produced may be significantly reduced when each vibration source operates separately. People are more aware of vibration in their homes during the nighttime hours.

4.10.6 Impacts of Alternatives

A No Project Alternative as well as twelve options have been proposed for the alignment in order to minimize or eliminate environmental impacts of the proposed Project and to respond to comments from nearby landowners. The twelve options, labeled A through L, have been analyzed in comparison to the portion of the proposed route that has been avoided as a result of the option. Descriptions of the options can be found in Section 3.0, Alternatives and Cumulative Projects, and are depicted in Figure 3-2A through Figure 3-2K.

No Project Alternative

Without the Project, there would be no temporary construction activities and consequent noise and vibration, and no potential for long-term noise production by aboveground facilities. Thus, there would be no noise and vibration impacts.

Option A

Option A would shift approximately 14 miles of pipeline from the more densely populated area around Line 406 to the sparsely populated area to the north. Under Option A, the alternative Capay Metering Station (CMS) would be moved approximately 1.5 miles north of where it would be placed under the proposed Project. This option would increase the overall pipeline length by approximately 2,200 feet. Similar to the proposed Project, there are no existing sensitive receptors located close to the CMS. It does not appear that any noise sensitive development will occur in the vicinity of the CMS, which is surrounded by agricultural land uses.

The closest receptor to construction activity in Option A is a farmhouse north of Road 16 at Road 86. There are no other sensitive receptors in the vicinity of Option A, nor are there any public airports or airstrips. Option A crosses five fewer private residential parcels than Line 406. One residence would be located within 200 feet of the pipeline construction under Option A, whereas eight residences would be located within 200 feet of construction under the proposed Project. Under Option A, the nearest residence to an HDD crossing would be located approximately 490 feet away from the HDD construction pit. The residence nearest the proposed Project's HDD crossing would be located approximately 100 feet from the HDD construction pit. As a result, there would be fewer potential construction-related noise or vibration impacts along this segment of the pipeline.

Option B

Option B would shift approximately 6.5 miles of pipeline from the more densely populated area around Line 406 to the sparsely populated area to the north. Under Option B. the alternative CMS would be moved approximately 1.5 miles north of where it would be placed under the proposed Project. Similar to the proposed Project, there are no existing sensitive receptors located close to the alternative CMS. It does not appear that any noise sensitive development will occur in the vicinity of the alternative CMS, which is surrounded by agricultural land uses.

Option B crosses approximately two more private residential parcels than Line 406. However, there are no residences within 200 feet of the I-505 HDD crossing under Option B or the proposed Project. There are no residences located within 200 feet of the pipeline construction under Option B or proposed Project. There are no other sensitive receptors in the vicinity of Option B, nor are there any public airports or airstrips. As a result, there would be no change in potential construction-related noise or vibration impacts along this segment of the pipeline.

Option C

There are no residences located within 200 feet of the pipeline construction under Option C or the proposed Project. There are no other sensitive receptors in the vicinity of Option C, nor are there any public airports or airstrips. As a result, there would be no change in potential construction-related noise or vibration impacts.

Option D

Under Option D, five residences would be located within 200 feet of the pipeline construction, whereas no residences would be located within 200 feet of construction for the proposed Project. There are no other sensitive receptors in the vicinity of Option D, nor are there any public airports or airstrips. There would be an increase in potential construction-related noise or vibration impacts associated with this option.

Option E

This alternative would relocate pipeline construction along CR-19 west of I-505. Option E crosses approximately 3 more private residential parcels than Line 406. Under Option E, three residences would be located within 200 feet of the pipeline construction, whereas no residences would be located within 200 feet of construction for the proposed Project. There are no other sensitive receptors in the vicinity of Option E, nor are there any public airports or airstrips. There would be an increase in potential construction-related noise or vibration impacts associated with this option.

Option F

Under Option F, no residences would be located within 200 feet of the pipeline construction, whereas one residence would be located within 200 feet of construction for the proposed Project. There are no other sensitive receptors in the vicinity of Option F, nor are there any public airports or airstrips. There would be similar potential construction-related noise or vibration impacts associated with this option.

Option G

There are three residences located within 200 feet of Option G and the proposed Project. Under Option G, however, the nearest residence would be located approximately 10 feet closer to construction activities than under the proposed

Project. This would result in a less than significant change in construction noise levels. There are no public airports or airstrips in the vicinity of Option G. There would be no change in potential construction-related noise or vibration impacts associated with this option.

Option H

Option H crosses approximately three fewer private residential parcels than Line 406. Under Option H, only one residence would be located within 200 feet of the pipeline construction, whereas five residences would be located within 200 feet of construction for the proposed Project. Under Option H, the nearest residence to an HDD crossing would be located more than 2,000 feet away from the HDD construction pit. The residence nearest the proposed Project's HDD crossing would be located approximately 360 feet from the HDD construction pit. There are no other sensitive receptors in the vicinity of Option H.

The pipeline would pass within about 1.4 miles of the terminal buildings at Sacramento International Airport, and within about 0.5 miles of the runway ends. Project-related construction workers would be exposed to noise from aircraft arrivals and/or departures. Aircraft sound levels could exceed 65 dBA for about 30 seconds per noise event, with maximum noise levels in the range of 85-90 dBA. The noise due to aircraft overflights would not require hearing protection measures beyond those already required for the exposure to noise produced by heavy equipment, but the aircraft noise events would add slightly to the total employee noise exposure. With this option, there would be fewer potential construction-related noise or vibration impacts for sensitive receivers, but there would be slight increases in noise exposure for project construction workers.

Option I

Under Option I, four residences would be located within 200 feet of the pipeline construction, whereas eight residences would be located within 200 feet of construction for the proposed Project. There are no other sensitive receptors in the vicinity of Option I, nor are there any public airports or airstrips. Freedom Field (a private airstrip) is located within about 0.5 miles of Option I, but the main pipeline along Baseline Road passes closer to this facility than does Option I. The project does not create alternate land uses that would modify the long-term noise conditions for people who live or work in the vicinity of the airport or airstrip and are regularly exposed to airplane noise. Project-related construction workers would conceivably be exposed to noise from airplanes for short periods of time during construction when construction occurs close to the airport runway ends. This exposure would not be expected to be excessive and would occur only temporarily. There would be fewer potential construction-related noise or vibration impacts associated with this option.

Option J

Under Option J, six residences would be located within 200 feet of the pipeline construction, whereas eight residences would be located within 200 feet of construction for the proposed Project. There are no other sensitive receptors in the vicinity of Option I, nor are there any public airports or airstrips. Freedom Field (a private airstrip) is located within about 0.5 miles of Option J, but the main pipeline along Baseline Road passes closer to this facility than does Option J. The project does not create alternate land uses that would modify the long-term noise conditions for people who live or work in the vicinity of the airport or airstrip and are regularly exposed to airplane noise. Project-related construction workers would conceivably be exposed to noise from airplanes for short periods of time during construction when construction occurs close to the airport runway ends. This exposure would not be expected to be excessive and would occur only temporarily. There would be fewer potential construction-related noise or vibration impacts associated with this option.

Option K

This alternative would relocate pipeline construction approximately 150 feet north of Baseline Road in an uninhabited area. There are no residences within 200 feet of Option K or the proposed Project. There are no other sensitive receptors in the vicinity of Option K, nor are there any public airports or airstrips. As a result, there would be no change in potential construction-related noise or vibration impacts.

Option L

Under Option L, a portion of the proposed Project adjacent to Baseline Road would be constructed utilizing HDD instead of trenching. Option L would not change the location of the route, but would change the construction method from trenching to HDD. However, there are no residences located near Option L. There are no other sensitive receptors in the vicinity of Option L, nor are there any public airports or airstrips. As a result, there would be no change in potential construction-related noise or vibration impacts.

Table 4.10-14: Comparison of Alternatives for Noise

Alternative	Comparison with Proposed Project
No Project	No Impacts
Option A	Fewer Impacts
Option B	Similar Impacts
Option C	Similar Impacts
Option D	Greater Impacts
Option E	Greater Impacts
Option F	Similar Impacts
Option G	Similar Impacts
Option H	Fewer Impacts
Option I	Fewer Impacts
Option J	Fewer Impacts
Option K	Similar Impacts
Option L	Similar Impacts
Source: Michael Brandman Associates 2009.	

4.10.7 Cumulative Projects Impact Analysis

The proposed Project, in addition to other projects in the area, may contribute to cumulative noise impacts. Cumulative noise impacts associated with the Project could occur if the noise levels due to aboveground facilities were to add significantly to ambient noise levels.

Cumulative noise impacts associated with the Project could occur if the noise levels due to aboveground facilities were to add significantly to ambient noise levels. The areas in which such impacts could potentially occur are those of the residential neighborhoods near the Baseline/Brewer Road Main Line Valve (MLV) and the Baseline Road Pressure Regulating Station (BRS). However, in those areas, vehicular traffic is the dominant noise source, and existing traffic noise levels would greatly exceed the mitigated project noise level due to aboveground facilities. As a result, there would be no cumulative noise impact due to the Project.

4.10.8 Summary of Impacts and Mitigation Measures

Noise levels from Project operations would not exceed any criteria defined in a noise ordinance or general plan of the local jurisdiction in which the activity occurs, and noise levels from Project operations would not result in a substantial permanent increase in noise levels. No mitigation measures would be required for these less than significant impacts (Class III). Noise levels from Project construction would exceed criteria defined in a construction noise ordinance or general plan of the local jurisdiction in which the activity occurs, resulting in a Class II impact. This impact would be mitigated to a less than significant level after applying MM NOI-1a through NOI-1c and APM NOI-1. Groundborne vibrations or groundborne noise from Project construction activities would have substantial direct or indirect effects on persons or structures, resulting in a Class II impact. This impact would be mitigated to a less than significant level after applying MM NOI-2a through NOI-2d.

Table 4.10-15: Summary of Noise Impacts and Mitigation Measures

Impact	Mitigation Measure
NOI-1. Project construction.	**NOI-1a.** Limited construction hours. **NOI-1b.** Best management practices. **NOI-1c.** Noise reduction plan.
NOI-2. Groundborne vibration or noise.	**NOI-2a.** Distance from residences. **NOI-2b.** Heavy loaded trucks. **NOI-2c.** Earth-moving equipment/distance from vibration-sensitive sites. **NOI-2d.** Nighttime construction.
Source: Michael Brandman Associates 2009.	

4.11 RECREATION

The proposed Project passes through Yolo, Sutter, Sacramento, and Placer counties. In three of those counties, there are recreational resources within 1 mile of the proposed Project right-of-way (ROW). This Section describes the existing condition of recreation resources and evaluates the potential impacts of the proposed Project on those resources. Section 4.11.1 describes the recreation setting, with an emphasis on the Project vicinity, rather than the proposed alignment ROW. Recreation facilities within 0.5 miles of the proposed Project are identified.

4.11.1 Environmental Setting

The proposed pipeline alignment traverses lands in Sutter County, Yolo County, Sacramento County, Placer County, and within the Sphere of Influence of the City of Roseville. The area along the proposed alignment passes through predominantly agricultural or undeveloped areas. Line 406 is located entirely in north-central Yolo County and extends from the existing Lines 400 and 401 to the existing Line 172A for approximately 14 miles through unincorporated areas of Yolo County. The area traversed by Line 406 is generally used for agricultural production. Line 407 West extends from the eastern terminus of Line 406 in Yolo County to the junction of Riego Road and Powerline Road, approximately 1 mile east of the Sacramento River, in Sutter County. Line 407 East extends from the eastern terminus of Line 407 West and extends east to the intersection of Fiddyment road and Baseline Road.

Yolo County

Recreational opportunities within Yolo County include community parks, State recreation areas, historic parks, lakes, wine tasting, golf, river rafting, boating, and swimming. Yolo County owns and maintains 11 parks and recreation facilities throughout the County, and none of these recreation facilities are located directly within the Project area. The Esparto Community Park is the closest park to the Project area at approximately 2.5 miles south of the Line 406 Project area, in the town of Esparto. However, recreational activities that may take place in the vicinity of the Project area consist of water sports and leisure activities along Cache Creek and the Sacramento River. A portion of the eastern end of Line 407 West is adjacent to the Gray's Bend area of the Sacramento River. The line then continues east and passes under the Sacramento River. There are no boat-launching facilities or public beaches on the Yolo County side of the Sacramento River in these areas;

however, boats, kayaks, or river rafts launched from other parts of the river may be present at any given time.

Sutter County

The main recreational activities offered in the Sutter County portion of the Project area revolve around the Sacramento River. Lines 407 West and 407 East cross approximately 6 miles of unincorporated Sutter County. There are no community parks or other recreational facilities within 0.5 mile of the Project area. Recreational activities are limited to the vicinity of the Sacramento River crossing. The Rio Ramaza Marina is a private marina on an approximately 0.35-mile stretch of the Sacramento River, which is open to public access. The north end of the marina is immediately adjacent to the Sacramento River crossing of Line 407 West. This marina offers activities such as fishing, swimming, camping, and boating.

Sacramento County

Sacramento County supports a wide variety of recreational activities. The Powerline Road Distribution Feeder Main (DFM) segment of the Project is in the northwest corner of the county. The nearest recreation area to the Project site is the Teal Bend Golf Course, which is approximately 2 miles southwest of the DFM area.

There are no recreational areas in Sacramento County within 0.5 mile of the Line 407 East Project area. The closest recreational area is the Dry Creek Parkway, managed by Sacramento County. The northern border of the parkway is approximately 1.5 miles south of the Line 407 East Project site.

Placer County

Line 407 East extends approximately 6.5 miles into the southwestern corner of Placer County, terminating within the City of Roseville's sphere of influence. Bill Santucci Park, located within the Roseville city limits, is the closest recreational facility to the Project at 0.41 miles from the eastern terminus of Line 407 East. Doyle Ranch Park and Morgan Creek Golf Club, also located in Roseville, are approximately 0.85 and 0.80 miles south of the proposed Project, respectively. Existing and proposed bikeways are located immediately adjacent to the Line 407 East Project area. The City of Roseville has designated Baseline Road and Fiddyment Road as Class II bikeways, i.e., on-road bikeways. These roads mark the boundary of the city's western limits and the termination of Line 407 East.

Junction Boulevard, approximately 0.3 mile east of the Project, is designated as a proposed bikeway by the City of Roseville.

4.11.2 Regulatory Setting

Federal

There are no Federal regulations applicable to recreation resources, since there are no federally-managed recreation areas, wilderness areas or wild and scenic rivers in the Project vicinity.

State

California State Park General Plans

A General Plan is required for units of the California State Park System before permanent facilities can be provided. When completed, the General Plan directs the long-range development and management of a park by defining broad policy and program guidance. The General Plan is specific to each park and gives a general description of the applicable park; an evaluation of applicable resources including cultural resources, natural resources, and management; a discussion of land use and facilities at the park; park operations; and environmental impacts related to the park. The closest State Parks to the Project site are Woodland Opera House State Historic Park in Woodland and Colusa-Sacramento River State Recreation Park in Sacramento, neither of which is located within the Project area.

Local

Yolo County General Plan

The following recreation goals, objectives, and policies related to recreation from the Open Space and Recreation Element of the Yolo County General Plan (Yolo County 2002) were considered in this analysis.

> **Policy REC 1: Recreation Basic.** Yolo County acquires, maintains and provides a variety of park, open and natural areas for recreational and leisure pursuits at the regional, community and neighborhood level through means of California statute, established land use controls, regulations, real property transfer, and the advice, guidance and cooperation of other jurisdictions and through coordination with other elements of this General Plan, as amended. It shall be the basic recreation policy of the County to:

1. Protect and preserve as many of the County's recreational and scenic resources as possible;
2. Maintain diversified regional-type recreation facilities and programs;
3. Assist in preserving the open space resources of the County;
4. Cooperate with special districts, cities, adjacent counties, and State and Federal agencies in the acquisition, development and administration of recreation facilities, resources and programs for joint use and mutual advantage;
5. Cooperate with and encourage private individuals and organizations in the preservation, acquisition, and administration of recreation resources;
6. Assist local rural communities in obtaining a basic level of recreation service;
7. Encourage and assist in the development of bicycle and hiking trails in and to County parks and recreation areas;
8. Encourage Greater understanding of the park system and the resources it protects by development of an interpretive program.

Sutter County General Plan

The following recreation goals, objectives, and policies related to recreation from the Conservation/Open Space Element of the Sutter County General Plan (Sutter County 1996) were considered in this analysis.

Goal 5.A: To provide adequate park and open space areas for passive and active recreational, social, educational, and cultural opportunities for the residents of Sutter County.

Policy 5.A-1: The County shall strive to maintain and improve the distribution of local and regional parks to support the recreational needs of Sutter County residents.

Policy 5.A-2: The County shall strive to achieve and maintain a standard of 10 acres of parkland per 1,000 population. This target ratio should be further divided between neighborhood, community, and regional parks according to the standards set forth in the County’s park and recreation master plan.

Placer County General Plan

The following recreation goals, objectives, and policies related to recreation from the Land use Element of the Placer County General Plan (Placer County 1994) were considered in this analysis.

> **Goal 1.G:** To designate land for and promote the development and expansion of public and private recreational facilities to serve the needs of residents and visitors.
>
> **Goal 5.A:** To develop and maintain a system of conveniently-located, properly-designed parks and recreational facilities to serve the needs of present and future residents, employees, and visitors.
>
> **Policy 5.A.1:** The County shall strive to achieve and maintain a standard of 5 acres of improved parkland and 5 acres of passive recreation area or open space per 1,000 population.
>
> **Policy 5.A.4:** The County shall consider the use of the following open space areas as passive parks to be applied to the requirement for 5 acres of passive park area for every 1,000 residents.
>
> a) Floodways
>
> b) Protected riparian corridors and stream environment zones
>
> c) Protected wildlife corridors
>
> d) Greenways with the potential for trail development
>
> e) Open water (e.g., ponds, lakes, and reservoirs)
>
> f) Protected woodland areas
>
> g) Protected sensitive habitat areas providing that interpretive displays are provided (e.g., wetlands and habitat for rare, threatened or endangered species.)
>
> Buffer areas are not considered as passive park areas if such areas are delineated by setbacks within private property. Where such areas are delineated by public easements or are held as common areas with homeowner/property owner access or public access, they will be considered as

passive park areas provided that there are opportunities for passive recreational use.

Policy 5.A.8: The County shall strive to maintain a well-balanced distribution of local parks, considering the character and intensity of present and planned development and future recreation needs.

Policy 5.A.13: The County shall ensure that recreational activity is distributed and managed according to an area's carrying capacity, with special emphasis on controlling adverse environmental impacts, conflict between uses, and trespass. At the same time, the regional importance of each area's recreation resources shall be recognized.

Policy 5.A.22: The County shall encourage compatible recreational use of riparian areas along streams and creeks where public access can be balanced with environmental values and private property rights.

Sacramento County General Plan

The following open space goals and policies related to recreation from the Open Space Element of the Sacramento County General Plan (Sacramento County 1993) were considered in this analysis.

Goal: Open space lands in Sacramento permanently protected through coordinated use of regulation, acquisition, density transfer, and incentive programs.

Policy OS-1: Permanently protect, as open space, areas of natural resource value, including wetlands preserve, riparian corridors, woodlands, and floodplains.

Policy OC-2: Maintain open space and natural areas that are interconnected and of sufficient size to protect biodiversity, accommodate wildlife movement and sustain ecosystems.

City of Roseville General Plan

The following parks and recreation goals and policies related to recreation from the Parks and Recreation Element of the City of Roseville General Plan (City of Roseville 2004) were considered in this analysis.

Parks and Recreation Goal 1: Provide adequate park land, recreational facilities, and programs within the City of Roseville through public and private resources.

Parks and Recreation Goal 2: Provide residents with both active and passive recreation opportunities by maximizing the use of dedicated park lands and open space areas.

Parks and Recreation Policy 1: The City shall ensure the provision of 9 acres of park land per 1,000 residents.

Parks and Recreation Policy 5: Cooperate with other jurisdictions to provide regional recreation facilities, where appropriate.

4.11.3 Significance Criteria

An adverse impact on recreation or special use areas is considered significant and would require mitigation if Project construction or operation would:

1. Prevent or impede access to an established recreation area during its peak use periods or for more than 1 year;
2. Adversely affect areas of special recreational concern (such as a wilderness area or wilderness study area);
3. Provide or enable access to previously inaccessible, environmentally sensitive areas;
4. Result in permanent alteration of a recreation resource (e.g., use of recreation lands or waters, disturbance to unique vegetation, habitat or outstanding landscape characteristics);
5. Result in increased use of existing neighborhood and regional parks, resulting in physical deterioration; or
6. Result in substantial adverse physical effects from construction of new or altered recreational facilities.

4.11.4 Applicant Proposed Measures

No Applicant Proposed Measures (APMs) have been identified by PG&E related to recreation.

4.11.5 Impact Analysis and Mitigation

Impact Discussion

Cache Creek, the Sacramento River, Rio Ramaza Marina, and existing Class II bikeways and Bill Santucci Park in the City of Roseville are the recreational facilities located within 0.5 mile of the Project area (California State Parks 2008, City of Roseville 2008, Placer County 1994, Sacramento County 1993, Sutter County 1996, Yolo County 2002). Project construction would not require the construction of new facilities. The Project would not impact population in the area and, consequently, would not create the need for new or expanded parks or facilities.

Access to Established Recreation Area

The Project would not prevent or impede access to an established recreation area during its peak use periods or for more than 1 year. The proposed Project would not limit access to special use and recreational areas during either Project construction or operation. The Project would be constructed within 0.5 mile of Cache Creek, the Sacramento River, Rio Ramaza Marina, and existing Class II bikeways and Bill Santucci Park in the City of Roseville. The Sacramento River would be crossed using horizontal directional drilling techniques, so boating, rafting, and use of the Rio Ramaza Marina would not be interrupted. There would be no need to close City of Roseville bikeways within the vicinity of the Project area because the Project would not extend past the intersection of Baseline Road and Fiddyment Road. Access to Bill Santucci Park would not be affected by construction or operation of the proposed Project. Therefore, this impact would be considered less than significant (Class III).

Special Recreational Concern

The Project would not adversely affect areas of special recreational concern (such as a wilderness area or wilderness study area). There are no areas of special recreational concern within the Project area. Therefore, this impact would be considered less than significant (Class III).

Environmentally Sensitive Area Access

The Project would not provide or enable access to previously inaccessible, environmentally sensitive areas. The proposed Project would not include construction of new roads and therefore would not provide access to previously inaccessible areas. Therefore, this impact would be considered less than significant (Class III).

Permanent Alteration to Recreation Resource

The Project would not result in permanent alteration of a recreation resource (e.g., use of recreation lands or waters, disturbance to unique vegetation, habitat or outstanding landscape characteristics). The Project would be constructed within 0.5 mile of Cache Creek, the Sacramento River, Rio Ramaza Marina, and existing Class II bikeways and Bill Santucci Park in the City of Roseville. However, these recreational resources would not be impacted by the proposed Project and no permanent alteration would occur to these recreational resources. Therefore, this impact would be considered less than significant (Class III).

Increased Use of Parks

The Project would not result in increased use of existing neighborhood and regional parks, resulting in physical deterioration. Increases in demand for recreational facilities are typically associated with substantial increases in population. Since the proposed Project is a response to projected growth in the region, the Project would not result in increased population growth or the increased use of neighborhood, regional, or other recreational activities such that substantial physical deterioration of existing facilities would occur or be accelerated. As further described in Section 4.12, Population and Housing/Public Services/Utilities and Service Systems, the proposed Project would require 90 to 130 construction workers, including PG&E and contracted construction personnel. These employees would be drawn primarily from the local area per union agreement. While the construction workers may use nearby recreation facilities during breaks, this would be temporary in nature and would not substantially increase the use of recreational facilities in the Project vicinity.

The proposed Project would not result in a substantial increased demand for recreational facilities or adversely affect Yolo County, Sutter County, Sacramento County, Placer County, and City of Roseville park/population facilities because the construction activities would be temporary. Therefore, impacts related to the increased use of existing neighborhood and regional parks, resulting from deterioration, would be less than significant (Class III).

Recreational Facilities

The Project would not result in substantial adverse physical effects from construction of new or altered recreational facilities. The proposed Project does not include any plans for the addition of any recreational facilities nor would it require the construction or expansion of recreational facilities. Therefore, the proposed Project would not result in any adverse physical effects on the environment from construction or expansion of additional recreational facilities. This impact would be less than significant (Class III).

4.11.6 Impacts of Alternatives

A No Project Alternative as well as twelve options have been proposed for the alignment in order to minimize or eliminate environmental impacts of the proposed project and to respond to comments from nearby landowners. The twelve options, labeled A through L, have been analyzed in comparison to the portion of the proposed route that has been avoided as a result of the option. Descriptions of the options can be found in Section 3.0, Alternatives and Cumulative Projects, and are depicted in Figure 3-2A through 3-2K.

No Project Alternative

Under the No Project Alternative Lines 406 and 407 would not be constructed. As a result there would not be any impact to recreational resources.

Option A

The area through which the Option A alignment would be similar to the proposed Project and consist primarily of agricultural areas. There are not any recreation resources to be avoided along the Option A portion of the proposed alignment; therefore, there would be no change in impacts regarding protection of recreation resources. There would not be a change in the magnitude of impacts for any of the significance criteria. Option A would not prevent or impede access to an established recreation area since this alignment would not pass through any recreational areas. Nor would Option A adversely affect areas of special recreational concern since there are no areas of special recreational concern within the Option A area. Nor would Option A provide or enable access to previously inaccessible, environmentally sensitive areas, since no roads would be constructed as part of Option A. Option A would not result in increased use of existing neighborhood and regional parks, nor result in substantial adverse physical effects from construction of new or altered recreational facilities. Therefore, all impacts would remain the same as the proposed Project under Option A.

Option B

The area through which the Option B alignment would be similar to the proposed Project and consist primarily of agricultural areas. There are not any recreation resources to be avoided along the Option B portion of the proposed alignment; therefore, there would be no change in impacts regarding protection of recreation resources. There would not be a change in the magnitude of impacts for any of the significance criteria. Option B would not prevent or impede access to an established recreation area since this alignment would not pass through any recreational areas. Nor would Option B adversely affect areas of special recreational concern since there are no areas of special recreational concern within the Option B area. Nor would Option B provide or enable access to previously inaccessible, environmentally sensitive areas, since no roads would be constructed as part of Option B. Option B would not result in increased use of existing neighborhood and regional parks, nor result in substantial adverse physical effects from construction of new or altered recreational facilities. Therefore, all impacts would remain the same as the proposed Project under Option B.

Option C

The area through which the Option C alignment would be similar to the proposed Project and consist primarily of agricultural areas. There are not any recreation resources to be avoided along the Option C portion of the proposed alignment; therefore, there would be no change in impacts regarding protection of recreation resources. There would not be a change in the magnitude of impacts for any of the significance criteria. Option C would not prevent or impede access to an established recreation area since this alignment would not pass through any recreational areas. Nor would Option C adversely affect areas of special recreational concern since there are no areas of special recreational concern within the Option C area. Nor would Option C provide or enable access to previously inaccessible, environmentally sensitive areas, since no roads would be constructed as part of Option C. Option C would not result in increased use of existing neighborhood and regional parks, nor result in substantial adverse physical effects from construction of new or altered recreational facilities. Therefore, all impacts would remain the same as the proposed Project under Option C.

Option D

The area through which the Option D alignment would be similar to the proposed Project and consist primarily of agricultural areas. There are not any recreation resources to be avoided along the Option D portion of the proposed alignment; therefore, there would be no change in impacts regarding protection of recreation resources. There would not be a change in the magnitude of impacts for any of the significance criteria. Option D would not prevent or impede access to an established recreation area since this alignment would not pass through any recreational areas. Nor would Option D adversely affect areas of special recreational concern since there are no areas of special recreational concern within the Option D area. Nor would Option D provide or enable access to previously inaccessible, environmentally sensitive areas, since no roads would be constructed as part of Option D. Option D would not result in increased use of existing neighborhood and regional parks, nor result in substantial adverse physical effects from construction of new or altered recreational facilities. Therefore, all impacts would remain the same as the proposed Project under Option D.

Option E

The area through which the Option E alignment would be similar to the proposed Project and consist primarily of agricultural areas. There are not any recreation resources to be avoided along the Option E portion of the proposed alignment; therefore, there would be no change in impacts regarding protection of recreation resources. There would not be a change in the magnitude of impacts for any of the significance criteria. Option E would not prevent or impede access to an established recreation area since this alignment would not pass through any recreational areas. Nor would Option E adversely affect areas of special recreational concern since there are no areas of special recreational concern within the Option E area. Nor would Option E provide or enable access to previously inaccessible, environmentally sensitive areas, since no roads would be constructed as part of Option E. Option E would not result in increased use of existing neighborhood and regional parks, nor result in substantial adverse physical effects from construction of new or altered recreational facilities. Therefore, all impacts would remain the same as the proposed Project under Option E.

Option F

The area through which the Option F alignment would be similar to the proposed Project and consist primarily of agricultural areas. There are not any recreation resources to be avoided along the Option F portion of the proposed alignment; therefore, there would be no change in impacts regarding protection of recreation resources. There would not be a change in the magnitude of impacts for any of the significance criteria. Option F would not prevent or impede access to an established recreation area since this alignment would not pass through any recreational areas. Nor would Option F adversely affect areas of special recreational concern since there are no areas of special recreational concern within the Option F area. Nor would Option F provide or enable access to previously inaccessible, environmentally sensitive areas, since no roads would be constructed as part of Option F. Option F would not result in increased use of existing neighborhood and regional parks, nor result in substantial adverse physical effects from construction of new or altered recreational facilities. Therefore, all impacts would remain the same as the proposed Project under Option F.

Option G

The area through which the Option G alignment would be similar to the proposed Project and consist primarily of agricultural areas. There are not any recreation resources to be avoided along the Option G portion of the proposed alignment; therefore, there would be no change in impacts regarding protection of recreation resources. There would not be a change in the magnitude of impacts for any of the significance criteria. Option G would not prevent or impede access to an established recreation area since this alignment would not pass through any recreational areas. Nor would Option G adversely affect areas of special recreational concern since there are no areas of special recreational concern within the Option G area. Nor would Option G provide or enable access to previously inaccessible, environmentally sensitive areas, since no roads would be constructed as part of Option G. Option G would not result in increased use of existing neighborhood and regional parks, nor result in substantial adverse physical effects from construction of new or altered recreational facilities. Therefore, all impacts would remain the same as the proposed Project under Option G.

Option H

The area through which the Option H alignment would be similar to the proposed Project and consist primarily of agricultural areas. There are not any recreation resources to be avoided along the Option H portion of the proposed alignment; therefore, there would be no change in impacts regarding protection of recreation resources. There would not be a change in the magnitude of impacts for any of the significance criteria. Option H would not prevent or impede access to an established recreation area since this alignment would not pass through any recreational areas. Nor would Option H adversely affect areas of special recreational concern since there are no areas of special recreational concern within the Option H area. Nor would Option H provide or enable access to previously inaccessible, environmentally sensitive areas, since no roads would be constructed as part of Option H. Option H would not result in increased use of existing neighborhood and regional parks, nor result in substantial adverse physical effects from construction of new or altered recreational facilities. Therefore, all impacts would remain the same as the proposed Project under Option H.

Option I

The area through which the Option I alignment would be similar to the proposed Project and consist primarily of agricultural areas. There are not any recreation resources to be avoided along the Option I portion of the proposed alignment; therefore, there would be no change in impacts regarding protection of recreation resources. There would not be a change in the magnitude of impacts for any of the significance criteria. Option I would not prevent or impede access to an established recreation area since this alignment would not pass through any recreational areas. Nor would Option I adversely affect areas of special recreational concern since there are no areas of special recreational concern within the Option I area. Nor would Option I provide or enable access to previously inaccessible, environmentally sensitive areas, since no roads would be constructed as part of Option I. Option I would not result in increased use of existing neighborhood and regional parks, nor result in substantial adverse physical effects from construction of new or altered recreational facilities. Therefore, all impacts would remain the same as the proposed Project under Option I.

Option J

The area through which the Option J alignment would be similar to the proposed Project and consist primarily of agricultural areas. There are not any recreation resources to be avoided along the Option J portion of the proposed alignment; therefore, there would be no change in impacts regarding protection of recreation resources. There would not be a change in the magnitude of impacts for any of the significance criteria. Option J would not prevent or impede access to an established recreation area since this alignment would not pass through any recreational areas. Nor would Option J adversely affect areas of special recreational concern since there are no areas of special recreational concern within the Option J area. Nor would Option J provide or enable access to previously inaccessible, environmentally sensitive areas, since no roads would be constructed as part of Option J. Option J would not result in increased use of existing neighborhood and regional parks, nor result in substantial adverse physical effects from construction of new or altered recreational facilities. Therefore, all impacts would remain the same as the proposed Project under Option J.

Option K

The area through which the Option K alignment would be similar to the proposed Project and consist primarily of agricultural areas. There are not any recreation resources to be avoided along the Option K portion of the proposed alignment; therefore, there would be no change in impacts regarding protection of recreation resources. There would not be a change in the magnitude of impacts for any of the significance criteria. Option K would not prevent or impede access to an established recreation area since this alignment would not pass through any recreational areas. Nor would Option K adversely affect areas of special recreational concern since there are no areas of special recreational concern within the Option K area. Nor would Option K provide or enable access to previously inaccessible, environmentally sensitive areas, since no roads would be constructed as part of Option K. Option K would not result in increased use of existing neighborhood and regional parks, nor result in substantial adverse physical effects from construction of new or altered recreational facilities. Therefore, all impacts would remain the same as the proposed Project under Option K.

Option L

The area through which the Option L alignment would be similar to the proposed Project and consist primarily of agricultural areas. There are not any recreation resources to be avoided along the Option L portion of the proposed alignment; therefore, there would be no change in impacts regarding protection of recreation resources. There would not be a change in the magnitude of impacts for any of the significance criteria. Option L would not prevent or impede access to an established recreation area since this alignment would not pass through any recreational areas. Nor would Option L adversely affect areas of special recreational concern since there are no areas of special recreational concern within the Option L area. Nor would Option L provide or enable access to previously inaccessible, environmentally sensitive areas, since no roads would be constructed as part of Option L. Option L would not result in increased use of existing neighborhood and regional parks, nor result in substantial adverse physical effects from construction of new or altered recreational facilities. Therefore, all impacts would remain the same as the proposed Project under Option L.

Table 4.11-1: Comparison of Alternatives for Recreation

Alternative	Comparison with Proposed Project
No Project	No Impacts
Option A	Similar Impacts
Option B	Similar Impacts
Option C	Similar Impacts
Option D	Similar Impacts
Option E	Similar Impacts
Option F	Similar Impacts
Option G	Similar Impacts
Option H	Similar Impacts
Option I	Similar Impacts
Option J	Similar Impacts
Option K	Similar Impacts
Option L	Similar Impacts
Source: Michael Brandman Associates 2009.	

4.11.7 Cumulative Projects Impact Analysis

The construction of other projects in the vicinity of the proposed Project could cumulatively affect recreational resources if the construction activities occurred simultaneously. As discussed in Section 3.4, Cumulative Related Future Projects, several projects are planned in the vicinity of the proposed Project. The timing of construction for the cumulative projects is unknown, and it is possible that portions of these projects could be constructed at the same time and in the same vicinity as the proposed Project. However, the proposed Project would not result in any long-term impacts on recreational resources, and would therefore not be cumulatively considerable. Cumulative impacts would be less than significant (Class III).

4.11.8 Summary of Impacts and Mitigation Measures

Since the Project would not prevent or impede access to an established recreation area, adversely affect areas of special recreational concern, provide or enable access to previously inaccessible environmentally sensitive areas, result in increased use of existing neighborhood and regional parks, or result in substantial adverse physical effects from construction of new or altered recreational facilities, no mitigation measures have been proposed.

4.12 POPULATION AND HOUSING/PUBLIC SERVICES/UTILITIES AND SERVICE SYSTEMS

This Section provides a discussion of existing population and housing, public services, and utilities and an analysis of potential impacts that may result from Project implementation.

4.12.1 Environmental Setting

The proposed pipeline would extend through unincorporated areas of Yolo, Sutter, Sacramento, and Placer counties. The majority of the pipeline's route would pass through rural agricultural lands that include structures and homes associated with agricultural land use. The Project area includes a temporary right-of-way (ROW) on either side of the proposed alignment, and any potential impacts from the Project would occur outside of the ROW in the Project vicinity.

Population and Housing

The proposed Project consists of a 40 mile-long pipeline that would cross California's Central Valley in unincorporated areas of Yolo, Sutter, Sacramento, and Placer counties. A majority of the Project, approximately 27 of the 40 miles of the route, lies in eastern Yolo County. Continuing eastward, the pipeline would traverse a portion of southernmost Sutter County and southwest Placer County. The eastern terminal of the pipeline is located outside the City of Roseville's boundaries, but within the sphere of influence. Additionally, the Powerline Road Distribution Feeder Main (DFM) would extend approximately 2.5 miles south, from the Sutter County portion of the pipeline, into Sacramento County. Future residential and commercial developments are planned in the Project vicinity within Placer, Sutter and Sacramento counties.

Population

<u>Yolo County</u>

Yolo County has a land area of 1,013.27 square miles with a population density of 166.5 persons per square mile (U.S. Census Bureau 2000). As of 2005, approximately 12 percent of the population lived in unincorporated areas of the county. Between 1990 and 2000, the county's population increased from 141,210 to 168,660, or 0.9 percent per year. Between 2000 and 2006, the population increased to 188,085 (U.S. Census Bureau Quick Facts), or 1.9 percent per year. The California Department of Finance (DOF) estimates Yolo County to have a population of 193,983 as of January 1, 2007, and population growth within the county is expected to continue, reaching 245,052 by 2020 and 327,982 by 2050, growing annually by 2 percent, and 1.1 percent, respectively.

Sutter County

Sutter County has a land area of 602.54 square miles with a population density of 130.9 persons per square mile (U.S. Census Bureau 2000). As of 2005, approximately 26 percent of the population lived in unincorporated areas of the county. Between 1990 and 2000, the county's population increased from 64,415 to 78,930, or 2.2 percent per year. Between 2000 and 2006, the population grew to 91,410 (U.S. Census Bureau Quick Facts). The DOF estimates Sutter County's population at 93,919 as of January 1, 2007, and population growth is expected to continue, reaching 141,159 by 2020 and 282,894 by 2050.

Sacramento County

Sacramento County has a land area of 965.65 square miles with a population density of 1,266.6 persons per square mile (U.S. Census Bureau 2000). As of 2005, approximately 34 percent of the population lived in unincorporated areas of the county. Between the years of 1990 and 2000, the population increased from 1,041,219 to 1,223,499. Between 2000 and 2006, the population increased to 1,374,724 (U.S. Census Bureau Quick Facts). Sacramento County has the highest population (at 1,387,771 as of January 1, 2007 as estimated by the DOF) relative to the other counties through which the proposed pipeline would be constructed.

Placer County

Placer County has a land area of 1,404.37 square miles with a population density of 179.9 persons per square mile (U.S. Census Bureau 2000). As of 2005, approximately 34 percent lived in unincorporated areas of the county. Between the years of 1990 and 2000, the population increased from 172,796 to 248,399. Between 2000 and 2006, the population grew to 326,242 (U.S. Census Bureau Quick Facts). The population of Placer County, as of January 1, 2007, was estimated by the DOF as 324,495 and is expected to grow to 428,535 by 2020 and 751,208 by 2050.

Table 4.12-1 shows population projections by county.

Table 4.12-1: Population Projections by County

County	2000	2010	2020	2030	2040	2050	Average Annual Growth Rate Percentage				
							2000 to 2010	2010 to 2020	2020 to 2030	2030 to 2040	2040 to 2050
Yolo County	170,190	206,100	245,052	275,360	301,934	327,982	2.1	1.9	1.2	1.0	0.9
Sutter County	79,632	102,326	141,159	182,401	229,620	282,894	2.8	3.8	2.9	2.6	2.3
Sacramento County	1,233,575	1,451,866	1,622,306	1,803,872	1,989,221	2,176,508	1.8	1.2	1.1	1.0	0.9
Placer County	252,223	347,543	428,535	512,509	625,964	751,208	3.8	2.3	2.0	2.2	2.0
Source: California Department of Finance 2004.											

Table 4.12-2: Projected Area Housing Units

County	2000 Census	2005 Estimate	Percentage Increase 2000 to 2005	Projections 2035
Yolo County	168,660	184,932	9.6	263,232
Sutter County	78,930	88,876	12.6	125,597
Sacramento County	1,223,499	1,363,482	11.4	1,933,026
Placer County	248,399	317,028	27.6	585,216
Sources: Sacramento Area Council of Demographics 2007, U.S. Census Bureau 2006.				

Housing

The availability of permanent and temporary housing varies along the proposed pipeline route. Within close proximity of the Project area, Woodland in Yolo County, Sacramento, Rio Linda and North Highlands in Sacramento County, and Roseville in Placer County are likely to have adequate hotel/motel space to accommodate temporary construction workers. Housing availability and types are provided in Table 4.12-2.

<u>Yolo County</u>

Yolo County has approximately 71,755 housing units with a 3.53 percent vacancy rate (DOF 2007). Approximately 57.69 percent of the units consist of single-family, detached housing. Multiple-family structures with five or more units account for approximately 23.53 percent of all housing, more than any other county within the Project area. Approximately 1,200 hotel rooms are available with high vacancy rates (PG&E 2007).

<u>Sutter County</u>

Sutter County has approximately 33,069 housing units with a 4.49 percent vacancy rate (DOF 2007). Approximately 73.42 percent of the units consist of single-family detached housing while multiple-family structures with five or more units account for approximately 11.97 percent. Approximately 958 hotel rooms are available with fairly high vacancy rates (PG&E 2007).

<u>Sacramento County</u>

Sacramento County has approximately 545,287 housing units with a 4.35 percent vacancy rate (DOF 2007). Approximately 64.33 percent of the units consist of single-family detached housing while multiple family structures with five or more units account for approximately 19.74 percent. Sacramento County has the highest amount of available hotel rooms at more than 10,000 but vacancy reduces availability to 1,500 rooms on peak nights. However, this reduced amount is still in excess of the total number of available hotel rooms located within the other three counties (PG&E 2007).

<u>Placer County</u>

Placer County has approximately 144,207 housing units with a 10.82 percent vacancy rate (DOF 2007). Approximately 77.99 percent, the highest out of the four counties, consist of single-family detached housing while multiple family structures with five or more units account for approximately 11.46 percent. Approximately 494 hotel rooms are available with high vacancy rates (PG&E 2007).

Public Services

Public services within the Project area include fire protection, police protection, public schools, hospitals, and convalescent homes. Below is a discussion of the existing public services within the Project area.

Fire Protection and Emergency Medical Services

<u>Yolo County</u>

Yolo County has 19 fire districts. The proposed Project lies within five of those districts: Elkhorn, Knights Landing, Yolo, Madison, and Esparto. Each district has one fire station. The Elkhorn Fire Department is located at 19396 County Road (CR) 124 in West Sacramento. The Knights Landing Fire Department is located at 42115 Sixth Street in Knights Landing. The Yolo Fire Protection District's headquarters are located at 37720 Sacramento Street in Yolo. The Madison Fire Department is located at 17880 Stephens Street in Madison. The Esparto Fire Protection District is headquartered at 16960 Yolo Avenue in Esparto. Each station is located within approximately 3 to 5 miles of the Project area, with the exception of the Yolo Fire Station, which is approximately 0.5 mile from the Project area, near the Interstate 5 (I-5) crossing. The majority of the personnel in each district are volunteers whose numbers fluctuate depending on the season.

<u>Sutter County</u>

Sutter County has six fire service districts. Of the six fire districts, the Sutter Basin Fire Protection District and County Service Area D are located within the Project area. The fire stations that are charged with responding to emergencies within the Project area are the Pleasant Grove Fire Department, located at 3100 Howsley Road in Pleasant Grove and the Robins-Sutter Basin Fire Department, located at 2340 California Street in Sutter. The Pleasant Grove Fire Department is staffed by volunteers on an on-call basis. The Robins-Sutter Basin Fire Department is staffed with three unit personnel, one engineer, one station captain, and approximately 12 volunteers. These two Fire Departments are approximately 5 and 10 miles away from the pipeline, respectively. All Sutter County fire districts are able to provide medical aid at the basic life support level with the ability to perform emergency cardiac shock (defibrillation). County Service Area F has a Hazardous Materials Response Team, which includes equipment and personnel trained to mitigate hazardous materials releases. Although not stationed in the immediate Project area, this team would respond to any hazardous material incident in the Project area.

Sacramento County

Sacramento County's northwestern boundary lies approximately 1.25 miles to the south of the proposed Line 407 East. The proposed Powerline Road DFM extends south from the junction of Line 407 East and Line 407 West approximately 2 miles into the northwestern corner of Sacramento County. The Sacramento Fire Department, comprising 25 stations, serves this area. The DFM is approximately 4.5 miles from the Natomas Fire District's Station Number 3, located at 7280 West Elkhorn Boulevard. Station Number 3 is responsible for first response in the Powerline Road DFM Project area and is generally staffed by three to four personnel members at any given time (Melton 2008).

Placer County

Approximately 6.25 miles of Line 407 East extends into the southwestern portion of Placer County. This area is part of the Dry Creek Fire Service area and is served by the Placer County Fire Department. The Cook Riolo Station, which is the nearest to the Project area, is located approximately 1 mile to the east. This station has two fire captains, one full-time firefighter-engineer, one part-time firefighter-engineer, 2.33 full-time firefighters, and one part-time firefighter (Brooks 2008).

Police Protection

Yolo County

The unincorporated areas of Yolo County are served by the Yolo County Sheriff's Department which is divided into three major divisions: Administrative and Support Services, Detention Services, and Field Operations. The Department has 276 employees of which 95 are sworn personnel (Yolo County Sheriff's Department 2008). The closest station is located approximately 6 miles south of the Line 407 West Project area, within the City of Woodland at 2500 East Gibson Road.

Sutter County

The unincorporated areas of Sutter County are served by the Sutter County Sheriff's Department consisting of 57 sworn personnel. The department is headquartered at 1077 Civic Center Boulevard in Yuba City, approximately 30 miles north of the Project site. Two additional substations are located in Live Oak and Sutter and are 29.5 and 37 miles from the Project, respectively.

Sacramento County

The unincorporated areas of Sacramento County are served by the Sacramento County Sheriff Department. The department headquarters are located at 711 G Street in downtown Sacramento. Of the 11 substations in the county, the nearest substation to the Powerline Road DFM is the Northwest Service Center located at 7511 Watt Avenue, approximately 11 miles east of the Project area. The Northwest Division has 76 sworn officers and is broken down into five zones, with zone 1 covering the Project area. In addition, the Sacramento International Airport has Sheriffs on patrol 24 hours a day and is located directly south of the DFM.

Placer County

The unincorporated areas of Placer County are served by the Placer County Sheriff's Department. The Department is headquartered in the City of Auburn at 2929 Richardson Drive with two additional substations and service centers located throughout the county. The South Placer Substation in Loomis is responsible for servicing the eastern most extent of the Project area and is located at 6140 Horseshoe Bar Road, approximately 12 miles northeast of the Project site. The Substation is staffed by approximately 50 personal including 33 patrol positions. The West Roseville/Dry creek area, which covers the Project area, has a patrol officer on duty 24 hours a day.

California Highway Patrol

Yolo, Sutter, Sacramento, and Placer counties are served by the California Highway Patrol's Valley Division. The Valley Division has 16 area offices, and 785 uniformed officers. The CHP's Valley Division oversees all State and county roads within the Project area. The Area Office closest to the Project area is located in Woodland at 1975 Wintun Drive, approximately 4.5 miles south of the proposed alignment.

Schools

The following information regarding schools in the Project areas is provided by the district and school websites as well as data compiled by the California Department of Education as found on the Ed-Data website. Distance from the proposed alignment to schools in the project vicinity are provided below. These distance are not provided to respond to specific significance criteria in this Section, but are provided for general reference for schools along the proposed alignment.

Yolo County

Yolo County has five school districts and one countywide special education program. Of the county's five school districts, two serve the Project area and are described here. The Esparto Unified School District operates one elementary, one junior high and two high schools. Approximately 1,036 students are enrolled in the district. The Woodland Joint Unified School District operates 12 elementary, two junior high, and three high schools. In addition, two community day schools are overseen by the district. In total, approximately 10,690 students are served by this district. Within the town of Yolo, there are several schools within 0.5 mile of the pipeline route. The closest is an existing school with elementary through high school grades to the south of the Line 407 alignment. The existing Cache Creek High School is at the intersection of Clay Street and 2nd Street and is approximately 0.77 mile south of the pipeline alignment and 0.8 mile southeast of the proposed Yolo Junction Pressure Limiting Station along Line 172A.

Sutter County

Sutter County is served by 10 elementary school districts and 4 high school districts. The Marcum-Illinois Union and Pleasant Grove Elementary Districts, along with the East Nicolaus Joint Union High School District, serve the Project area. Both elementary districts consist of one school each and combined serve approximately 1,111 K-8 students. The East Nicolaus District consists of one high school and one continuation school, which combined serve approximately 332 students. No schools are located within 0.5 mile of the Project area in Sutter County.

Sacramento County

Sacramento County is served by 16 public school districts, one of which, Natomas Unified School District, serves the Project area. The district consists of eight elementary schools, two middle schools, three high schools, three charter schools and one continuation school. Combined, these schools serve approximately 10,821 students. There are no schools within 0.5 mile of the Project area in Sacramento County.

Placer County

Placer County is served by 17 primary and secondary education school districts, of which, two serve the Project area. The Dry Creek Elementary School District is comprised of six elementary schools and two middle schools that combined serve approximately 7,377 students. The Roseville Joint Union High School District consists of six high schools, enrolling approximately 8,918 students. In Placer County there are two schools within 0.5 mile of the proposed Project; the Alpha School (historical) is approximately 0.5 mile north of Line 407 along Baseline Road, and the Coyote Ridge Elementary School is approximately 0.4 mile north-northeast of the eastern terminus of Line 407 at the intersection of Baseline Road and Fair Oaks Boulevard.

Hospitals and Convalescent Homes

The two closest emergency medical facilities to the Project area are Woodland Memorial Hospital in Woodland, approximately 5.5 miles from the west end of Line 407 West, and Sutter Roseville Medical Center in Roseville, approximately 5.8 miles from the east end of Line 407 East. Both Woodland and Roseville have several other healthcare facilities, including hospitals and convalescent homes, located within their city boundaries. No hospitals, convalescent homes, or medical centers are within 0.5 mile of the Project area.

Parks and Recreation

The majority of the land through which the Project traverses is privately owned and is used for agricultural purposes. The proposed pipeline would travel through the Yolo Bypass Wildlife Area, Sacramento River Ranch Conservation Bank, and the Huffman East, Huffman West, Vestal and Atkinson Natomas Basin Habitat Conservation tracts, as well as under the Sacramento River. Both the Sacramento River and Yolo Bypass Wildlife Area offer recreational opportunities including, but not limited to, hiking, fishing, birding, and boating. See Section 4.11, Recreation, for more information.

Utilities

Public utilities services within the Project area include electricity and natural gas, water and wastewater, solid waste and recycling and telephone, internet and cable television. Below is a discussion of the existing public services within the Project area.

Electricity and Natural gas

PG&E provides electric power and natural gas to Yolo, Sutter and most of Placer counties. Sacramento County, as well as a small portion of Placer County, is provided with electricity by the Sacramento Municipal Utility District (SMUD). Within Placer County, the City of Roseville receives electricity from Roseville Electric, which serves approximately 41,883 residential and 5,410 commercial customers within the city limits.

Service Systems

Water and Wastewater

Yolo County

Yolo County is served by several water districts, including the Yolo County Flood Control and Water Conservation District (YCFCWCD), North Delta Water Agency, Yolo-Zamora Water District, Dunnigan Water District, and various smaller reclamation districts. A majority of the Project area in Yolo County falls within the YCFCWCD service area, which covers 195,000 acres of Yolo County, including the cities of Woodland, Davis, and Winters, and the towns of Capay, Esparto, Madison, and other small communities within the Capay Valley.

The YCFCWCD manages more than 150 miles of canals and laterals, three dams, two reservoirs, and a small hydroelectric plant. The YCFCWCD's water supply includes surface water from Clear Lake, Indian Valley, and Cache Creek, and groundwater recharged by the YCFCWCD's operations. Residences in unincorporated areas of the county, including the Project area, may also use private wells as their primary source of water. Sewer services are not provided in the Project area in Yolo County and sewage disposal is limited to individual septic systems.

Sutter County

Sutter County's Environmental Health Services, under the Community Services Department, is responsible for water and wastewater including onsite sewage disposal, water wells and well monitoring (Sutter County 1996).

Much of the unincorporated areas of Sutter County utilize private wells and septic tanks for their water and sewage needs. The Town of Robbins, in the southwestern area of the county, is the only town that has its own water district (PG&E 2007).

Sacramento County

Within Sacramento County, there are 28 water purveyors responsible for treating and distributing surface and groundwater as well as securing surface water rights (Sacramento County General Plan). The Sacramento County Department of Water Resources (SCDWR), within Sacramento County's Municipal Services Agency, manages surface water and groundwater resources via the Sacramento County Water Agency (SCWA). The SCWA is responsible for providing water to all areas not served by one of the purveyors. The SCDWR provides services such as drainage, flood control, and water supply to various areas in unincorporated Sacramento County. In addition to the SCDWR, more than 20 public and private water districts provide water supply service in unincorporated areas of Sacramento County. The Natomas Central Mutual Water Company is the primary irrigation water supplier within the Powerline Road DFM Project area.

The Sacramento Regional County Sanitation District (SRCSD) and County Sanitation District 1 (CSD-1) provide sanitary sewer and wastewater collection, conveyance, and treatment services within the developed areas of Sacramento County. Wastewater from unincorporated areas of Sacramento County is conveyed to the Sacramento Regional Wastewater Treatment Plant in Elk Grove, which is owned and operated by the SRCSD In addition, the SRCSD provides treatment services for a small number of residential customers in Roseville and south Placer County. CSD-1 also serves unincorporated areas of Sacramento County.

Placer County

The Placer County Water Agency (PCWA) encompasses the entire, 1,500-square-mile boundary of Placer County and carries out a broad range of responsibility including, but not limited to, water resource planning and management, retail and wholesale supply of irrigation water and drinking water and production of hydroelectric energy (Placer County General Plan 1994). The PCWA operates an extensive raw water distribution system that includes 165 miles of canals, ditches, flumes, and several small reservoirs. Drinking water is produced through a network of eight water treatment plants. A significant amount of PCWA raw water irrigates agricultural land and golf courses. Placer County provides sewer services to incorporated areas of the County, as well as some areas just outside of city limits. Private septic systems are used in the Project area, which lies in unincorporated Placer County.

Solid Waste and Recycling Service

Solid waste and recycling services for the Project area are discussed below. A summary of landfill capacity is provided in Table 4.12-3.

Yolo County

Waste Management, Inc. is a private company that is contracted with Yolo County and a majority of the cities within Yolo County to provide garbage and recycling collection and disposal services. There are two landfills in the county: the Yolo County Central Landfill, and the University of California, Davis Landfill, which serves the University. A transfer station is located in Esparto. The Yolo County Central Landfill is located northeast of Davis at CR 28H and CR 104 on 724 acres of which 473 acres are used for waste disposal. This landfill is permitted to accept 1,800 tons of solid waste per day and has an estimated remaining capacity of 16,122,000 cubic yards or 64 percent (CIWMB 2008).

Sutter County

Yuba-Sutter Disposal, Inc., a subsidiary of Norcal Waste Systems, Inc., provides recycling and solid waste collection services to residential and commercial customers in Live Oak, Marysville, Wheatland, Knights Landing, Yuba City, Beale Air Force Base, and the counties of Yuba and Sutter. Additionally, the company operates two transfer stations, a materials recovery facility, one household hazardous waste collection facility, one buy-back center, and a composting facility. (Yuba-Sutter Disposal, Inc. 2008). Yuba-Sutter Disposal, Inc. serves more than 30,000 residential customers and 5,000 commercial customers, and collects more than 100,000 tons of materials annually within their service area.

Solid waste collected by Yuba-Sutter Disposal, Inc. is brought to Norcal Waste Systems' Ostrom Road Landfill, Inc., located in Yuba County at 5900 Ostrom Road in Wheatland. The Ostrom Road Landfill provides solid waste disposal services to municipal and commercial customers in the northern Sacramento Valley including Sutter County. The site comprises 261 acres, 225 of which are permitted as a Class II Landfill (Norcal Waste Systems Ostrom Road Land Fill, Inc.). This landfill is permitted to accept 3,000 tons of solid waste per day and has an estimated remaining capacity of 40,600,000 cubic yards or 97 percent (CIWMB 2008).

Sacramento County

Sacramento County's Department of Waste Management & Recycling provides waste management for residents and businesses in the northern unincorporated areas of the county. Residents living in the unincorporated areas of the county south of Calvine Road receive waste management and recycling services provided by Central Valley Waste Services, a private waste-hauling firm under contract with

Sacramento County. The Sacramento County Landfill (also referred to as the Kiefer Landfill) is the primary municipal solid waste disposal facility in Sacramento County, and is the only landfill facility in Sacramento County permitted to accept household waste from the public. Kiefer Landfill is located at 12701 Kiefer Boulevard in Slough house. This landfill is permitted to accept 10,815 tons of solid waste per day and has an estimated remaining capacity of 112,900,000 cubic yards or 96 percent. It is located on 1,084 acres of which 660 acres are used for waste disposal (CIWMB 2008).

Placer County

Placer County contracts waste collection and recycling services for unincorporated areas from two separate companies. Tahoe Truckee Sierra Disposal, who also manages the Eastern Regional Materials Recovery Facility, services the eastern portion of the county and directs waste to the Lockwood Landfill in Nevada. Auburn Placer Disposal Service provides waste removal services for the western portion of the County via three transfer stations. Waste from the western portion of the county, which would include the proposed Project, is directed to the Western Regional Landfill (Placer County 2008). The Western Regional Landfill is permitted to accept 1,900 tons of solid waste per day and has an estimated remaining capacity of 29,093,819 cubic yards or 80 percent. It is located on 281 acres of which 231 acres are used for waste disposal (CIWMB 2008).

Table 4.12-3: Landfill Capacity

County	Landfill	Maximum Permitted Capacity (Cubic Yards)	Remaining Capacity (Cubic Yards)	Capacity Available (Percent
Yolo	Yolo County Central Landfill	25,000,000	16,122,000	64
Sutter	Ostrom Road Landfill (located in Yuba County)	41,822,300	40,600,000	97
Sacramento	Sacramento County Landfill (Kiefer Landfill)	117,400,000	112,900,000	96
Placer	Western Regional Landfill	36,350,000	29,093,819	80
Source: California Integrated Waste Management. Facility/Site Summary Details (SWIS) Online: http://www.ciwmb.ca.gov/SWIS/Search.asp (Accessed May 20, 2008).				

Telephone, Internet, and Cable Television

Telephone service in the Project area is provided by AT&T (also known as SBC, Bell South, and SBC Pacific Bell), and SureWest. SureWest also provides internet and cable services within the Project area, as does Comcast.

4.12.2 Regulatory Setting

Federal

The U.S. Department of Transportation (DOT) establishes the “Transportation of Natural Gas by Pipeline: Minimum Federal Safety Standards” as required by 49 Code of Federal Regulations 192. These standards specify minimum safety requirements for pipeline facilities and transportation of gas via pipeline. The standards in the Federal regulations are more stringent for pipelines placed near high human population densities. Federal DOT regulations define area classifications, based on population density of the pipeline vicinity and on an area that extends for 660 feet (220 yards) on either side of the centerline of any continuous one-mile length of the pipeline. Class locations representing more populated areas require higher safety factors in pipeline design, testing, and operation. In addition to population density, other factors are used to determine the design factor used within a class location. A higher safety factor must be used in the design formula for steel pipelines that: (a) cross the ROW of an unimproved public road, without a casing; or (b) cross without a casing, or makes a parallel encroachment on the ROW of a hard-surfaced road, a highway, a public street, or a railroad. The design specifications for each of the pipeline area classes included as part of the Project are provided in Section 2.0, Project Description, Table 2-2. Section 2.0, Project Description, Figure 2-7 illustrates the pipeline area classifications along the proposed route. Section 4.7, Hazards and Hazardous Materials, also has more information on Federal DOT regulations.

State

Assembly Bill 939

Assembly Bill 939 (AB 939), enacted in 1989, required each city and/or county’s Source Reduction and Recycling Element to include an implementation schedule for the following: a 25 percent diversion of all solid waste from landfill disposal or transformation by January 1, 1995, through source reduction, recycling, and composting activities, followed by a 50 percent reduction to the waste stream by

January 1, 2000. The diversion rates for the counties through which the pipeline would traverse are included in Table 4.12-4

Table 4.12-4: Waste Diversion Rates

County	Unincorporated Area Diversion Rate Percentage	
	2005	**2006**
Yolo	67	71
Sutter	63[1]	65[1]
Sacramento	59[2]	56[2]
Placer	56	55

Footnotes:
[1] The Yuba/Sutter Regional Waste Management Authority is the only reporting waste diversion jurisdiction in Sutter County and does not report separate diversion rates for unincorporated areas within the county.
[2] Unincorporated area diversion rates in Sacramento County include the City of Citrus Heights.
Source: California Integrated Waste Management Board, Countywide, Region wide, and Statewide Jurisdiction Diversion Progress Report. http://www.ciwmb.ca.gov/LGTools/mars/jurdrsta.asp. (Accessed May 14, 2008).

Local

Because the California Public Utilities Commission has exclusive jurisdiction over the design, location, construction, and operation of gas transmission facilities owned and operated by investor-owned public utilities, PG&E is not subject to local ordinances and regulations. Nonetheless, as part of its environmental review under the California Environmental Quality Act (CEQA), the following local regulations and policies have been considered in the assessment of impacts on population and housing, public services, utilities and other service systems.

Yolo County

The following goals, objectives, and policies regarding public services from the Yolo County General Plan were considered:

> **Policy S 14. Fire, Basic:** Yolo County shall cooperate with the fire districts, enforce planning, zoning, and building codes and advise and encourage development to enhance fire safety.

> **Policy S 17. Crime Protection and Avoidance:** Yolo County shall develop standards for location, construction, and operation of new development and

redevelopment to enhance public protection from crime and to avoid generating facilities conducive to crime.

Sutter County

The following goals, objectives, and policies regarding public services from the Sutter County General Plan were considered:

Policy 3.F-1: The County shall maintain a sheriff force to protect the citizens and property within Sutter County.

Goal 3.G: To minimize the risk of personal injury and property damage resulting from fire and provide for emergency medical response when, and to the extent, determined appropriate by the governing body.

Policy 3.G-2: The County will strive to ensure that all proposed development applications are reviewed for compliance with adopted fire safety standards.

Policy 7.D-2: The County shall require that new development, at a minimum, meets state standards for fire protection.

Sacramento County

The following goals, objectives, and policies regarding utilities and service systems from the Sacramento County General Plan were considered:

Public Facilities Element

Section VI: Sheriff

Objective: Provide law enforcement services to the unincorporated area in accord with a commitment of crime prevention, control, and correction.

Section VII: Fire Protection and Emergency Services

Goal: Efficient and effective fire protection and emergency response serving existing and new development.

Policy PF-62: New development shall provide access arrangements pursuant to the requirements of the Uniform Fire Code.

Section VIII: Energy Facilities

Objective: Minimize the health, safety, aesthetic, cultural, and biological impacts of energy facilities in Sacramento County.

Objective: Distribute natural gas safely and efficiently, and withdraw underground gas reserves in an environmentally sensitive manner.

Policy PF-118: Route new high-pressure gas mains within railway and electric transmission corridors, and along collector roads, and wherever possible, within existing easements. If not feasible these gas mains shall be placed as close to the easement as possible.

<u>Housing Element</u>

Goal: Promote an adequate supply of decent, safe, and affordable housing to meet the needs of all residents in Sacramento County without regard to race, color, age, sex, religion, natural origin, family status or disability.

Policy HE-1: The County shall maintain an adequate supply of residential and agricultural-residential zoned land to accommodate projected housing needs.

Policy HE-45: When feasible, integrate housing with compatible non-residential uses in an effort to located affordable housing near employment opportunities.

Policy HE-48: Support alternative living arrangement that provides affordability; especially for singles and the elderly.

Placer County

The following goals, objectives, and policies regarding public services from the Placer County General Plan were considered:

Goal 4.H: To provide adequate sheriff's services to deter crime and to meet the growing demand for services associated with increasing population and commercial/industrial development in the County.

Policy 4.H.2: The County Sheriff shall strive to maintain the following average response times for emergency calls for service: a. 6 minutes in urban areas; b. 8 minutes in suburban areas; c. 15 minutes in rural areas; d. 20 minutes in remote rural areas.

Policy 4.H.4: The County shall require new development to develop or fund sheriff facilities that, at a minimum, maintain the above standards.

Goal 4.I: To protect residents of and visitors to Placer County from injury and loss of life and to protect property and watershed resources from fires.

Policy 4.I.2: The County shall encourage local fire protection agencies in the County to maintain the following standards (expressed as average response times to emergency calls): a. 4 minutes in urban areas; b. 6 minutes in suburban areas; c. 10 minutes in rural areas.

Policy 4.I.3: The County shall require new development to develop or fund fire protection facilities, personnel, and operations and maintenance that, at a minimum, maintains the above service level standards.

Policy 4.I.9: The County shall ensure that all proposed developments are reviewed for compliance with fire safety standards by responsible local fire agencies per the Uniform Fire Code and other County and local ordinances.

City of Roseville

The following goals, objectives, and policies regarding utilities and service systems from the City of Roseville General Plan were considered:

<u>Public Facilities Element</u>

Privately-Owned Utilities Goal 1: Work with privately-owned utility companies to ensure adequate service is provided in a timely manner for Roseville customers.

Policy 1: Provide for the review and comment of development proposals by non-City-owned utilities.

Policy 3: Require the provision of necessary utility easements in all new developments.

Policy 4: Work with non-City-owned utility providers to insure that uses and equipment are planned and constructed in a manner consistent with adopted land use policies and design guidelines, to the extent feasible.

<u>Land Use Element</u>

Policy 2.D: Develop design guidelines, specifying screening and a transition between public utilities (e.g. substations, pump stations) and other uses, in conjunction with the public utility departments and agencies. In addition,

development along power line and pipeline easements shall incorporate design treatment to insure compatibility and safety. Design guidelines and treatment may include minimum setbacks, building and landscape design standards and possible limitations on certain types of uses and activities.

4.12.3 Significance Criteria

An adverse impact to population and housing, public services, and utilities and service systems is considered significant and would require mitigation if Project construction or operation would:

1. Cause the vacancy rate for temporary housing to fall to less than 5 percent;
2. Increase the short- or long-term demand for public services, utilities, or service systems in excess of existing and projected capacities;
3. Cause a permanent population increase of 3 percent or more in a county affected by the Project; or
4. Displace a large number of people.

4.12.4 Applicant Proposed Measures

No APMs have been identified for population and housing, public services, or utilities and services systems.

4.12.5 Impact Analysis and Mitigation

Impact Discussion

The proposed Project would add a new major connection point to the existing Lines 400 and 401 and create a connection between the lower Sacramento Valley's natural gas transmission system and PG&E's backbone natural gas transmission system. Additionally, the Project would connect to existing Line 172 and Line 123 to further reinforce the reliability of the region's natural gas system by providing a second large-diameter connection point between Lines 400 and 401 and existing pipelines serving the greater Sacramento Valley region. The purpose of this Project is to support existing and approved future planned population growth in the Project area and would not directly or indirectly increase population in the Project area. Effects on the Project area's population and housing, public services, or utilities and service systems would coincide with the construction of the pipeline and would therefore be temporary.

Vacancy Rate

The Project would not cause the vacancy rate for temporary housing to fall to less than 5 percent. Pipeline construction would require 90 to 130 workers, 75 to 100 of which would typically be non-PG&E contract employees, 5 to 15 would be from PG&E's labor force and 10 to 15 would be contract inspectors. PG&E expects that construction personnel would come from the existing labor pool in the Project vicinity. These workers would be dispersed over several construction sites spread across the 40-mile pipeline Project. A maximum of approximately 90 workers would be onsite at any given time and would congregate at the same location only during the beginning or end of the workday. Construction is expected to last approximately ten months total over several phases.

Should these workers need temporary housing during the 10-month construction period, an ample number of hotels and motels are available near the Project area. Approximately ten lodging establishments are located in Woodland and are within a reasonable driving distance to the western portion of the pipeline. The Best Western Shadow Inn, located at 584 North East Street in Woodland, approximately 2.75 miles south of the proposed pipeline, reported that weekday vacancy rates are typically high but during weekends vacancy rates lower substantially. Within Natomas, a portion of northern Sacramento, ten hotels are within reasonable driving distance of the eastern portion of the pipeline. The Holiday Inn Express, located at 2981 Advantage Lane in Natomas, approximately 4 miles south of the proposed pipeline, reported that weekday vacancy rates usually fluctuate between 45 and 75 percent with periods of no vacancy depending on regional events. A representative at the Holiday Inn Express indicated that during times of large construction projects, such as the recent Fix-I-5 project in Downtown Sacramento, hotels in the area work together to accommodate demand. Construction of the Project may affect the overall availability of temporary housing. However, due to the short duration of the Project and the large number of hotels in close proximity to the proposed alignment, the Project would not cause the vacancy rate for temporary housing to fall below 5 percent. Therefore, impacts would be less than significant (Class III).

Increase Demand for Public Services in Excess of Capacities

The Project would not increase the short- or long-term demand for public services, utilities, or service systems in excess of existing and projected capacities. Increase in demand for public services, utilities, or services systems is generally related to population growth. Since the proposed Project would not result in any permanent population growth, the demand for such services would not increase. Therefore, the proposed Project would not create long-term increased demand for such services or necessitate the construction of additional related facilities. Impacts would be less than significant (Class III).

While the operation and maintenance of the Project would not result in an increased demand in excess of public service capacities, minor short-term effects would occur. These effects are discussed below.

Services

Fire Protection, Emergency Medical Services and Police Protection

Fire protection and emergency medical services would be provided by Elkhorn, Knights Landing, Yolo, Madison, and Esparto Fire Stations in Yolo County; Sutter Basin Fire Protection District and County Service Area D in Sutter County; Sacramento Fire Department's Station Number Three in Sacramento County; and the Cook Riolo station in the Dry Creek Fire Service of the Placer County Fire Department. Police protection services would be provided by the Yolo, Sutter, Sacramento and Placer county Sheriff's Departments. Additionally, the CHP's Valley Division patrols all State and county roads within the Project area. Increases in demand for such services are generally associated with population growth. Since both Project construction and operation are not expected to directly or indirectly induce substantial population growth, demand for police protection services would not be expected to increase.

Minor impacts to police response times could be affected indirectly as a result of traffic associated with construction of the Project. Refer to Section 4.13, Transportation and Traffic, for further discussion. Routes for emergency vehicles would be maintained throughout Project construction areas to the maximum extent feasible. Roadway closures would be coordinated with emergency service providers as directed by the TMP for the Project (see Applicant Proposed Measure 15-3 in Section 4.13, Transportation and Traffic). At least one travel lane would be kept open in areas where the pipeline crosses roadways during construction. Increases in demand for such services are generally associated with population growth. Since both Project construction and operation are not expected to directly or indirectly induce substantial population growth, demand for fire protection and emergency medical services would not be expected to increase. Therefore, the proposed Project would not create a permanent increased demand for such services or necessitate the construction of additional related facilities. Because the majority of the fire stations which serve the proposed pipeline are staffed by volunteer fire fighters, response times may be longer than those from fully staffed fire stations. As such, response times to emergencies along the pipeline may be slightly longer.

A Fire Risk and Management Plan would be prepared by PG&E prior to Project construction (see Applicant Proposed Measure 8-6 in Section 4.7, Hazards and Hazardous Materials). The Plan would describe the potential for fire to occur as a result of Project construction and would also describe measures necessary to prevent fires.

According to the Climate Action Team of California, wildfires are likely to increase in the future, especially as warming intensifies (CEPA 2006). An increase in temperatures and decrease in annual rainfall would create conditions along the proposed pipeline that are increasingly prone to fire hazards. Furthermore, the fires may be greater in magnitude, frequency, and duration. Applicant Proposed Measures and/or Mitigation Measures identified in Section 4.7, Hazards and Hazardous Materials, would ensure that construction activities that my cause wildfire be reduced to a less than significant level (Class III).

Implementation of the Fire Risk and Management Plan would ensure that impacts related to fire protection and emergency medical services would be reduced to less than significant (Class III).

<u>Schools, Parks and Recreation</u>

Because Project construction and operation would not result in growth-inducing impacts, it would not increase demand or create a need for new facilities such as schools, parks, or recreation areas.

Additionally, short-term impacts during Project construction would not result in significant population growth or reduce the number of such facilities currently available. While the pipeline would cross recreational areas such as the Sacramento River, Yolo Bypass Wildlife Area, Sacramento River Ranch Conservation Bank, and several Natomas Basin Habitat Conservation tracts, these areas would remain open to regular recreational use during temporary Project construction and would be returned to previous conditions upon Project completion (Refer to Section 4.13, Recreation, for more information). Therefore, no new parks or public facilities would be needed and impacts would be less than significant (Class III).

Utilities and Service Systems

Project construction would not increase the demand or reduce the availability of utilities within the Project area. Operation of the pipeline would not create an increase in population and, therefore, would not increase demand or change existing levels of utility services. PG&E's projections for their 10-year investment plan assume an additional 19,890 customers in an area where they are currently serving 675,000 customers. This represents a projected increase of 2.9 percent. However, this figure is substantially less than the estimated population growth (see Table 4.12-2) for the counties where the proposed Project would be located. The proposed Project would accommodate anticipated future population growth, but would not be growth inducing. Operation and maintenance of the Project would not result in significant impacts to utilities.

While the operation and maintenance of the Project would not result in an increased demand in excess of utility and service system capacities, minor short-term effects would occur. These effects are discussed below.

<u>Electricity and Natural Gas</u>

Electricity for lighting during construction would be powered by a diesel generator. At the 12 locations along the proposed pipeline where HDD would be implemented, lighting would be utilized to allow continuous, 24-hour construction operations. A temporary light plant would be stationed at the entry and exit points of each HDD section and would consist of four 1,000-watt fixtures.

During operation, the proposed Project would require minimal amounts of energy usage for the lighting located at the pressure limiting, pressure regulating, and metering stations. This lighting would only be used in emergency situations. Therefore, neither construction nor operation of the Project would increase short-term or long-term demand for electricity. Impacts to electricity would be less than significant (Class III).

The nature of this Project serves to increase natural gas infrastructure to the Northern Central Valley. Should this Project not be implemented, shortages in the delivery capability of the existing pipeline infrastructure could occur as early as 2009. Construction and operation of the proposed Project would not increase short-term demand for natural gas, but is intended to accommodate projected future demand. As such, impacts would be beneficial (Class IV).

Water and Wastewater

The proposed Project would not result in any structure requiring the permanent use of water and therefore, no wastewater would be created. However, pipeline construction water usage would include hydrostatic testing and dust control. Water for hydrostatic testing would be obtained from local agricultural wells, while water for dust control would be obtained from local agricultural wells and canals. The exact source of such water has not yet been determined but would be based on the availability and capacity of the water systems in the Project vicinity. Water quality would be measured from the water source prior to use and after use to assure that water quality is not compromised.

Overall, hydrostatic testing would use approximately 7.26 million gallons of water (22.3 acre feet). Specific locations for the discharge of hydrostatic test water have not yet been determined. Where possible, the test water would be discharged into trucks and used for dust control. When use of the water as dust control is not practical, the water would be discharged over land, in agricultural drain ditches or storm drains, or in sanitary sewers per local permits and ordinances. Such discharges would use a flow manifold and energy dissipater to control the rate of discharge and to minimize erosion and turbidity to meet the standards set forth under the terms and conditions of the National Pollutant Discharge Elimination System (NPDES) permit and the General Order for Dewatering and Other Low Threat Discharges to Surface Waters, issued by the Central Valley Regional Water Quality Control Board (CVRWQCB). Occurrences of water discharge from hydrostatic testing would be limited to the period of construction. Impacts would be less than significant (Class III).

Solid Waste and Recycling Service

Operation of the proposed Project would not produce any solid waste. Construction activities are expected to produce a small amount of construction-related waste that would not adversely affect landfills near the Project area. An approximation of the amount of waste resulting from Project construction is not yet known. PG&E would implement solid waste management BMP 2-04 that would insure the proper disposal and waste diversion measures are completed to the maximum extent feasible. BMP 2-04 contains provisions for site housekeeping, onsite water storage areas, and drainage management. Local landfills, which have adequate capacity as demonstrated in Table 4.12-3, would likely be the location of waste disposal. As such, short-term impacts to waste and recycling services would not be in excess of existing capacities. Impact would be less than significant (Class III).

<u>Underground Utility Lines and/or Facilities</u>

Construction and operation of this Project would not require the use of existing underground utility lines and or facilities other than those owned by PG&E and connected to the proposed pipeline. The Project would not increase the short- or long-term demand for existing underground utility lines or facilities in excess of their existing and projected capacities. Impacts in this respect would be less than significant (Class III).

Activities taking place during construction of the proposed Project could inadvertently contact other underground utility lines or facilities, possibly leading to short-term service interruptions. However, utilization of the Underground Service Alert system would notify PG&E of any underground utilities in the vicinity. Parties responsible for other utilities within the Project area would either mark or stake the location of such facilities. This standard practice would reduce possible short-term impacts to a less than significant level (Class III).

Population Increase

Impacts on the Project vicinity's population are expected to be temporary and relatively small in comparison to the populations of the affected counties. Due to the short duration of the Project, it is not expected that temporary workers would relocate their families. The estimated 90 to 130 workers that are expected to work on the proposed Project would not result in a significant impact related to population growth in Yolo, Sutter, Sacramento, or Placer counties. Operation of the completed pipeline would not require full-time personnel. PG&E employees who are presently responsible for the many existing PG&E facilities in the Project vicinity would perform regular maintenance of the proposed pipeline and no new employees would be required. Therefore, impacts would be less than significant (Class III).

The proposed Project is designed to increase the supply and stability to the existing gas transmission infrastructure and would not directly connect to homes or businesses. The proposed pipeline is intended to increase infrastructure that would serve existing and future planned population growth within the Project area. PG&E's projections for their 10-year investment plan assume an additional 19,890 customers in an area where they are currently serving 675,000 customers. This represents a projected increase of 2.9 percent. However, this figure is substantially less than the estimated population growth (see Table 4.12-2) for the counties where the proposed Project would be located. Since PG&E has an obligation to serve public utility needs, and the Project accommodates existing and approved growth, the Project would not directly induce population growth. No significant permanent impacts to population are expected to occur as a direct result of this Project. The temporary relocation of construction workers would not cause a permanent population increase of 3 percent or more in affected counties. Impacts would be less than significant (Class III).

Displace People

The Project would not displace a large number of people. Construction personnel from outside the local area are expected to utilize temporary housing such as hotels, motels, apartments and campgrounds. Table 4.12-3 summarizes the Project area's housing and vacancy rates. Total housing units in each county range between 33,069 in Sutter County and 545,287 in Sacramento County. Vacancy rates range between 3.53 percent in Yolo County and 10.82 percent in Placer County. While construction personnel may temporarily rent housing units, it is more likely that short-term housing, such as hotels and motels, would be used. The number of local hotels and motels range from 494 in Placer County to more than 10,000 in Sacramento County. Vacancy rates in Yolo, Sutter, and Placer Counties are typically high. Periods of low vacancy rates in Sacramento County could reduce the number of available rooms to below 1,000. However, this remaining availability is still above both Sutter and Placer counties' total rooms. According to previous PG&E pipeline construction documentation, approximately 30 percent of out-of-area workers would provide their own housing in the form of travel trailers or other recreation vehicles. After completion of the pipeline, no new employees would be required for maintenance or operation.

Therefore, the proposed Project would not result in the destruction or relocation of any housing. The proposed alignment would utilize county roads, farm roads, agricultural fields and other ROWs to the maximum extent feasible and would therefore not result in the displacement of people, housing or businesses. As such, impact would be less than significant (Class III).

4.12.6 Impacts of Alternatives

A No Project Alternative as well as twelve options have been proposed for the alignment in order to minimize or eliminate environmental impacts of the proposed Project and to respond to comments from nearby landowners. The twelve options, labeled A through L, have been analyzed in comparison to the portion of the proposed route that has been avoided as a result of the option. Descriptions of the options can be found in Section 3.0, Alternatives and Cumulative Projects, and are depicted in Figure 3-2A through 3-2K.

No Project Alternative

Under the No Project Alternative, a natural gas pipeline would not be constructed. As such, this alternative would cause no impacts to population, housing, public services, utilities or service systems.

Option A

Option A is located approximately 1.3 miles to the north of the proposed alignment and would lengthen the pipeline by 2,200 feet. Similar to the proposed Project, Option A would not result in permanent relocation of construction workers. Also similar to the proposed Project, the maximum number of on-site workers required to construct Option A would not exceed 90 at any given time. As such, Option A would require the same amount of temporary housing as the proposed Project and would result in less than significant impacts (Class III) to local vacancy rates. Option A would not result in the destruction or relocation of any housing or displace a large number of people.

Similar to the proposed project, Option A would not result in population growth and therefore would have less than significant (Class III) impacts to public services. Similar to the proposed project, impacts to utilities and service systems such as electricity, natural gas, water, wastewater, solid waste, recycling or underground utility lines and facilities would be less than significant (Class III).

Option B

Option B is located approximately 1.3 miles to the north of the proposed alignment and would lengthen the pipeline by 2,640 feet. Similar to the proposed Project, Option B would not result in permanent relocation of construction workers. Also similar to the proposed Project, the maximum number of on-site workers required to construct Option B would not exceed 90 at any given time. As such, Option B would require the same amount of temporary housing as the proposed Project and would result in less than significant impacts (Class III) to local vacancy rates. Option B would not result in the destruction or relocation of any housing or displace a large number of people.

Similar to the proposed project, Option B would not result in population growth and therefore would have less than significant (Class III) impacts to public services.

Similar to the proposed project, impacts to utilities and service systems such as electricity, natural gas, water, wastewater, solid waste, recycling or underground utility lines and facilities would be less than significant (Class III).

Option C

Under Option C, the length of Line 406 would be increased by approximately 1,150 feet. Similar to the proposed Project, Option C would not result in permanent relocation of construction workers. Also similar to the proposed Project, the maximum number of on-site workers required to construct Option C would not exceed 90 at any given time. As such, Option C would require the same amount of temporary housing as the proposed Project and would result in less than significant impacts (Class III) to local vacancy rates. Option C would not result in the destruction or relocation of any housing or displace a large number of people.

Similar to the proposed project, Option C would not result in population growth and therefore would have less than significant (Class III) impacts to public services. Similar to the proposed project, impacts to utilities and service systems such as electricity, natural gas, water, wastewater, solid waste, recycling or underground utility lines and facilities would be less than significant (Class III).

Option D

Under Option D the length of Line 406 would be increased by approximately 860 feet. Similar to the proposed Project, Option D would not result in permanent relocation of construction workers. Also similar to the proposed Project, the maximum number of on-site workers required to construct Option D would not exceed 90 at any given time. As such, Option D would require the same amount of temporary housing as the proposed Project and would result in less than significant impacts (Class III) to local vacancy rates. Option D would not result in the destruction or relocation of any housing or displace a large number of people.

Similar to the proposed project, Option D would not result in population growth and therefore would have less than significant (Class III) impacts to public services. Similar to the proposed project, impacts to utilities and service systems such as electricity, natural gas, water, wastewater, solid waste, recycling or underground utility lines and facilities would be less than significant (Class III).

Option E

Under Option E the length of Line 406 would be increased by approximately 3,480 feet. Similar to the proposed Project, Option E would not result in permanent relocation of construction workers. Also similar to the proposed Project, the maximum number of on-site workers required to construct Option E would not exceed 90 at any given time. As such, Option E would require the same amount of temporary housing as the proposed Project and would result in less than significant impacts (Class III) to local vacancy rates. Option E would not result in the destruction or relocation of any housing or displace a large number of people.

Similar to the proposed project, Option E would not result in population growth and therefore would have less than significant (Class III) impacts to public services. Similar to the proposed project, impacts to utilities and service systems such as electricity, natural gas, water, wastewater, solid waste, recycling or underground utility lines and facilities would be less than significant (Class III).

Option F

Option F involves a minor location shift and would not change the overall length of the proposed alignment. Similar to the proposed Project, Option F would not result in permanent relocation of construction workers. Also similar to the proposed Project, the maximum number of on-site workers required to construct Option F would not exceed 90 at any given time. As such, Option F would require the same amount of temporary housing as the proposed Project and would result in less than significant impacts (Class III) to local vacancy rates. Option F would not result in the destruction or relocation of any housing or displace a large number of people.

Similar to the proposed project, Option F would not result in population growth and therefore would have less than significant (Class III) impacts to public services. Similar to the proposed project, impacts to utilities and service systems such as electricity, natural gas, water, wastewater, solid waste, recycling or underground utility lines and facilities would be less than significant (Class III).

Option G

Option G involves a minor location shift and would not change the overall length of the proposed alignment. Similar to the proposed Project, Option G would not result in permanent relocation of construction workers. Also similar to the proposed Project, the maximum number of on-site workers required to construct Option G would not exceed 90 at any given time. As such, Option G would require the same amount of temporary housing as the proposed Project and would result in less than significant impacts (Class III) to local vacancy rates. Option G would not result in the destruction or relocation of any housing or displace a large number of people.

Similar to the proposed project, Option G would not result in population growth and therefore would have less than significant (Class III) impacts to public services. Similar to the proposed project, impacts to utilities and service systems such as electricity, natural gas, water, wastewater, solid waste, recycling or underground utility lines and facilities would be less than significant (Class III).

Option H

Under Option H the length of Line 407 W would be reduced by approximately 2,900 feet. Similar to the proposed Project, Option H would not result in permanent relocation of construction workers. Also similar to the proposed Project, the maximum number of on-site workers required to construct Option H would not exceed 90 at any given time. As such, Option H would require the same amount of temporary housing as the proposed Project and would result in less than significant impacts (Class III) to local vacancy rates. Option H would not result in the destruction or relocation of any housing or displace a large number of people.

Similar to the proposed project, Option H would not result in population growth and therefore would have less than significant (Class III) impacts to public services. Similar to the proposed project, impacts to utilities and service systems such as electricity, natural gas, water, wastewater, solid waste, recycling or underground utility lines and facilities would be less than significant (Class III).

Option I

Under Option I, the length of Line 407 E would be increased approximately 2,900 feet. Similar to the proposed Project, Option I would not result in permanent relocation of construction workers. Also similar to the proposed Project, the maximum number of on-site workers required to construct Option I would not exceed 90 at any given time. As such, Option I would require the same amount of temporary housing as the proposed Project and would result in less than significant impacts (Class III) to local vacancy rates. Option I would not result in the destruction or relocation of any housing or displace a large number of people.

Similar to the proposed project, Option I would not result in population growth and therefore would have less than significant (Class III) impacts to public services. Similar to the proposed project, impacts to utilities and service systems such as electricity, natural gas, water, wastewater, solid waste, recycling or underground utility lines and facilities would be less than significant (Class III).

Option J

Under Option J, the length of Line 407 E would be increased by approximately 5,250 feet. Similar to the proposed Project, Option J would not result in permanent relocation of construction workers. Also similar to the proposed Project, the maximum number of on-site workers required to construct Option J would not exceed 90 at any given time. As such, Option J would require the same amount of temporary housing as the proposed Project and would result in less than significant impacts (Class III) to local vacancy rates. Option J would not result in the destruction or relocation of any housing or displace a large number of people.

Similar to the proposed project, Option J would not result in population growth and therefore would have less than significant (Class III) impacts to public services. Similar to the proposed project, impacts to utilities and service systems such as electricity, natural gas, water, wastewater, solid waste, recycling or underground utility lines and facilities would be less than significant (Class III).

Option K

Under Option K, the length of Line 407 E would be increased by approximately 70 feet. Similar to the proposed Project, Option K would not result in permanent relocation of construction workers. Also similar to the proposed Project, the maximum number of on-site workers required to construct Option K would not exceed 90 at any given time. As such, Option K would require the same amount of temporary housing as the proposed Project and would result in less than significant impacts (Class III) to local vacancy rates. Option K would not result in the destruction or relocation of any housing or displace a large number of people.

Similar to the proposed project, Option K would not result in population growth and therefore would have less than significant (Class III) impacts to public services. Similar to the proposed project, impacts to utilities and service systems such as electricity, natural gas, water, wastewater, solid waste, recycling or underground utility lines and facilities would be less than significant (Class III).

Option L

Option L would not increase or decrease the length of Line 407 E. Similar to the proposed Project, Option L would not result in permanent relocation of construction workers. Also similar to the proposed Project, the maximum number of on-site workers required to construct Option L would not exceed 90 at any given time. As such, Option L would require the same amount of temporary housing as the proposed Project and would result in less than significant impacts (Class III) to local vacancy rates. Option L would not result in the destruction or relocation of any housing or displace a large number of people.

Similar to the proposed project, Option L would not result in population growth and therefore would have less than significant (Class III) impacts to public services. Similar to the proposed project, impacts to utilities and service systems such as electricity, natural gas, water, wastewater, solid waste, recycling or underground utility lines and facilities would be less than significant (Class III).

Table 4.12-5: Comparison of Alternatives for Population and Housing/Public Services/Utilities and Service Systems

Alternative	Comparison with Proposed Project
No Project	No Impacts
Option A	Similar Impact
Option B	Similar Impact
Option C	Similar Impact
Option D	Similar Impact
Option E	Similar Impact
Option F	Similar Impact
Option G	Similar Impact
Option H	Similar Impact
Option I	Similar Impact
Option J	Similar Impact
Option K	Similar Impact
Option L	Similar Impact
Source: Michael Brandman Associates 2009.	

4.12.7 Cumulative Projects Impact Analysis

Section 3.0, Alternatives and Cumulative Projects, provides a description of identifiable projects that may be constructed in close proximity to the proposed Project. Specifically, the Placer Vineyards Specific Area Plan and the Sierra Vista Specific Plan are both scheduled to begin in 2008 and are located south and north, respectively, of the eastern end of Line 407 East. Both of the aforementioned projects have potential cumulative impacts related to the proposed Project.

While this Project would not contribute to cumulative impacts related to demand for public services or displace a large amounts of people, construction of this Project, in conjunction with other projects, may result in a cumulative impact to temporary housing and population growth.

Temporary Housing

Should the construction schedules of projects included in the Placer Vineyards Specific Area Plan or the Sierra Vista Specific Plan coincide, the amount of non-local construction workers requiring temporary housing and other public services may increase. The proposed Project's contribution to this cumulative impact would be temporary in nature as the proposed pipeline's construction period would only last 10 months total (in several phases). In addition, construction workers on the proposed Project would be spread out along the pipeline and would not necessarily utilize temporary housing near the Placer Vineyards or Sierra Vista areas. As such, cumulative impacts to available temporary housing would occur during the length of time that construction schedules would overlap.

Population Growth

Upon completion, operation of the proposed Project, along with the Placer Vineyards Specific Area Plan and Sierra Vista Specific Plan, would not contribute to cumulative population growth. While the pipeline would not directly connect to housing or businesses, it would provide the ability for future housing or businesses to receive natural gas through additional distribution infrastructure. However, it should be noted that PG&E's projections for their 10-year investment plan assume an additional 19,890 customers in an area where they are currently serving 675,000 customers. This represents a projected increase of 2.9 percent. This figure is substantially less than estimated population growth (see Table 4.12-2) for the counties where the proposed Project would be located. The potential for the Project to result in growth inducing impacts is discussed in Section 6.0, Other Required CEQA Sections.

The Placer Vineyards Specific Plan would be implemented over a 20 to 30 year period and would ultimately have a population of approximately 33,000 people. The Plan specifies that natural gas service would be provided via an existing distribution main located at the corner of Baseline Road and Cook Riolo Road. A distribution main along Baseline Road and a transmission main along PFE Road would deliver natural gas to the Plan's area. As such, Placer Vineyards would not directly connect to the proposed Project but would benefit from the capacity and reliability that would be added to the regional natural gas transmission system resulting from the implementation of this Project.

The Sierra Vista Specific Plan includes approximately 9,995 residential units providing housing for approximately 25,219 people at build-out. An Initial Study completed for the Sierra Vista Specific Plan identifies that natural gas service would be provided to the Plan's area via existing and planned infrastructure adjacent to the Sierra Vista project site. Additionally, the Initial Study concludes that the Plan has the potential to induce substantial population growth either directly or indirectly. As such, the Placer Vineyards Plan, and the Sierra Vista Specific Plan, along with the proposed Project, would result in cumulative impacts and would cause a permanent population increase of 3 percent or more in Placer County.

Displace People

The Placer Vineyards and Sierra Vista Specific Plan areas are currently comprised of agricultural or undeveloped lands. The proposed Project alignment mostly occurs on agricultural lands and would not displace large numbers of people. When considered along with the proposed Project, these two projects would not displace large numbers of people. Therefore, there would not be any cumulative impacts with respect to this criterion. The natural gas needs of the Sierra Vista Specific Plan would be reviewed by PG&E upon request for need, and may or may not require this Project. The Placer Vineyards Specific Plan indicates that PG&E maintains three natural gas pipelines in its project area, and indicates an extension is already planned, but does not specifically identify this Project.

4.12.8 Summary of Impacts and Mitigation Measures

This purpose of this Project is to support existing and approved future planned population growth in the Project vicinity and would not directly or indirectly increase permanent population in the Project area. PG&E's planned increases in natural gas in Lines 406 and 407 would accommodate demand for anticipated residential and small commercial entity gas consumption. Average annual gas throughput and residential demand for gas would both grow at an annual average of about 3 percent. The customers that could be served by the proposed pipeline would not be solely dependent on the proposed Project for natural gas. Projected new residential demand that would occur as a result of implementation of the Placer Vineyards and Sutter Pointe Specific Plans have already been anticipated. As a result, the addition or lack of natural gas associated with the proposed Project would not likely affect development in the region.

Increase in demand for housing, public services, and service systems are generally associated with population growth. Since both Project construction and operation are not expected to directly or indirectly induce substantial population growth, demand for such services are not expected to increase. As stated previously, the proposed Project would meet some but not all of future demands for natural gas. Therefore, impacts to population, housing, public services, and services systems would be less than significant and no mitigation measures are required.

4.13 TRANSPORTATION AND TRAFFIC

This Section describes existing conditions, potential Project-related impacts, and proposed mitigation measures for transportation and circulation issues in the Project area. Included are descriptions of the environmental setting in terms of transportation and traffic that could be affected by the proposed Project. Federal, State, and local regulations that could affect the Project construction and operation are discussed followed by discussions of impacts and mitigation measures, organized by each of the significance criteria identified.

4.13.1 Environmental Setting

The roadway network affected by the Project is in Yolo, Sutter, Sacramento, and Placer counties. The transportation system is composed of State, city, and county roads. Table 4.13-1 summarizes the characteristics of the roadways in the vicinity of the Project area. Figure 4.13-1 shows the roadways in the Project area.

As described in Section 1.0, Introduction, one of the Project objectives is to locate the pipeline to minimize the risk of damage to the pipeline from outside sources. In keeping with that objective, the pipeline is not located within the roadways right-of-way (ROW). Instead the pipeline would parallel roadways at a location outside of the ROW, and in many areas would extend across agricultural fields. Only in areas where the pipeline crosses a roadway (transverse crossing) would the roadway and roadway traffic be directly affected by construction.

For major freeways and state highways and the Western Pacific Railroad Line, the pipeline would be installed using horizontal directional drilling (HDD) in order to cross beneath the freeways/highways and railroad line with no effect on traffic.

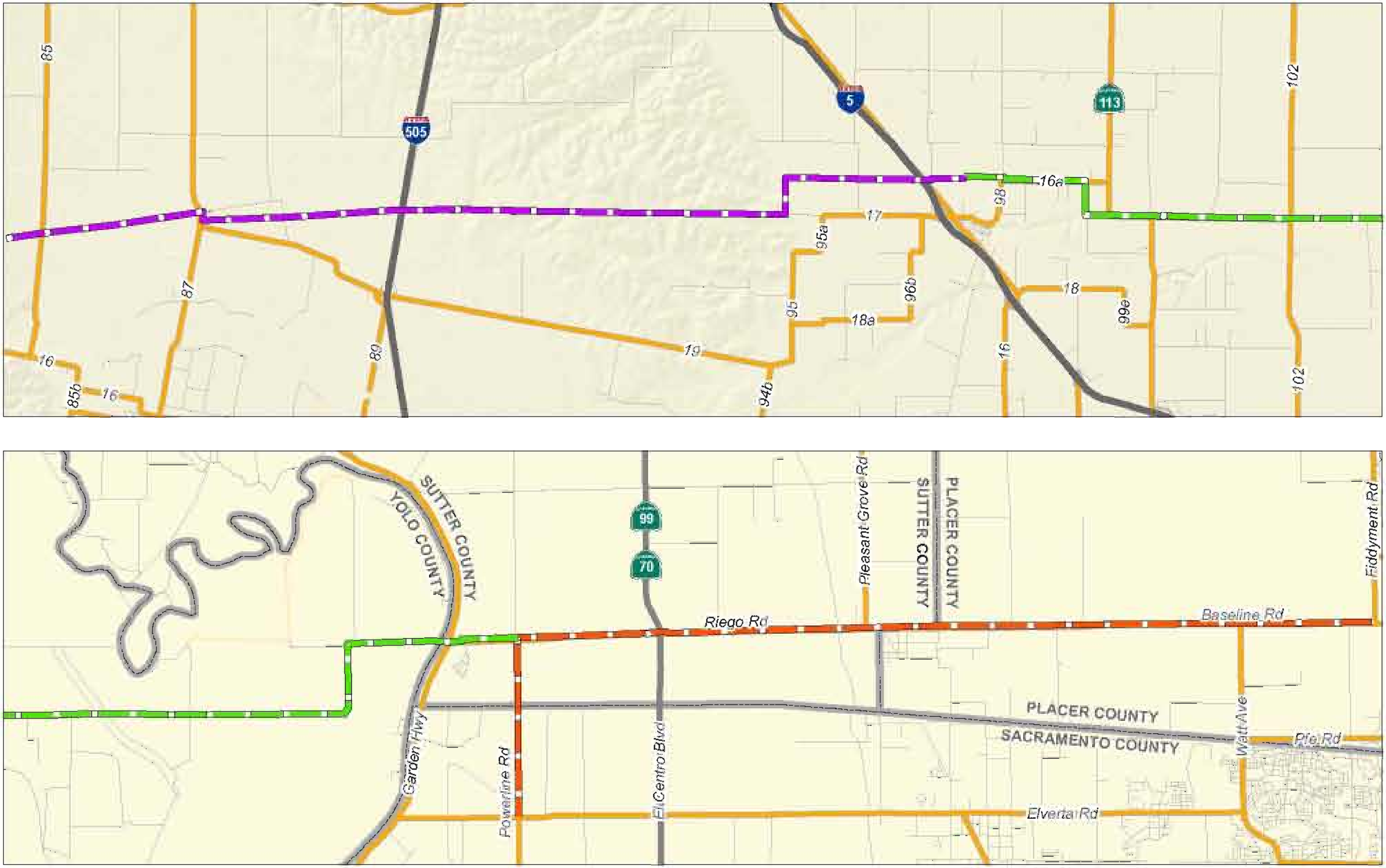
Table 4.13-2 shows traffic counts for various roadways in the Project area. The pipeline alignment is primarily traversed and paralleled by county roads that are not heavily traveled. County Road (CR) 16 and CR-17 are representative of traffic volumes on county roads in the Project vicinity.

Table 4.13-1: Summary of Study Area Roadway Characteristics

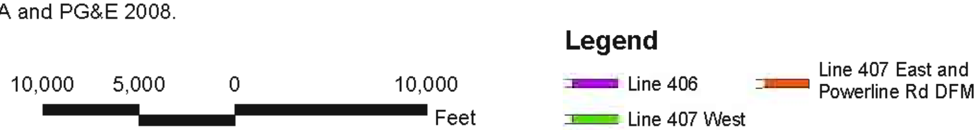
Roadway	Jurisdiction	Classification	Lanes	Traffic Volumes		Location of Pipeline in Relation to Roadway
				Average Daily	Peak Hour	
State Facilities (Line 406)						
Interstate 5	Caltrans	Freeway	4	29,000	2,850	HDD under freeway
Interstate 505	Caltrans	Freeway	4	10,900 to 11,600	1,450 to 1,800	HDD under freeway
Other Roadways (Line 406)						
County Road 16-A	Yolo County	Rural local	2	N/A	N/A	Parallels road outside ROW
County Road 17	Yolo County	Rural local	2	N/A	N/A	Parallels road outside ROW
County Road 85	Yolo County	Rural local	2	N/A	N/A	Crosses road
County Road 87	Yolo County	Rural local	2	N/A	N/A	Crosses road
County Road 88A	Yolo County	Rural local	2	N/A	N/A	Crosses road
County Road 90A	Yolo County	Rural local	2	N/A	N/A	Crosses road
County Road 96	Yolo County	Rural local	2	N/A	N/A	Crosses road
County Road 97	Yolo County	Rural local	2	N/A	N/A	Crosses road
State Facilities (Line 407)						
State Route 70/99 (El Centro Boulevard)	Yolo County	Arterial / Freeway	2 to 4	15,800	1,650	HDD under roadway

Roadway	Jurisdiction	Classification	Lanes	Traffic Volumes		Location of Pipeline in Relation to Roadway
				Average Daily	Peak Hour	
State Route 113	Caltrans	Arterial / Freeway	2	3,150	290	Under roadway
Other Roadways (Line 407)						
County Road 16A	Yolo County	Rural local	2	N/A	N/A	Parallels road outside ROW
County Road 17	Yolo County	Rural local	2	N/A	N/A	Crosses, then parallels road outside ROW
County Road 98	Yolo County	Rural local	2	N/A	N/A	Crosses road
County Road 99B	Yolo County	Rural local	2	N/A	N/A	Crosses road
County Road 100	Yolo County	Rural local	2	N/A	N/A	Crosses road
County Road 101	Yolo County	Rural local	2	N/A	N/A	Crosses road
County Road 102	Yolo County	Rural local	2	N/A	N/A	Crosses road
Pacific Avenue	Sutter County	Rural local	2	N/A	N/A	Crosses road
Garden Highway	Sutter County	Arterial	2	N/A	N/A	HDD under roadway
Powerline Road	Sutter County	Collector	2	N/A	N/A	Crosses road
Riego Road / Baseline Road	Sutter / Placer counties	Collector	2	N/A	N/A	Parallels road outside ROW
East Levee Road / Western Pacific Railroad	Placer County	Collector	2	N/A	N/A	HDD under roadway
Locust Road	Placer County	Collector	2	N/A	N/A	Crosses road
Pleasant Grove Road	Placer County	Collector	2	N/A	N/A	Crosses road

Roadway	Jurisdiction	Classification	Lanes	Traffic Volumes		Location of Pipeline in Relation to Roadway
				Average Daily	Peak Hour	
Distribution Feeder Main (DFM)						
Powerline Road	Sutter / Sacramento Counties	Collector	2	N/A	N/A	Parallels road outside ROW
West Elverta Road	Sacramento County	Collector	2	N/A	N/A	Crosses road
Source: PG&E Line 406 and Line 407 Pipeline Project Supplemental CSLC Filing. October 2007.						



Source: ESRI Street Map USA and PG&E 2008.



Michael Brandman Associates

Figure 4.13-1
Project Roadways

Table 4.13-2: Existing Traffic Volumes

Roadway	County	Description	Average Daily Traffic
Interstate 5	Sacramento	Sacramento, Junction Route 99 North	81,000
Interstate 5	Yolo	Yolo Interchange, County Road 17	25,000
State Route 113	Yolo	Junction Route 5	6,800
Interstate 505	Yolo	Junction Route 16	12,600
Interstate 505	Yolo	County Road 19 Interchange	11,800
State Route 70/99 (El Centro Boulevard)	Sacramento	Elverta Road	39,500
State Route 70/99 (El Centro Boulevard)	Sutter	Riego Road	34,000
Powerline Road	Sacramento	North of Elkhorn Boulevard	519
Elverta Road	Sacramento	East of El Centro Road	6,042
County Road 16AB[1]	Yolo	Between State Route 113 and County Road 98	361
County Road 17AB	Yolo	Between State Route 113 and County Road 99A	110
County Road 17E	Yolo	Between County Road 101and County Road 102	978
County Road 102F	Yolo	North of County Road 18C	6,823
Baseline Road	Placer	East of Walerga Road	15,500
Baseline Road	Placer	Locust Road	9,600

Notes:
Yolo County Road Traffic Counts are from 2002 2003, and 2004. All other counts are from 2006.
Source: Caltrans 2008, Sacramento County 2008, Yolo County 2008, Placer County 2008.

Freeways and State Highways

California Department of Transportation (Caltrans) maintains the facilities described in this subsection. At these locations, the pipeline would be installed using horizontal directional drilling (HDD) in order to cross beneath the freeways and state highways, as well as the Western Pacific Railroad line.

Line 406

Interstate 5

Interstate (I) 5 is a freeway that extends from San Diego, California at the Mexican border to Blaine, Washington at the Canadian border and passes through major cities along the west coast of the United States, including Los Angeles, Sacramento, Portland, and Seattle. Caltrans District 3 in Sacramento County maintains I-5 near the Project area. The freeway runs perpendicular (north-south) to the Line 406 alignment. I-5 is four lanes in width near the Project area. The pipeline would cross under the freeway near CR-17. In the Project area I-5 operates at a level of service (LOS) A.

Interstate 505

I-505 is a freeway that connects I-80 in Vacaville with I-5 near Dunnigan. I-505 provides southbound travelers on I-5 a fast connection to the San Francisco Bay Area. Similarly, drivers heading northeast out of the Bay Area may also use this highway to go to the Pacific Northwest via I-5. Caltrans District 3 in Sacramento County maintains I-505 near the Project area. The freeway runs perpendicular (north-south) to the Line 406 alignment. I-505 is four lanes in width near the Project area. The pipeline would cross under the freeway near CR-17. In the Project area I-505 operates at an LOS A.

Line 407

State Route 99

State Route (SR) 99 is a north-south highway that traverses California's Central Valley from the north near Red Bluff (at SR-36) to the south near Bakersfield (at I-5). SR-99 near the Project area is maintained by the Caltrans District 3 in Sacramento County, and is identified as SR-70 (El Centro Boulevard). SR-99 runs perpendicular (north-south) to the Line 407 alignment. SR-99 is four lanes in width near the Project area. The pipeline would be cross under the freeway near CR-17. In the Project area SR-99/70 operates at an LOS A.

State Route 113

SR-113 runs from Yuba City to approximately 10 miles from Rio Vista (at SR-12). It is an important connecting route between I-80 and I-5. SR-113 near the Project area is maintained by the Caltrans District 3 in Sacramento County. SR-113 runs perpendicular (north-south) to the Line 407 alignment. SR-113 is two lanes in width near the Project area. The Project would cross under SR-113 near CR-17. In the Project area SR-113 operates at an LOS D.

Other Roadways

The following roadways that would be affected by the Project, organized by Line 406, Line 407, and the DFM are described below and are maintained by Yolo, Sutter, Sacramento, and Placer counties. As described above, for the most part, in keeping with Project objectives, the pipeline does not run within roadway ROW but instead parallels the roadways outside the ROW. Only in areas where the pipeline alignment crosses a roadway (transverse crossing) would the roadway and roadway traffic be directly affected by construction.

The other roadways that are crossed by the Project would involve a combination of conventional trenching, and conventional boring techniques such as jack-and-boring. Table 2-5 in Section 2.0, Project Description, provides the approximate crossing width and type of crossing.

Line 406

County Road 17

The pipeline would run parallel to CR-17 through the Dunnigan Hills from I-505 to approximately 2.0 miles west of I-5. CR-17 in the vicinity of the Project is under Yolo County's jurisdiction and is an east-west rural connector. The land uses adjacent to CR-17 are agricultural. This section of CR-17 is a two-lane roadway, with low average daily traffic (ADT) volumes in the Project area.

County Road 85

The pipeline would cross CR-85 approximately 4,500 feet south of CR-16. CR-85 in the vicinity of the Project is under Yolo County's jurisdiction and is a north-south rural connector. The land uses adjacent to CR-85 are agricultural. This section of CR-85 is a two-lane roadway, with low ADT volumes.

County Road 87

The pipeline would cross CR-87 just north of the intersection with CR-19. CR-87 in the vicinity of the Project is under Yolo County's jurisdiction and is a north-south rural connector. The land uses adjacent to CR-87 are agricultural. This section of CR-87 is a two-lane roadway, with low ADT volumes.

County Road 88A

The pipeline would cross CR-88A approximately 1,350 feet south of CR-17. CR-88A in the vicinity of the Project is under Yolo County's jurisdiction and is a north-south rural connector. The land uses adjacent to CR-88A are mainly agricultural. This section of CR-88A is a two-lane roadway, with low ADT volumes.

County Road 96

The pipeline would extend beneath CR-96 and an irrigation canal for approximately 150 feet and continue east to a location approximately 3,000 feet east of CR-96. CR-96 is a two-lane roadway, with low ADT volumes.

County Road 97

The pipeline HDD beneath I-5 and CR-99W would end approximately 200 feet west of CR-97. The pipeline would extend along CR-16A and across CR-97, a two-lane road, with low average daily traffic (ADT) volumes.

Line 407

County Road 98

The pipeline would cross CR-98, adjacent to and north of CR-16A. CR-98 in the vicinity of the Project is under Yolo County's jurisdiction and is a north-south rural connector. The land uses adjacent to CR-98 are agricultural. This section of CR-98 is a two-lane roadway, with low ADT volumes.

County Road 16A

The pipeline would run parallel to CR-16A from CR-98 to 99B. CR-16A in the vicinity of the Project is under Yolo County's jurisdiction and is an east-west rural connector. The land uses adjacent to CR-16A are agricultural. This section of CR-16A is a two-lane roadway, with low ADT volumes.

County Road 99B

The pipeline would run parallel to CR-99B from CR-16A to CR-17. CR-99B in the vicinity of the Project is under Yolo County's jurisdiction and is a north-south rural connector. The land uses adjacent to CR-99B are agricultural. This section of CR-99B is a two-lane roadway, with low ADT volumes.

County Road 17

The pipeline would cross, and then would run parallel, to CR-17 from CR-99B to the Yolo Bypass. CR-17 in the vicinity of the Project is under Yolo County's jurisdiction and is an east-west rural connector. The land uses adjacent to CR-17 are agricultural. This section of CR-17 is a two-lane roadway, with low ADT volumes.

County Road 100

The pipeline would cross CR-100, adjacent to and north of CR-17. CR-100 in the vicinity of the Project is under Yolo County's jurisdiction and is a north-south rural connector. The land uses adjacent to CR-100 are agricultural. This section of CR-100 is a two-lane roadway, with low ADT volumes.

County Road 101

The pipeline would cross CR-101, adjacent to and north of CR-17. CR-101 in the vicinity of the Project is under Yolo County's jurisdiction and is a north-south rural connector. The land uses adjacent to CR-101 are agricultural. This section of CR-101 is a two-lane roadway, with low ADT volumes.

County Road 102

The pipeline would cross CR-102, adjacent to and north of CR-17. CR-102 in the vicinity of the Project is under Yolo County's jurisdiction and is a north-south rural connector. The land uses adjacent to CR-102 are agricultural. This section of CR-102 is a two-lane roadway, with low ADT volumes.

Garden Highway

The pipeline cross beneath Garden Highway at the intersection of Riego Road. Garden Highway in the vicinity of the Project is under Sutter County's jurisdiction and is a north-south major arterial. The land uses adjacent to Garden Highway are agricultural, with some residential. In the vicinity of the Project, Garden Highway is a two-lane arterial, with low ADT volumes.

Riego Road/Baseline Road

The pipeline would run parallel to Riego Road from the Garden Highway to Fiddyment Road. Riego Road in the vicinity of the Project is under the jurisdiction of Sutter and Placer counties. Riego Road is an east-west rural connector. Riego Road is known as Baseline Road when it stretches into Placer County. The land uses adjacent to Riego Road are mainly agricultural (rice fields). East of SR-70/99

(El Centro Boulevard), Riego Road serves as a connector for several residential pockets in the eastern edges of Sutter County and the western edges of Placer County. In the vicinity of the Project, Riego Road is a two-lane collector, with an ADT of approximately 12,600 vehicles.

East Levee Road/Western Pacific Railroad

East Levee Road and the Western Pacific Railroad line would be crossed at the intersection with Riego Road. The south segment of East Levee Road from Riego Road is known as Natomas Road. East Levee Road in the vicinity of the Project is under Sutter County's jurisdiction and is a north-south roadway. The land uses adjacent to East Levee Road are agricultural. In the vicinity of the Project, East Levee Road/Natomas Road is a two-lane collector, with low ADT volumes.

Pleasant Grove Road

Pleasant Grove Road would be crossed at the intersection with Baseline Road. Pleasant Grove Road in the vicinity of the Project is under Sutter County's jurisdiction and is a north-south roadway. The land uses adjacent to Pleasant Grove Road are agricultural with some residential. In the vicinity of the Project, Pleasant Grove Road is a two-lane collector, with an ADT of approximately 1,600 vehicles.

Locust Road

The pipeline would cross Locust Road at the intersection with Baseline Road. Locust Road in the vicinity of the Project is under Sutter County's jurisdiction and is a north-south roadway. The land uses adjacent to Locust Road are agricultural, with some residential. In the vicinity of the Project, Locust Road is a two-lane collector, with low ADT volumes.

Watt Avenue

Watt Avenue extends south off of Baseline Road. Watt Avenue in the vicinity of the Project is under Placer County jurisdiction and is a north-south roadway. The land uses adjacent to Watt Avenue are agricultural and open space. In the vicinity of the Project, Watt Avenue is a two-lane collector with low ADT volumes.

Walerga Road

Walerga Road connects to Fiddyment Road at Baseline Road and travels south from Baseline Road. Walerga Road in the vicinity of the Project is under City of Roseville jurisdiction and is a north-south roadway. The land uses adjacent to Walerga Road are primarily residential with some open space. In the vicinity of the Project, Fiddyment Road is a four-lane arterial road.

<u>Fiddyment Road</u>

The pipeline would end at Fiddyment Road within the City of Roseville's Sphere of Influence. Fiddyment Road in the vicinity of the Project is under City of Roseville jurisdiction and is a north-south roadway. The land uses adjacent to Fiddyment Road are residential to the east, and open space and agricultural to the west. In the vicinity of the Project, Fiddyment Road is two-lane collector.

Powerline Road Distribution Feeder Main

<u>Powerline Road</u>

The pipeline would cross Powerline Road at the intersection of Riego Road, and the DFM would run parallel to Powerline Road from Riego Road south to Elverta Road. The south segment of Powerline Road is under the jurisdiction of Sacramento County and the north segment is under Sutter County's jurisdiction. The land uses adjacent to Powerline Road are agricultural. In the vicinity of the Project, Powerline Road is a two-lane collector, with low ADT volumes.

<u>West Elverta Road</u>

The DFM would cross West Elverta Road and end at the Powerline Road Pressure Regulating Station. West Elverta Road in the vicinity of the Project is under Sacramento County's jurisdiction and is an east-west roadway. The land uses adjacent to West Elverta Road are agricultural with some residential. In the vicinity of the Project, West Elverta Road is a two-lane collector, with low ADT volumes.

4.13.2 Regulatory Setting

Federal

There are no Federal regulations pertaining to traffic or transportation in the Project area.

State

California Vehicle Code

Chapter 2, Article 3 of the California Vehicle Code defines the powers and duties of the California Highway Patrol, which has enforcement responsibilities for the operation of vehicles and highway use within the state.

California Department of Transportation (Caltrans)

Caltrans is responsible for the design, construction, maintenance, and operation of the California State Highway System, as well as portions of the Interstate Highway System within the State's boundaries.

Local

Because the California Public Utilities Commission has exclusive jurisdiction over the design, location, construction, and operation of gas transmission facilities owned and operated by investor-owned public utilities, PG&E is not subject to local ordinances and regulations. Nonetheless, as part of its environmental review under the California Environmental Quality Act (CEQA), the following local regulations and policies were considered in the assessment of traffic and transportation impacts.

Yolo County General Plan

The following policies relating to transportation from the Yolo County General Plan were considered in this analysis:

> **CIR 7:** Yolo County shall require a service level of C for all county roads.

> **CIR 17:** Residential Truck Routes: Yolo County shall discourage truck traffic on residential streets and shall apply traffic controls, speed limits, and load limits on residential street truck routes where assignment to truck traffic is unavoidable.

Sutter County General Plan

The following policies relating to transportation from the Sutter County General Plan were considered in this analysis:

> **2b:** Sutter County has identified Level of Service (LOS) D as the minimum acceptable standard. There are no roadways within Sutter County that are

operating beyond capacity. Numerous segments of State Route 99 have been identified as operating at or near capacity.

Sacramento County General Plan

The following policies relating to transportation from the Circulation Element of the Sacramento County General Plan were considered in this analysis:

CI-22: Sacramento County shall apply the following LOS standards for planning roads in the unincorporated area:

- Rural collectors: LOS D
- Urban area roads: LOS E

and may proceed with additional capacity projects within the scope of the adopted Transportation Plan when the Board of Supervisors has determined that the implementation of all feasible measures which would reduce travel demand in the affected corridor would not provide the target level of service.

Placer County General Plan

The following policies relating to transportation from the Placer County General Plan were considered in this analysis:

3-A5: Through-traffic shall be accommodated in a manner that discourages the use of neighborhood roadways, particularly local streets. This through traffic, including through truck traffic, shall be directed to appropriate routes in order to maintain public safety and local quality of life.

3-A7: The County shall develop and manage its roadway system to maintain the following LOS:

- LOS C on rural roadways, except within 0.5 mile of State highways where the standards shall be LOS D.
- LOS C on urban/suburban roadways, except within 0.5 mile of State highways where the standards shall be LOS D.

The County may allow exceptions to these levels of service standards where it finds that the improvements or other measures required to achieve the LOS standards are unacceptable based on established criteria. In allowing any exception to the standards, the County shall consider the following factors:

- The number of hours per day that the intersection or roadway segment would operate at conditions worse than the standard;
- The ability of the required improvement to significantly reduce peak hour delay and improve traffic operations;
- The ROW needs and the physical impacts on surrounding properties;
- The visual aesthetics of the required improvement and its impact on community identity and character;
- Environmental impacts, including air quality and noise impacts;
- Construction and ROW acquisition costs;
- The impacts on general safety;
- The impacts of the required construction phasing and traffic maintenance;
- The impacts on quality of life as perceived by the residents; and
- Consideration of other environmental, social, or economic factors on which the County may base findings to allow an exceedance of the standards.

Exceptions to the standards would only be allowed after all feasible measures and options are explored, including alternative forms of transportation.

4.13.3 Significance Criteria

A traffic or transportation impact from Project construction or operation is considered significant and would require mitigation if:

1. Project related traffic or other activities must use an access road that is already at or below Level of Service (LOS) E, or is such that it would bring a roadway down to LOS E. (E level traffic flow is 75 percent to 100 percent of capacity);
2. Project related traffic or other activities would result in a substantial safety hazard to motorists, bicyclists, or pedestrians;

3. Project related traffic or other activities would restrict one or more travel lanes of a primary or secondary arterial during peak-hour traffic with no suitable detour available, thereby reducing the roadway's capacity and creating congestion. An increase in vehicle trips associated with construction workers or equipment would result in a substantial disruption to traffic flow and/or a substantial increase in traffic congestion on the roadways in the Project vicinity;
4. Project implementation could or does result in insufficient parking;
5. The installation of a transmission line within, adjacent to, or across a roadway would reduce the number of, or the available width of, one or more lanes during the peak traffic periods, resulting in a substantial disruption to traffic flow and/or a substantial increase in traffic congestion;
6. Construction activities would restrict access to or from adjacent land uses and there would be no suitable alternative access;
7. A major roadway (arterial or collector classification) would be closed to through traffic as a result of construction activities and there would be no suitable alternative route available;
8. Construction activities or the operation of the Project would interfere with or extend into navigable airspace and could potentially have an impact on aviation activities within the restricted area of a designated airport or helipad;
9. Construction activities or the operation of the Project would result in safety problems for vehicular traffic, pedestrians, transit operations, or trains;
10. Construction activities of the Project would restrict the movement of emergency vehicles, and there would be no reasonable alternative access routes available;
11. Construction activities or staging activities would increase the demand for and/or reduce the supply of parking spaces, and there would be no provisions for accommodating the resulting parking deficiencies;
12. Construction activities would disrupt bus or rail service and there would be no suitable alternatives routes or stops;

13. Construction activities within, adjacent to, or across from a railroad right-of-way would result in temporary disruption of rail traffic; or

14. Construction activities would impede pedestrian movements or bike trails in the construction area and there would be no suitable alternative pedestrian/bicycle access routes.

4.13.4 Applicant Proposed Measures

Applicant Proposed Measures (APMs) have been identified by PG&E in its Environmental Analysis prepared for the CSLC. APMs that are relevant to this Section are presented below. This impact analysis assumes that all APMs would be implemented as defined below. Additional mitigation measures are recommended in this Section if it is determined that APMs do not fully mitigate the impacts for which they are presented.

APM TRANS-1. PG&E will maintain the maximum possible amount of travel-lane capacity on roads during non-construction periods and will provide traffic control (flagging) at all construction sites across roadways.

APM TRANS-2. During construction, PG&E will limit the work zone to a width that, at a minimum, will maintain alternate one-way traffic flow past the construction zone. Alternatively, PG&E will post detour signs on alternate access streets, where available, in the event that complete temporary street closures are required. Detour plans would be submitted to the counties or cities and Caltrans as part of the permit requirements.

APM TRANS-3. Required permits for temporary lane closures will be obtained from Yolo County, Sutter County, Sacramento County, Placer County, and Caltrans. Before obtaining roadway encroachment permits from the counties, PG&E will submit a Transportation Management Plan (TMP), subject to the local jurisdiction's review and approval. As part of the TMP, traffic control measures and construction vehicle access routes will be identified. The TMP will also include discussion of haul routes, limits on the length of open cuts, and resurfacing requirements. The TMP will address work zone hours. Construction of the pipeline will occur for 10 hours a day, 6 days a week, unless otherwise permitted by the local jurisdiction. Property owners and residents on streets where construction will occur will be notified prior to the start of construction. Advance public notification will include postings of notices and appropriate signs.

APM TRANS-4. PG&E will coordinate all construction activities with local law enforcement and fire protection agencies. Emergency service providers will be notified of the timing, location, and duration of construction activities.

APM TRANS-5. PG&E will consult with the Placer County Unified School District at least one month prior to construction to coordinate construction activities adjacent to school bus stops. If necessary, school bus stops will be temporarily relocated or buses will be rerouted until construction in the vicinity is complete. PG&E will also consult with Yuba-Sutter Transit at least one month prior to construction to reduce potential interruption of transit services.

APM TRANS-6. As part of a TMP for the Project, PG&E will identify all access restrictions expected to occur during construction. PG&E will develop a plan for notifying the affected businesses, homes, and other facilities, and prepare a plan to ensure adequate access at all times. This plan may involve alternate access, detours, or other temporary mitigations.

APM TRANS-7. As part of the TMP, PG&E will develop for residential areas a notification process for temporary parking impacts and appropriate sign postings. PG&E will minimize the length of any temporary parking restrictions, develop appropriate sign postings, and specify the process for communicating with affected residents.

APM TRANS-8. Where construction will result in temporary closures of sidewalks and other pedestrian facilities, PG&E will provide temporary pedestrian access, through detours or safe areas along the construction zone. Any affected pedestrian facilities and the alternative facilities or detours that will be provided will be identified in the TMP. Where construction activity will result in bike lane closures, appropriate detours and signs will be provided. Where trenching will affect bicycle travel on streets without bicycle facilities, requirements for plates to cover trenches will be in accordance with the permit requirements of the local jurisdiction.

4.13.5 Impact Analysis and Mitigation

Impact Discussion

Line 406, Line 407, and the DFM include installation of an underground natural gas transmission line with several crossings of local roads, freeways/highways, and a railroad line.

Using horizontal directional drilling (HDD) beneath freeways/highways (I-505, I-5, SR-99, Garden Highway, and the Western Pacific Railroad to passing completely under the roadways and railroad line would have no impact on traffic.

The other roadways impacted by construction of the proposed Project include: CR-16A, CR-17, CR-85, CR-87, CR-88A, CR-90A, CR-96, CR-97, CR-98, CR-99B, CR-100, CR-101, CR-102, SR-113, Powerline Road, Riego Road/Baseline Road, West Elverta Road, Locust Road, Pleasant Grove Road, and Pacific Avenue.

The installation of the underground natural gas transmission line beneath the other roadways using trenching and conventional boring techniques such as jack-and-boring would cause temporary impacts to Project area roadways. The discussions below outline the potential impacts for underground pipeline installation on roadways.

Effect on LOS on Project Access Roads

Project related traffic or other activities would not use any access roads where level of service (LOS) is E, or result in a reduction of LOS to E. Project construction would temporarily add on the average 80 vehicle trips per day. These trips would include all construction-related commuting and hauling of equipment; construction supplies, and fill to the Project area. The average of 80 vehicle trips per day would occur over a variety of roadways, some of which would parallel the proposed alignment. Therefore, trip distribution would not be concentrated on one or two roadways. As a result, Project construction would not affect traffic or circulation on Project roadways, such that LOS would be reduced to E. Operation of the aboveground facilities would not impact LOS because the facilities would be unmanned facilities. While there would be occasional operation and maintenance activities, the Project would not increase the number of trips on roadways on a regular basis, and would not result in a reduction of LOS to E. Impacts would be less than significant (Class III).

Safety Hazards

Project related traffic or other activities would not result in a safety hazard to motorists, bicyclists, or pedestrians. By their nature, construction activities have the potential to cause safety problems for motorists, bicyclists, or pedestrians. For underground installation, there would be open trenches temporarily in travel paths in a few locations, presenting hazards for vehicles and pedestrians. However, PG&E would follow its standard safety practices, including installing appropriate barriers between work zones and transportation facilities, posting adequate signs, and using proper construction techniques. PG&E is a member of the California Joint Utility Traffic Control Committee, which in 1996 published the Work Area Protection and Traffic Control Manual. The traffic control plans and associated text in this manual conform to the guidelines established by the Federal Department of Transportation and Caltrans. PG&E would follow the recommendations in this manual regarding basic standards for the safe movement of traffic on highways and streets in accordance with section 21400 of the California Vehicle Code. With these practices (e.g., work zone barriers and signing) and the implementation of APMs TRANS-1 through TRANS-8, safety impacts would be less than significant (Class III).

Project Related Traffic Restricts Travel Lanes

Project related traffic or other activities could restrict one or more travel lanes of a primary or secondary arterial during peak-hour traffic, thereby reducing the roadway's capacity and creating congestion. Most of the affected roadways are rural connectors with minor traffic volumes. Riego Road and Powerline Road are likely access roads for construction work at the HDD crossings at the Garden Highway and SR-99. Lane closures and road-crossing disruptions would last only one or two days per location. The underground crossings at I-5, I-505, and East Levee Road/Western Pacific Railroad would be achieved by HDD with no anticipated disruption of traffic. To avoid creating congestion, PG&E would follow the traffic diversion plans as prescribed by the encroachment permits that would be obtained from Yolo County, Sutter County, Sacramento County, Placer County, and Caltrans. With these practices and the implementation of APMs TRANS-1 through TRANS-4, this impact would be less than significant (Class III).

Insufficient Parking

At roadway crossings, the construction zone would only cover a small area, so a minimal number of parking spaces would be affected. In addition, the pipeline would be primarily located on agricultural land, where there are no existing identified parking areas that would be impacted in the rural portions of the Project area. The primary staging areas for vehicles, equipment, materials, and other supplies required for the construction of the pipeline and aboveground facilities would be within the Project temporary construction easement area and in existing industrial and commercial yards where accessible. Staging areas would be approximately 300 feet by 200 feet. In addition, implementation of APM TRANS-8 would ensure any impacts to parking would be less than significant (Class III).

Installation of Transmission Line Restricts Travel Lanes

Installing transmission lines would not restrict travel lanes for more than 48 hours for a particular segment. Since work crews would only work on a particular segment of the pipeline for two days, any lane restrictions would be temporary. The underground crossings at I-5, I-505, Garden Highway, SR-99, and East Levee Road/Western Pacific Railroad would be achieved by HDD with no anticipated disruption of traffic. Short-term, temporary lane restrictions may be unavoidable during construction for some segments of the proposed pipeline alignment that parallel roads in the Project area. To avoid creating congestion, PG&E would follow the traffic diversion plans as prescribed by the encroachment permits that would be obtained from Yolo County, Sutter County, Sacramento County, Placer County, and Caltrans. With these practices and the implementation of APMs TRANS-1 through TRANS-4, this impact would be less than significant (Class III).

Restrict Access to or from Adjacent Land Uses

Construction activities could restrict access to or from adjacent land uses. However, private driveways would not be used for staging areas. The primary staging areas for vehicles, equipment, materials, and other supplies required for the construction of the pipeline and aboveground facilities would be within the Project temporary construction easement area and in existing industrial and commercial yards where accessible. Staging areas would be approximately 300 feet by 200 feet. Impacts to adjacent land uses would be less than significant (Class III). In addition, implementation of APM TRANS-5 through TRANS-8 would ensure impacts to adjacent land uses would be less than significant (Class III).

Major Roadway Closed

The Project would not result in the complete closure of any roadways. For some activities lanes of travel may be restricted to one lane only for up to 48 hours. For all affected roads in the Project area, implementation of APM TRANS-1 through APM TRANS-4 would ensure impacts would be less than significant (Class III).

Interfere with Navigable Airspace

There would not be any interference with navigable airspace since the proposed Project does not cross lands covered by an airport land use plan. The nearest airport to the proposed Project is Sacramento International Airport, approximately 1.5 miles south of the Powerline Road DFM. There are no airports within one mile of proposed alignment, nor are any of lands crossed by the proposed alignment covered by an airport land use plan. Therefore, impacts would be less than significant (Class III).

Restrict Movement of Emergency Vehicles

Routes for emergency vehicles would be maintained throughout Project construction, since at least one travel lane would be kept open during pipeline road-crossing procedures. PG&E would coordinate any lane closures with emergency service providers as directed by the Transportation Management Plan (TMP) to be prepared by PG&E for the Project. Underground construction activities may occasionally cause minor delays for emergency vehicles on roadways in the Project area. However, most construction would occur along county roads with relatively low levels of traffic. APM TRANS-3 and TRANS-4 would be implemented, requiring PG&E to prepare a TMP and to notify emergency service providers of the timing, location, and duration of construction activities. Therefore, impacts would be less than significant (Class III).

Increase Demand for or Reduce Supply of Parking Spaces

The Project would not increase demand for parking spaces. As stated above under Insufficient Parking, at roadway crossings the construction zone would only cover a small area, so a minimal number of parking spaces would be potentially affected. In addition, the pipeline would be primarily located on agricultural land, so there are no identified parking areas that would be impacted in the rural portions of the Project area. Impacts to parking would be less than significant (Class III).

Disrupt Bus or Rail Service

Bus service for Placer County Unified School District may be temporarily disrupted. There are no public transportation rail lines crossed by the proposed alignment. Staging areas would not be located at public transit bus stops. However, bus routes for the Placer County Unified School District may be affected. As stated in APM TRANS-5, PG&E would consult with the Placer County Unified School District at least one month prior to construction to coordinate construction activities adjacent to school bus stops. If necessary, school bus stops would be temporarily relocated or buses would be rerouted until construction in the vicinity is complete. With implementation of APM, TRANS-5, impacts would be less than significant (Class III).

Temporary Disruption of Railroad Traffic

The Western Pacific Railroad line is located within the Project area and will be crossed using horizontal directional drilling (HDD) technique, with no anticipated disruption of railroad traffic. As a result, impacts to rail traffic would be less than significant (Class III).

Impede Pedestrian Movements or Bike Trails

Pedestrian and bicyclist use of roads in the Project area would be temporarily restricted. Construction activities along roadways with sidewalks and bicycle lanes may result in temporary closures of those facilities. Trenching and plating activities at roadway crossings may make travel temporarily more hazardous for pedestrians and those on bicycles. Implementation of APM TRANS-1 through TRANS-8 would reduce these impacts to a less than significant level (Class III).

4.13.6 Impacts of Alternatives

A No Project Alternative as well as twelve options have been proposed for the alignment in order to minimize or eliminate environmental impacts of the proposed Project and to respond to comments from nearby landowners. The twelve options, labeled A through L, have been analyzed in comparison to the portion of the proposed route that has been avoided as a result of the option. Descriptions of the options can be found in Section 3.0, Alternatives and Cumulative Projects, and are depicted in Figure 3-2A through Figure 3-2K.

No Project Alternative

Under the No Project Alternative Lines 406 and 407 and the DFM would not be constructed. As a result, there would not be any impacts to transportation and traffic.

Option A

Option A alternative would shift potential construction traffic impacts to a location north of the proposed pipeline. Option A would increase transportation and traffic impacts by increasing the length of the pipeline along roadways, as well as the number of roadway crossings. The proposed pipeline would cross seven roadways, while Option A would cross nine roadways. These impacts would be reduced to less than significant with the implementation of APM TRANS-1 through APM TRANS-8. Operation of Option A would be the same as the proposed Project and would not result in additional impacts related to traffic.

However, this option would impact the operations of Durst Organic Growers, a business that has approximately 40 employees year round, and as many as 300 during peak farming periods. By placing the pipeline along roadways in close proximity to Durst, a new impact would be created that would require additional mitigation beyond APM TRANS-1 through APM TRANS-8. If this option is chosen, MM TRANS-1 would be required to reduce impacts to less than significant. Option A would result in greater impacts than the proposed Project.

Impact TRANS-1: Project Related Traffic Restricts Travel Lanes

Project related traffic or other activities could restrict one or more travel lanes of a primary or secondary arterial during peak-hour traffic, thereby reducing the roadway's capacity and creating congestion (Potentially Significant, Class II).

MM TRANS-1	**Mitigation for Potential Impacts to Durst Organic Growers.** PG&E shall consult with Durst Organic Growers to coordinate construction activities along the roadways that Durst uses for employees, visitors, and transportation of their produce.

Option B

Option B alternative would shift potential construction traffic impacts to a location north of the proposed pipeline. Option B would cross basically the same number of roadways as the proposed Project. Option B would increase transportation and traffic impacts by increasing the length of the pipeline along roadways. These impacts would be reduced to less than significant with the implementation of APM TRANS-1 through APM TRANS-8. Operation of Option B would be the same as the proposed Project and would not result in additional impacts related to traffic.

However, this option would impact the operations of Durst Organic Growers, a business that has approximately 40 employees year round, and as many as 300 during peak farming periods. By placing the pipeline along roadways in close proximity to Durst, a new impact would be created that would require additional mitigation beyond APM TRANS-1 through APM TRANS-8. If this option is chosen, MM TRANS-1 would be required to reduce impacts to less than significant. Option B would result in greater impacts than the proposed Project.

Option C

Option C alternative would not change any impacts in comparison to the proposed Project. With the implementation of APM TRANS-1 through APM TRANS-8, impacts associated with Option C would be reduced to less than significant. Since construction traffic impacts for Option C would be the same as for the proposed Project, the impact would remain less than significant. Operation of Option C would be the same as the proposed Project and would not result in additional impacts related to traffic. Option C would result in impacts similar to the proposed Project.

Option D

Option D alternative would result in more impacts along CR-17 due to the pipeline extending along this roadway rather than through agricultural fields for a portion of the project. With the implementation of APM TRANS-1 through APM TRANS-8, impacts associated with Option D would be reduced to less than significant. Since construction traffic impacts for Option D would similar to the proposed Project, the impact would remain less than significant. Operation of Option D would be the same as the proposed Project and would not result in additional impacts related to traffic. Option D would result in impacts similar to the proposed Project.

Option E

Option E alternative would result in more impacts along CR-19 due to the pipeline extending along this roadway rather than through agricultural fields for a portion of the project. With the implementation of APM TRANS-1 through APM TRANS-8, impacts associated with Option E would be reduced to less than significant. Since construction traffic impacts for Option E would be similar to the proposed Project, the impact would remain less than significant. Operation of Option E would be the same as the proposed Project and would not result in additional impacts related to traffic. Option E would result in impacts similar to the proposed Project

Option F

Option F alternative would not change any impacts in comparison to the proposed Project. With the implementation of APM TRANS-1 through APM TRANS-8, impacts associated with Option F would be reduced to less than significant. Since construction traffic impacts for Option F would be the same as for the proposed Project, the impact would remain less than significant. Operation of Option F would be the same as the proposed Project and would not result in additional impacts related to traffic. Option F would result in impacts similar to the proposed Project

Option G

Option G alternative would result in impacts that are basically the same as the proposed Project. With the implementation of APM TRANS-1 through APM TRANS-8, impacts associated with Option G would be reduced to less than significant. Since construction traffic impacts for Option G would be similar to the proposed Project, the impact would remain less than significant. Operation of Option G would be the same as the proposed Project and would not result in additional impacts related to traffic. Option G would result in impacts similar to the proposed Project.

Option H

Option H alternative would result in impacts along Elverta Road rather than Riego Road. However, the pipeline alignment length along both roadways would be similar. The pipeline alignment along Powerline Road would not change. All other impacts associated with the proposed Project would be the same with this option as the proposed Project. With the implementation of APM TRANS-1 through APM TRANS-8, impacts associated with Option H would be reduced to less than significant. Since construction traffic impacts for Option H would be the same as for the proposed Project, the impact would remain less than significant. Operation of Option H would be the same as the proposed Project and would not result in additional impacts related to traffic. Option H would result in impacts similar to the proposed Project.

Option I

Option I alternative would result in impacts that are basically the same as the proposed Project. With the implementation of APM TRANS-1 through APM TRANS-8, impacts associated with Option I would be reduced to less than significant. Since construction traffic impacts for Option I would be similar to the proposed Project, the impact would remain less than significant. Operation of Option I would be the same as the proposed Project and would not result in additional impacts related to traffic. Option I would result in impacts similar to the proposed Project.

Option J

Option J alternative would result in impacts that are basically the same as the proposed Project. With the implementation of APM TRANS-1 through APM TRANS-8, impacts associated with Option J would be reduced to less than significant. Since construction traffic impacts for Option J would be similar to the proposed Project, the impact would remain less than significant. Operation of Option J would be the same as the proposed Project and would not result in additional impacts related to traffic. Option J would result in impacts similar to the proposed Project.

Option K

Option K alternative would result in impacts that are basically the same as the proposed Project. With the implementation of APM TRANS-1 through APM TRANS-8, impacts associated with Option K would be reduced to less than significant. Since construction traffic impacts for Option K would be similar to the proposed Project, the impact would remain less than significant. Operation of Option K would be the same as the proposed Project and would not result in additional impacts related to traffic. Option K would result in impacts similar to the proposed Project.

Option L

Option L alternative would increase the length of a proposed Line 407 HDD for approximately 1,000 feet to the east along Base Line Road. This HDD extension would not significantly increase the impacts associated with transportation and traffic. With the implementation of APM TRANS-1 through APM TRANS-8, impacts associated with Option L would be reduced to less than significant. Since construction traffic impacts for Option L would be similar to the proposed Project, the impact would remain less than significant. Operation of Option L would be the same as the proposed Project and would not result in additional impacts related to traffic. Option L would result in impacts similar to the proposed Project.

Table 4.13-3: Comparison of Alternatives for Transportation and Traffic

Alternative	Comparison with Proposed Project
No Project	No Impacts
Option A	Greater Impacts
Option B	Greater Impacts
Option C	Similar Impacts
Option D	Similar Impacts
Option E	Similar Impacts
Option F	Similar Impacts
Option G	Similar Impacts
Option H	Similar Impacts
Option I	Similar Impacts
Option J	Similar Impacts
Option K	Similar Impacts
Option L	Similar Impacts

Source: Michael Brandman Associates 2009.

4.13.7 Cumulative Projects Impact Analysis

The construction of other projects in the vicinity of the proposed Project could cumulatively affect transportation and traffic if the construction activities occurred simultaneously. As discussed in Section 3.4, Cumulative Related Future Projects, several projects are planned in the vicinity of the proposed Project, as shown in Table 3.2. The timing of construction for the cumulative projects is unknown, and it is possible that portions of these projects could be constructed at the same time and in the same vicinity as the proposed Project. However, the proposed Project would not result in any long-term impacts on transportation and traffic, and would therefore not be cumulatively considerable. Cumulative impacts would be less than significant (Class III).

When considered with the cumulative related projects, the proposed Project would not result in cumulative impacts in terms of transportation and traffic in the proposed Project area. The cumulative projects would have the potential to result in impacts to transportation and traffic. However, the proposed Project would not result in cumulative impacts to transportation and traffic because construction impacts would be temporary, and operation of the proposed Project would not result in a long-term increase in traffic on Project area roads that reduces traffic to LOS E. The proposed Project when considered with the cumulative related projects would not result in cumulative impacts to safety, increased congestion, insufficient parking, restricting parking lanes, property access, roadway closures, pedestrians, navigable airspace, transit operations, trains, or movement of emergency vehicles..

4.13.8 Summary of Impacts and Mitigation Measures

Through the implementation of APM TRANS-1 through APM TRANS-8, the proposed Project would not result in a long-term traffic increase that results in an LOS E, create substantial safety hazards to motorists, bicyclists, or pedestrians, restrict travel lanes due to installation of a transmission line, restrict access to and from adjacent land uses, close a major roadway, interfere with navigable airspace, result in safety problems for vehicles, pedestrians, transit operations or trains. Nor would the Project restrict movement of emergency vehicles, increase demand for parking, disrupt rail or bus service, disrupt rail traffic, or impede pedestrian movements or bike trails in the construction area. Therefore, impacts to transportation and traffic would be less than significant (Class III), and no mitigation measures are required.

Implementation of Option A or Option B would result in potentially significant impacts (Class II) to traffic near Durst Organic Growers and, in addition to APM TRANS-1 through APM TRANS-8, would require implementation of MM TRANS-1 in order to reduce impacts to less than significant (Class III).

Table 4.13-4: Summary of Transportation and Traffic Impacts and Mitigation

Impact	Mitigation Measure
TRANS-1. Project Related Traffic Restricts Travel Lanes	**TRANS-1.** Mitigation for Potential Impacts to Durst Organic Growers.
Source: Michael Brandman Associates 2009.	

4.14 ENERGY AND MINERAL RESOURCES

This Section addresses energy and mineral resources. It describes the environmental setting in terms of existing energy uses and mineral resources that could be affected by the proposed alignment, the regulatory setting in terms of Federal, State, and local plans that could affect the Project construction and operation, identifies significance criteria, describes any applicant proposed measures, and provides an impact analysis discussion.

4.14.1 Environmental Setting

PG&E provides electricity to all or part of 47 counties in California, constituting most of the northern and central portions of the State. In 2007, PG&E obtained 32 percent of electricity from its own generation sources and the remaining 68 percent from outside sources. PG&E-owned generating facilities include nuclear, natural gas, and hydroelectric, with a net generating capacity of more than 6,200 megawatts. Outside suppliers to PG&E include the California Department of Water Resources, irrigation districts, renewable energy suppliers, and other fossil fuel-fired suppliers. PG&E operates approximately 159,000 circuit miles of transmission and distribution lines. PG&E is interconnected with electric power systems in the Western Electricity Coordinating Council, which includes 14 western states; Alberta and British Columbia, Canada; and parts of Mexico. In 2007, PG&E delivered 86,179 gigawatt-hours of electricity to its customers.

PG&E provides natural gas to all or part of 39 counties in California, comprising most of the northern and central portions of the state. PG&E obtains more than 60 percent of its natural gas supplies from western Canada and the balance from U.S. sources. PG&E operates approximately 48,000 miles of transmission and distribution pipelines. In 2007, PG&E delivered 875 billion cubic feet (Bcf) of natural gas to its customers.

Yolo County

Yolo County is supplied and serviced by PG&E. Peak electrical loads have been increasing in recent years, and the reserve margin for Yolo's electricity supplies has been low, varying from 8 to 10 percent. Based on reserve margins, absolute supply is considered a problem for electricity. Natural gas supplies to the region are provided from Canada and the southwest United States. Significant natural gas reserves are found in Yolo County. Prices of natural gas are anticipated to rise due to Federal policies. Electricity supplies to the region are secure and prices will continue to rise. Peak period load has been increasing and currently is a major problem and will continue.

Solar, wind, biomass, and geothermal energy potential all exist in Yolo County. Yolo County uses about 22 trillion British thermal units (Btu's) per year (260 million Btu's of primary energy per person) which is about 18 percent of the energy use in the Sacramento Metropolitan Statistical Area (SMSA) and about 0.3 percent of that in the state. About half of the county's energy use is motor fuels, while 19 percent is natural gas and 12 percent goes to electrical use. Overall, the county appears to have adequate energy resources.

Yolo County has an extensive history of mining sand and gravel mineral resources in the county, as well as gold and mercury within the Cache Creek watershed. The Cache Creek Area Plan (CCAP) was adopted by the Yolo County Board of Supervisors in August 1996 and approved by County Voters in November 1996. The CCAP comprises the Off-Channel Mining Plan (OCMP), which is a mining and reclamation plan, and the Cache Creek Resources Management Plan (CCRMP), which is a creek management plan. The focus of the CCAP is groundwater protection, agricultural preservation, restoration of Cache Creek, and limitation and regulation of mining.

The alluvial deposits in the Cache Creek area are recognized as a major regional source of aggregate for the production of concrete, asphalt, and road base materials. Commercial aggregate mining occurred in the creek from the early 1900's through 1996 when the County negotiated a "trade" with mining operators of vested in-channel rights for vested off-channel rights.

The CCRMP, adopted August 20, 1996 and amended August 15, 2002, eliminated in-channel commercial mining, and established an improvement program for implementing on-going projects to improve channel stability and restore habitat along the creek banks. The CCRMP provides the policy framework for restoration of the 14.5-mile Lower Cache Creek. It includes specific implementation standards within the Cache Creek Improvement Program (CCIP). The CCIP is the implementation plan for the CCRMP that identifies categories of restoration/protection projects along a precisely defined stretch of the creek. These include bank stabilization, channel maintenance, revegetation, and habitat restoration according to identified design requirements.

The CCRMP/CCIP does allow for limited “maintenance” excavation to occur in order to restore the creek and improve creek stability over time. The adoption of the CCAP allowed the County to eliminate commercial mining activity from within the creek channel and “substitute” that activity with off-channel mining which allowed for appropriate regulated harvesting of the mineral resource deposits.

Sutter County

Local energy needs can likely be met over the short-term (5 to 10 years) without new sources of energy development. New transmission line and substation development is not necessary in the short-term to serve expected growth. The primary considerations for the siting of new cogeneration facilities is fuel availability and the access to existing transmission lines. Air quality issues pose significant regulatory and environmental constraints to the development of new cogeneration and waste to energy facilities. Sutter County has extensive natural gas resources and continued production is likely. As of November 1995, Sutter County produced approximately 5 percent of all the natural gas produced in California from 252 wells in 19 gas fields.

PG&E provides electric and gas service to Sutter County. Since 1988 there has been a steady increase in electric energy use, while over the same period natural gas has fluctuated somewhat, with a slight decrease in consumption. In 1995, Sutter County’s total electric use was 475,139,824 kilowatts and gas use was 23,093,240 therms. As population of the county increases, the demand for these energy resources will also increase. Based on discussions with PG&E by Sutter County for information for the General Plan, current gas and electric supplies at the time the General Plan was written are expected to meet demands in Sutter County for the foreseeable future. An option to augment existing electric power sources is cogeneration, and possibly waste to energy development, which is considered a subset of cogeneration. These resources have been utilized to a limited degree in Sutter County. Another feasible energy option, based on the county’s climate, is solar energy. However, technology at the time of the writing of the General Plan had not reached the level of economic feasibility needed to stimulate new facility development. Other energy types, such as wind, geothermal, and oil production, are not expected to occur at any significant levels. However, significant natural gas production is expected to continue in the county. Overall, the county appears to have adequate energy resources.

According to the California Division of Mines and Geology, the county does not contain any significant or substantial deposits of mineral resources.

Sacramento County

Sacramento County, the Sacramento Municipal Utilities District (SMUD), and PG&E are responsible for accommodating energy demand through growth planning. Energy planning includes the ready transfer of information between the County Planning Department and the utilities responsible for establishing and implementing long-term plans. According to the Energy Plan associated with the 1993 General Plan, based on past trends, annual per capita consumption of energy in Sacramento County is projected to increase from 195 million Btu's in 1975 to 266 million Btu's by 1995. This increase, combined with projected population growth, would result in an 85 percent increase in total energy consumption in the county, from 134 trillion Btu's in 1975 to approximately 248 trillion Btu's in 1995. The Energy Plan looks to numerous economic, social, environmental, and political reasons for making more efficient use of energy and for developing renewable sources to replace the dwindling supplies of fossil fuels. The Energy Plan states the possibility that with the technology now available, it is possible to obtain at least the same level of benefits from products and services with a lower investment of energy. According to the Energy Plan, 6 percent of total energy in the county comes from renewable sources (hydroelectricity). Overall, the county appears to have adequate energy resources.

According to the City of Sacramento General Plan, the area of Sacramento County where the proposed Project is located includes Mineral Resources Zone 1 (MRZ-1) and Mineral Resource Zone 3 (MRZ-3). MRZ-1 includes areas where adequate information indicated that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence. MRZ-3 includes areas containing mineral deposits, the significance of which cannot be evaluated with available data. The proposed Project is located primarily in MRZ-1 (Sacramento County 1993).

Placer County

PG&E provides electricity to Placer County (excluding the City of Roseville) and provides natural gas for commercial and residential use in Placer County, including the City of Roseville. PG&E relies on three major sources for its gas piping system: Canada, Southwestern United States, and California. Most customers directly purchase their natural gas from the utility company; however, large PG&E gas customers can purchase their gas from the supplier of their choice and pay PG&E only for the gas transportation services they actually use. Overall, the county appears to have adequate energy resources.

According to the Placer County Mineral Resource Plan, mineral deposits are widespread throughout Placer County. Known mineral resources in the County include sand, gravel, clay, gold, quartz, decomposed granite, and crushed quarry rock. Clay, stone, gold, and sand and gravel for construction aggregate were extracted as of the adoption of the Mineral Resource Plan in 1994. The Project area within Placer County does not contain any substantial mineral resource areas (Placer County 1994).

City of Roseville

The City of Roseville operates its own electric utility, Roseville Electric, with 50,000 customers. The electric system consists of transmission and generation facilities, sub-transmission and substation facilities, and distribution facilities. Roseville Electric owns and operates a 160-megawatt power plant that produces enough electricity to meet up to 40 percent of its energy needs. The natural gas-fired combined-cycle plant uses 1.4 million gallons of recycled water in the plant's energy generation and cooling processes. The city-owned utility also strives to achieve a sustainable energy future by investing in clean, renewable energy projects and energy efficiency through innovative programs including Green Roseville and Blueprint for Energy Efficiency and Solar Technology (BEST) Homes.

Mineral resources, consisting of sand and gravel, are limited and no mineral extraction operations currently exist or are anticipated to exist in the city as noted in the General Plan for the City of Roseville.

4.14.2 Regulatory Setting

Federal

There are no applicable federal regulations associated with energy and mineral resources for the Project.

State

California's Energy Efficiency Standards for Residential and Nonresidential Buildings

Title 24, Part 6, of the California Code of Regulations establishes California's Energy Efficiency Standards for Residential and Nonresidential Buildings. The standards were updated in 2005 and set a goal of reducing growth in electricity use by 478 gigawatt-hours per year (GWh/y) and growth in natural gas use by 8.8 million therms per year (therms/y). The savings attributable to new nonresidential buildings are

163.2 GWh/y of electricity savings and 0.5 million therms/y. For nonresidential buildings, the standards establish minimum energy efficiency requirements related to building envelope, mechanical systems (e.g., HVAC and water heating systems), indoor and outdoor lighting, and illuminated signs.

Division of Oil, Gas, and Geothermal Resources

The Division of Oil, Gas, and Geothermal Resources (DOGGR) within the State Department of Conservation supervises the drilling, operation, maintenance, and abandonment of oil, gas, and geothermal wells to protect the environment, public health, and safety, and encourage good conservation practices. The DOGGR collects data on the location of groundwater, oil, gas, and geothermal resources, and records the location of all drilled and abandoned wells.

California Geological Survey

The California Geological Survey within the State Department of Conservation has the responsibility to identify and assist in the utilization of mineral deposits, and to identify geological hazards, including fault locations.

Special Publication 51

California Surface Mining and Reclamation Policies and Procedures have been prepared by the State Mining and Geology Board (SMGB) in cooperation with the Office of Mine Reclamation and the California Geological Survey.

Surface Mining and Reclamation Act

The Surface Mining and Reclamation Act (SMARA), Chapter 9, Division 2 of the Public Resources Code, requires the State Mining and Geology Board to adopt State policy for the reclamation of mined lands and the conservation of mineral resources. These policies are prepared in accordance with the Administrative Procedures Act, (Government Code) and are found in California Code of Regulations, Title 14, Division 2, Chapter 8, Subchapter 1.

Local

Yolo County General Plan

The following goals, objectives, and policies related to energy resources from the Yolo County General Plan (Yolo County 2002) were considered in this analysis.

ENR 1: Energy Plan Integrated. Although the Energy Plan was not originally adopted as a part of the General Plan, many of the included policies set forth programs to be achieved by implementation of the adopted elements of the General Plan; therefore, Yolo County shall integrate the policies expressed in the Yolo County Energy Plan into this General Plan, as amended.

ENR 2: Energy Plan Part of the Yolo County General Plan. Yolo County shall include the Energy Plan as a functional part of this Yolo County General Plan, as amended, for direct application throughout the unincorporated area of the County.

ENR 3: Energy Conservation. The Yolo County Land Use Element shall be implemented to:

- Direct the pattern of land use to be compact and related to transit routes and centers and to minimize auto traffic needs;
- Require energy efficient development and structures;
- Encourage use of alternate energy sources and energy conservation in all development approvals; and
- In-fill vacant lots, redevelop urban areas, and increase urban densities, where appropriate.

Cache Creek Resource Management Plan

As discussed above, the Cache Creek Resources Management Plan, adopted August 20, 1996 and amended August 15, 2002, eliminated in-channel commercial mining, and established an improvement program for implementing on-going projects to improve channel stability and restore habitat along the creek banks. The CCRMP provides the policy framework for restoration of the 14.5-mile Lower Cache Creek. It includes specific implementation standards within the Cache Creek Improvement Program (CCIP). The CCIP is the implementation plan for the CCRMP that identifies categories of restoration/protection projects along a precisely defined stretch of the creek. These include bank stabilization, channel maintenance, revegetation, and habitat restoration according to identified design requirements.

Sutter County General Plan

The following goals, objectives and policies related to energy resources from the Sutter County General Plan (Sutter County 1996) were considered in this analysis.

> **Goal 4.G:** To conserve energy resources in Sutter County.

> **Policy 4.G-1:** The County shall encourage energy conserving land use forms and practices--such as compact, high density development projects; the provision of bikeways and pedestrian paths; proper solar orientation; and the incorporation of transit routes and facilities.

Sacramento County General Plan

The following goals and policies related to energy resources from the Sacramento County General Plan (Sacramento County 1993) were considered in this analysis.

> **Air Quality Objective:** The integration of air quality planning with the land use, transportation and energy planning processes.

> **Policy AQ-2:** Use ARB, SMAQMD and SACOG guidelines for Sacramento County facilities and operations in order to comply with mandated measures to reduce emissions from fuel consumption, energy consumption, surface coating operations, and solvent usage.

> **Policy AQ-3:** Promote optimal air quality benefits through energy conservation measures in new development.

Placer County General Plan

The following goals, objectives and policies related to energy and mineral resources from the Placer County General Plan (Placer County 1994) were considered in this analysis.

> **Goal 3.C:** To maximize the efficient use of transportation facilities so as to: 1) reduce travel demand of the County's roadway system; 2) reduce the amount of investment required in new or expanded facilities; 3) reduce the quantity of emissions of pollutants from automobiles; and 4) increase the energy-efficiency of the transportation system.

> **Policy 6.F.5:** The County shall encourage project proponents to consult early in the planning process with the County regarding the applicability of

Countywide indirect and areawide source programs and transportation control measures (TCM) programs. Project review shall also address energy efficient building and site designs and proper storage, use, and disposal of hazardous materials.

Policy 1.J.3: The County shall discourage the development of any uses that would be incompatible with adjacent mining operations or would restrict future extraction of significant mineral resources.

Policy 1.J.4: The County shall discourage the development of incompatible land uses in areas that have been identified as having potentially significant mineral resources.

City of Roseville General Plan

The following goals and policies related to energy resources from the City of Roseville General Plan (City of Roseville 2004) were considered in this analysis.

Electric Utility Goal 4: Aggressively pursue cost-effective and environmentally safe alternative sources of energy and energy conservation measures.

4.14.3 Significance Criteria

Energy

In accordance with Appendix F of the CEQA Guidelines, potentially significant energy implications of a project should be considered in an EIR. Environmental impacts may include:

1. The project's energy requirements and its energy use efficiencies by amount and fuel type for each stage of the project's life cycle including construction, operation, maintenance, and/or removal. If appropriate, the energy intensiveness of materials may be discussed.
2. The effects of the project on local and regional energy supplies and on requirements for additional capacity.
3. The effects of the project on peak and base period demands for electricity and other forms of energy.
4. The degree to which the project complies with existing energy standards.

5. The effects of the project on energy resources.

6. The project's projected transportation energy use requirements and its overall use of efficient transportation alternatives.

Minerals

An adverse impact on mineral resources is considered significant and would require mitigation if it would:

1. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the State.

2. Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

4.14.4 Applicant Proposed Measures

There are no Applicant Proposed Measures (APMs) for Energy and Mineral Resources that have been identified by PG&E in its Environmental Analysis prepared for the CSLC.

4.14.5 Impact Analysis and Mitigation

Impact Discussion

Project Life Cycle Energy Requirements

The Project would not require a significant amount of energy resources throughout the Project's life cycle. Energy use efficiencies and fuel type for each stage of the Project's life cycle (including construction, operation, maintenance, and/or removal) would not significantly affect energy resources. Impacts related to Project life cycle energy requirements are expected to be less than significant (Class III).

The operation phase of the Project would allow for the transport of additional non-renewable resources (natural gas), although the Project itself would not utilize significant amounts of non-renewable resources. The Project would result in the conveyance of natural gas to end users. Therefore, the Project would result in the off-site emissions related to natural gas usage.

The Project would facilitate movement of natural gas in southern Sutter County, Yolo County, Sacramento County, and Placer County. While the Project would facilitate the delivery of non-renewable resources, these resources would be exploited and expended now and in the near future regardless of the proposed Project as the production of natural gas that would be distributed by the Project has been, or would be, approved by permitting agencies. Therefore, impacts would be less than significant (Class III).

Local and Regional Energy Supplies

The Project would not have an adverse impact on local and regional energy supplies or on requirements for additional capacity because construction would be temporary and energy use associated with construction and operation of the proposed Project would not be significant. Impacts to energy resources are expected to be less than significant (Class III). As discussed above under Project Life Cycle Energy Requirements, construction of the Project would require fossil fuels, a nonrenewable resource, to power construction vehicles. However, construction would be temporary and energy use would not be considered significant. While the Project would facilitate the delivery of non-renewable resources, these resources would be exploited and expended now and in the near future regardless of the proposed Project as the production of natural gas that would be distributed by the Project has been, or would be, approved by permitting agencies. Therefore, impacts would be less than significant (Class III).

Energy Demand

The Project would not have an adverse impact on peak and base period demands for electricity and other forms of energy because construction would be temporary and energy use associated with construction and operation of the proposed Project would not be significant. Impacts to energy resources are expected to be less than significant (Class III). As discussed above under Project Life Cycle Energy Requirements, construction of the Project would require fossil fuels, a nonrenewable resource, to power construction vehicles. However, construction would be temporary and energy use would not be considered significant. Therefore, impacts would be less than significant (Class III).

Energy Standards

The Project would comply with existing energy standards. Impacts to energy resources are expected to be less than significant (Class III). The proposed Project would not include the construction of new structures and therefore Title 24, California's Energy Efficiency Standards for Residential and Nonresidential Buildings would not apply to this Project. The Project would not result in the inefficient, unnecessary, or wasteful consumption of energy because construction would be temporary and energy use associated with construction and operation of the proposed Project would not be significant. Therefore, impacts would be less than significant (Class III).

Energy Resources

The Project would not have an adverse impact on energy resources because the Project itself would not utilize significant amounts of non-renewable resources. The short-term energy consumption necessary for the implementation of the proposed Project would result in long-term energy benefits. Impacts to energy resources are expected to be less than significant (Class III). Construction of the Project would require fossil fuels, a nonrenewable resource, to power construction vehicles.

The operation phase of the Project would allow for the transport of additional non-renewable resources (natural gas), although the Project itself would not utilize significant amounts of non-renewable resources.

The Project would facilitate more efficient movement of natural gas in southern Sutter County, Yolo County, Sacramento County, and Placer County. As stated above, the short-term energy consumption necessary for the implementation of the proposed Project would result in long-term energy benefits including a more efficient distribution system that expends less energy than the current distribution system. While the Project would facilitate the delivery of non-renewable resources, these resources would be exploited and expended now and in the near future regardless of the proposed Project as the production of natural gas that would be distributed by the Project has been, or would be, approved by permitting agencies. Therefore, impacts would be less than significant (Class III).

Transportation Energy Use

Traffic associated with the proposed Project would not result in adverse impacts on energy resources because construction-related traffic would be minimal and operation of the proposed Project would not result in a substantial long-term increase in the number of vehicle trips. Impacts to energy resources are expected to be less than significant (Class III). As discussed in Section 4.13, Traffic and Transportation, construction of the proposed Project would result in a limited number of additional vehicles on the road by temporary construction workers. Construction and installation of the proposed pipeline would require approximately 90 to 130 workers. These workers would be dispersed over the pipeline Project. Work crews would only work on a particular segment of the pipeline for two days. Construction of the proposed Project would therefore not result in a significant increase in vehicles on the roads. Operation of the substations would not impact transportation or circulation because the stations would be unmanned facilities. While there would be occasional operation and maintenance activities, the Project would not increase the number of trips on roadways on a regular basis.

Project-related traffic would not result in a substantial long-term increase in the number of vehicle trips and thus would not result in an increase in energy use associated with transportation. Therefore, impacts would be less than significant (Class III).

Mineral Resource Valuable to Region or State

The Project would not result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the State, and therefore impacts would be less than significant (Class III). A field examination was conducted by Alvin Franks on June 9, 2008. There were no minerals found that could be affected by the construction of the proposed Project. The field examination of the material close to the roads along the Project alignment found no mineralization that could be affected by the Project as planned. Mineral resources in the Project area are limited and no economic deposits of metallic minerals are known to exist in or near the Project area. A small deposit of natural gas is known to be in the Dunnigan Hills, but not in the vicinity of the pipeline. The primary mineral resources are non-metallic mineral commodities, consisting primarily of gravel and sand, and crushed rock (Franks 2008).

Mineral Resource Recovery Site

The Project would not result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan (City of Sacramento 2006, City of Roseville 2004, Placer County 1994, Sacramento County 1993, Sutter County 1996, Yolo County 2002, 2008). Impacts would be less than significant (Class III). A field examination was conducted by Alvin Franks on June 9, 2008. There were no minerals found that could be affected by the construction of the proposed Project. The field examination of the material close to the roads along the proposed alignment found no mineralization that could be affected by the Project as planned.

4.14.6 Impacts of Alternatives

A No Project Alternative as well as twelve options have been proposed for the alignment in order to minimize or eliminate environmental impacts of the proposed project and to respond to comments from nearby landowners. The twelve options, labeled A through L, have been analyzed in comparison to the portion of the proposed route that has been avoided as a result of the option. Descriptions of the options can be found in Section 3.0, Alternatives and Cumulative Projects, and are depicted in Figure 3-2A through 3-2K.

No Project Alternative

Without the Project, there would be no temporary construction activities and no long-term transport of non-renewable resources. Thus, there would be no energy or mineral impacts.

Option A

The area through which the Option A alignment would pass has the same energy and mineral resources as the proposed Project. Energy impacts associated with Option A would be the same as the proposed Project because Option A would consist of the construction of a natural gas pipeline in the same area as the proposed Project. There are not any mineral resources to be avoided along the Option A portion of the proposed alignment; therefore, there would be no change in impacts regarding protection of mineral resources. There would not be a change in the magnitude of impacts for any of the significance criteria. Option A would not require a significant amount of energy resources throughout the Project's life cycle since, while the Project would require fossil fuels and would allow for the transport of additional nonrenewable resources (natural gas), the Project itself would not utilize significant amounts of non-renewable resources. Nor would Option A adversely affect local and regional energy supplies or requirements for additional capacity since construction would be temporary and the resources delivered by Option A would be exploited and expended regardless of the Project. Nor would Option A adversely affect peak and base period demands for electricity and other forms of energy since construction would be temporary and thus fossil fuels associated with construction would be limited. Option A would comply with existing energy standards and would not adversely affect energy resources. Traffic associated with Option A would not adversely affect energy resources since the Project would result in only a limited number of construction workers and would not increase the number of trips on roadways on a regular basis during Project operation. Option A would not result in the loss of availability of a known mineral resources that would be of value to the region and the residents of the state, nor would Option A result in the loss of availability of a locally-important mineral resources recovery site delineated on a local general plan, specific plan or other land use plan. No significant mineral resources are located in the Project area that could be affected by the construction of Option A. Therefore, all impacts would remain the same as the proposed Project under Option A.

Option B

The area through which the Option B alignment would pass has the same energy and mineral resources as the proposed Project. Energy impacts associated with Option B would be the same as the proposed Project because Option B would consist of the construction of a natural gas pipeline in the same area as the proposed Project. There are not any mineral resources to be avoided along the Option B portion of the proposed alignment; therefore, there would be no change in impacts regarding protection of mineral resources. There would not be a change in the magnitude of impacts for any of the significance criteria. Option B would not require a significant amount of energy resources throughout the Project’s life cycle since, while the Project would require fossil fuels and would allow for the transport of additional nonrenewable resources (natural gas), the Project itself would not utilize significant amounts of non-renewable resources. Nor would Option B adversely affect local and regional energy supplies or requirements for additional capacity since construction would be temporary and the resources delivered by Option B would be exploited and expended regardless of the Project. Nor would Option B adversely affect peak and base period demands for electricity and other forms of energy since construction would be temporary and thus fossil fuels associated with construction would be limited. Option B would comply with existing energy standards and would not adversely affect energy resources. Traffic associated with Option B would not adversely affect energy resources since the Project would result in only a limited number of construction workers and would not increase the number of trips on roadways on a regular basis during Project operation. Option B would not result in the loss of availability of a known mineral resources that would be of value to the region and the residents of the state, nor would Option B result in the loss of availability of a locally-important mineral resources recovery site delineated on a local general plan, specific plan or other land use plan. No significant mineral resources are located in the Project area that could be affected by the construction of Option B. Therefore, all impacts would remain the same as the proposed Project under Option B.

Option C

The area through which the Option C alignment would pass has the same energy and mineral resources as the proposed Project. Energy impacts associated with Option C would be the same as the proposed Project because Option C would consist of the construction of a natural gas pipeline in the same area as the proposed Project. There are not any mineral resources to be avoided along the Option C portion of the proposed alignment; therefore, there would be no change in impacts regarding protection of mineral resources. There would not be a change in the magnitude of impacts for any of the significance criteria. Option C would not require a significant amount of energy resources throughout the Project's life cycle since, while the Project would require fossil fuels and would allow for the transport of additional nonrenewable resources (natural gas), the Project itself would not utilize significant amounts of non-renewable resources. Nor would Option C adversely affect local and regional energy supplies or requirements for additional capacity since construction would be temporary and the resources delivered by Option C would be exploited and expended regardless of the Project. Nor would Option C adversely affect peak and base period demands for electricity and other forms of energy since construction would be temporary and thus fossil fuels associated with construction would be limited. Option C would comply with existing energy standards and would not adversely affect energy resources. Traffic associated with Option C would not adversely affect energy resources since the Project would result in only a limited number of construction workers and would not increase the number of trips on roadways on a regular basis during Project operation. Option C would not result in the loss of availability of a known mineral resources that would be of value to the region and the residents of the state, nor would Option C result in the loss of availability of a locally-important mineral resources recovery site delineated on a local general plan, specific plan or other land use plan. No significant mineral resources are located in the Project area that could be affected by the construction of Option C. Therefore, all impacts would remain the same as the proposed Project under Option C.

Option D

The area through which the Option D alignment would pass has the same energy and mineral resources as the proposed Project. Energy impacts associated with

Option D would be the same as the proposed Project because Option D would consist of the construction of a natural gas pipeline in the same area as the proposed Project. There are not any mineral resources to be avoided along the Option D portion of the proposed alignment; therefore, there would be no change in impacts regarding protection of mineral resources. There would not be a change in the magnitude of impacts for any of the significance criteria. Option D would not require a significant amount of energy resources throughout the Project's life cycle since, while the Project would require fossil fuels and would allow for the transport of additional nonrenewable resources (natural gas), the Project itself would not utilize significant amounts of non-renewable resources. Nor would Option D adversely affect local and regional energy supplies or requirements for additional capacity since construction would be temporary and the resources delivered by Option D would be exploited and expended regardless of the Project. Nor would Option D adversely affect peak and base period demands for electricity and other forms of energy since construction would be temporary and thus fossil fuels associated with construction would be limited. Option D would comply with existing energy standards and would not adversely affect energy resources. Traffic associated with Option D would not adversely affect energy resources since the Project would result in only a limited number of construction workers and would not increase the number of trips on roadways on a regular basis during Project operation. Option D would not result in the loss of availability of a known mineral resources that would be of value to the region and the residents of the state, nor would Option D result in the loss of availability of a locally-important mineral resources recovery site delineated on a local general plan, specific plan or other land use plan. No significant mineral resources are located in the Project area that could be affected by the construction of Option D. Therefore, all impacts would remain the same as the proposed Project under Option D.

Option E

The area through which the Option E alignment would pass has the same energy and mineral resources as the proposed Project. Energy impacts associated with Option E would be the same as the proposed Project because Option E would consist of the construction of a natural gas pipeline in the same area as the proposed Project. There are not any mineral resources to be avoided along the Option E portion of the proposed alignment; therefore, there would be no change in impacts regarding protection of mineral resources. There would not be a change in the magnitude of impacts for any of the significance criteria. Option E would not require a significant amount of energy resources throughout the Project's life cycle since, while the Project would require fossil fuels and would allow for the transport of additional nonrenewable resources (natural gas), the Project itself would not utilize significant amounts of non-renewable resources. Nor would Option E adversely affect local and regional energy supplies or requirements for additional capacity since construction would be temporary and the resources delivered by Option E would be exploited and expended regardless of the Project. Nor would Option E adversely affect peak and base period demands for electricity and other forms of energy since construction would be temporary and thus fossil fuels associated with construction would be limited. Option E would comply with existing energy standards and would not adversely affect energy resources. Traffic associated with Option E would not adversely affect energy resources since the Project would result in only a limited number of construction workers and would not increase the number of trips on roadways on a regular basis during Project operation. Option E would not result in the loss of availability of a known mineral resources that would be of value to the region and the residents of the state, nor would Option E result in the loss of availability of a locally-important mineral resources recovery site delineated on a local general plan, specific plan or other land use plan. No significant mineral resources are located in the Project area that could be affected by the construction of Option E. Therefore, all impacts would remain the same as the proposed Project under Option E.

Option F

The area through which the Option F alignment would pass has the same energy and mineral resources as the proposed Project. Energy impacts associated with Option F would be the same as the proposed Project because Option F would consist of the construction of a natural gas pipeline in the same area as the proposed Project. There are not any mineral resources to be avoided along the Option F portion of the proposed alignment; therefore, there would be no change in impacts regarding protection of mineral resources. There would not be a change in the magnitude of impacts for any of the significance criteria. Option F would not require a significant amount of energy resources throughout the Project's life cycle since, while the Project would require fossil fuels and would allow for the transport of additional nonrenewable resources (natural gas), the Project itself would not utilize significant amounts of non-renewable resources. Nor would Option F adversely affect local and regional energy supplies or requirements for additional capacity since construction would be temporary and the resources delivered by Option F would be exploited and expended regardless of the Project. Nor would Option F adversely affect peak and base period demands for electricity and other forms of energy since construction would be temporary and thus fossil fuels associated with construction would be limited. Option F would comply with existing energy standards and would not adversely affect energy resources. Traffic associated with Option F would not adversely affect energy resources since the Project would result in only a limited number of construction workers and would not increase the number of trips on roadways on a regular basis during Project operation. Option F would not result in the loss of availability of a known mineral resources that would be of value to the region and the residents of the state, nor would Option F result in the loss of availability of a locally-important mineral resources recovery site delineated on a local general plan, specific plan or other land use plan. No significant mineral resources are located in the Project area that could be affected by the construction of Option F. Therefore, all impacts would remain the same as the proposed Project under Option F.

Option G

The area through which the Option G alignment would pass has the same energy and mineral resources as the proposed Project. Energy impacts associated with Option G would be the same as the proposed Project because Option G would consist of the construction of a natural gas pipeline in the same area as the proposed Project. There are not any mineral resources to be avoided along the Option G portion of the proposed alignment; therefore, there would be no change in impacts regarding protection of mineral resources. There would not be a change in the magnitude of impacts for any of the significance criteria. Option G would not require a significant amount of energy resources throughout the Project's life cycle since, while the Project would require fossil fuels and would allow for the transport of additional nonrenewable resources (natural gas), the Project itself would not utilize significant amounts of non-renewable resources. Nor would Option G adversely affect local and regional energy supplies or requirements for additional capacity since construction would be temporary and the resources delivered by Option G would be exploited and expended regardless of the Project. Nor would Option G adversely affect peak and base period demands for electricity and other forms of energy since construction would be temporary and thus fossil fuels associated with construction would be limited. Option G would comply with existing energy standards and would not adversely affect energy resources. Traffic associated with Option G would not adversely affect energy resources since the Project would result in only a limited number of construction workers and would not increase the number of trips on roadways on a regular basis during Project operation. Option G would not result in the loss of availability of a known mineral resources that would be of value to the region and the residents of the state, nor would Option G result in the loss of availability of a locally-important mineral resources recovery site delineated on a local general plan, specific plan or other land use plan. No significant mineral resources are located in the Project area that could be affected by the construction of Option G. Therefore, all impacts would remain the same as the proposed Project under Option G.

Option H

The area through which the Option H alignment would pass has the same energy and mineral resources as the proposed Project. Energy impacts associated with Option H would be the same as the proposed Project because Option H would consist of the construction of a natural gas pipeline in the same area as the proposed Project. There are not any mineral resources to be avoided along the Option H portion of the proposed alignment; therefore, there would be no change in impacts regarding protection of mineral resources. There would not be a change in the magnitude of impacts for any of the significance criteria. Option H would not require a significant amount of energy resources throughout the Project's life cycle since, while the Project would require fossil fuels and would allow for the transport of additional nonrenewable resources (natural gas), the Project itself would not utilize significant amounts of non-renewable resources. Nor would Option H adversely affect local and regional energy supplies or requirements for additional capacity since construction would be temporary and the resources delivered by Option H would be exploited and expended regardless of the Project. Nor would Option H adversely affect peak and base period demands for electricity and other forms of energy since construction would be temporary and thus fossil fuels associated with construction would be limited. Option H would comply with existing energy standards and would not adversely affect energy resources. Traffic associated with Option H would not adversely affect energy resources since the Project would result in only a limited number of construction workers and would not increase the number of trips on roadways on a regular basis during Project operation. Option H would not result in the loss of availability of a known mineral resources that would be of value to the region and the residents of the state, nor would Option H result in the loss of availability of a locally-important mineral resources recovery site delineated on a local general plan, specific plan or other land use plan. No significant mineral resources are located in the Project area that could be affected by the construction of Option H. Therefore, all impacts would remain the same as the proposed Project under Option H.

Option I

The area through which the Option I alignment would pass has the same energy and mineral resources as the proposed Project. Energy impacts associated with Option I would be the same as the proposed Project because Option I would consist of the construction of a natural gas pipeline in the same area as the proposed Project. There are not any mineral resources to be avoided along the Option I portion of the proposed alignment; therefore, there would be no change in impacts regarding protection of mineral resources. There would not be a change in the magnitude of impacts for any of the significance criteria. Option I would not require a significant amount of energy resources throughout the Project's life cycle since, while the Project would require fossil fuels and would allow for the transport of additional nonrenewable resources (natural gas), the Project itself would not utilize significant amounts of non-renewable resources. Nor would Option I adversely affect local and regional energy supplies or requirements for additional capacity since construction would be temporary and the resources delivered by Option I would be exploited and expended regardless of the Project. Nor would Option I adversely affect peak and base period demands for electricity and other forms of energy since construction would be temporary and thus fossil fuels associated with construction would be limited. Option I would comply with existing energy standards and would not adversely affect energy resources. Traffic associated with Option I would not adversely affect energy resources since the Project would result in only a limited number of construction workers and would not increase the number of trips on roadways on a regular basis during Project operation. Option I would not result in the loss of availability of a known mineral resources that would be of value to the region and the residents of the state, nor would Option I result in the loss of availability of a locally-important mineral resources recovery site delineated on a local general plan, specific plan or other land use plan. No significant mineral resources are located in the Project area that could be affected by the construction of Option I. Therefore, all impacts would remain the same as the proposed Project under Option I.

Option J

The area through which the Option J alignment would pass has the same energy and mineral resources as the proposed Project. Energy impacts associated with Option J would be the same as the proposed Project because Option J would consist of the construction of a natural gas pipeline in the same area as the proposed Project. There are not any mineral resources to be avoided along the Option J portion of the proposed alignment; therefore, there would be no change in impacts regarding protection of mineral resources. There would not be a change in the magnitude of impacts for any of the significance criteria. Option J would not require a significant amount of energy resources throughout the Project's life cycle since, while the Project would require fossil fuels and would allow for the transport of additional nonrenewable resources (natural gas), the Project itself would not utilize significant amounts of non-renewable resources. Nor would Option J adversely affect local and regional energy supplies or requirements for additional capacity since construction would be temporary and the resources delivered by Option J would be exploited and expended regardless of the Project. Nor would Option J adversely affect peak and base period demands for electricity and other forms of energy since construction would be temporary and thus fossil fuels associated with construction would be limited. Option J would comply with existing energy standards and would not adversely affect energy resources. Traffic associated with Option J would not adversely affect energy resources since the Project would result in only a limited number of construction workers and would not increase the number of trips on roadways on a regular basis during Project operation. Option J would not result in the loss of availability of a known mineral resources that would be of value to the region and the residents of the state, nor would Option J result in the loss of availability of a locally-important mineral resources recovery site delineated on a local general plan, specific plan or other land use plan. No significant mineral resources are located in the Project area that could be affected by the construction of Option J. Therefore, all impacts would remain the same as the proposed Project under Option J.

Option K

The area through which the Option K alignment would pass has the same energy and mineral resources as the proposed Project. Energy impacts associated with Option K would be the same as the proposed Project because Option K would consist of the construction of a natural gas pipeline in the same area as the proposed Project. There are not any mineral resources to be avoided along the

Option K portion of the proposed alignment; therefore, there would be no change in impacts regarding protection of mineral resources. There would not be a change in the magnitude of impacts for any of the significance criteria. Option K would not require a significant amount of energy resources throughout the Project's life cycle since, while the Project would require fossil fuels and would allow for the transport of additional nonrenewable resources (natural gas), the Project itself would not utilize significant amounts of non-renewable resources. Nor would Option K adversely affect local and regional energy supplies or requirements for additional capacity since construction would be temporary and the resources delivered by Option K would be exploited and expended regardless of the Project. Nor would Option K adversely affect peak and base period demands for electricity and other forms of energy since construction would be temporary and thus fossil fuels associated with construction would be limited. Option K would comply with existing energy standards and would not adversely affect energy resources. Traffic associated with Option K would not adversely affect energy resources since the Project would result in only a limited number of construction workers and would not increase the number of trips on roadways on a regular basis during Project operation. Option K would not result in the loss of availability of a known mineral resources that would be of value to the region and the residents of the state, nor would Option K result in the loss of availability of a locally-important mineral resources recovery site delineated on a local general plan, specific plan or other land use plan. No significant mineral resources are located in the Project area that could be affected by the construction of Option K. Therefore, all impacts would remain the same as the proposed Project under Option K.

Option L

The area through which the Option L alignment would pass has the same energy and mineral resources as the proposed Project. Energy impacts associated with Option L would be the same as the proposed Project because Option L would consist of the construction of a natural gas pipeline in the same area as the proposed Project. There are not any mineral resources to be avoided along the Option L portion of the proposed alignment; therefore, there would be no change in impacts regarding protection of mineral resources. There would not be a change in the magnitude of impacts for any of the significance criteria. Option L would not require a significant amount of energy resources throughout the Project's life cycle since, while the Project would require fossil fuels and would allow for the transport of additional nonrenewable resources (natural gas), the Project itself would not utilize significant amounts of non-renewable resources. Nor would Option L adversely affect local and regional energy supplies or requirements for additional capacity since construction would be temporary and the resources delivered by Option L would be exploited and expended regardless of the Project. Nor would Option L adversely affect peak and base period demands for electricity and other forms of energy since construction would be temporary and thus fossil fuels associated with construction would be limited. Option L would comply with existing energy standards and would not adversely affect energy resources. Traffic associated with Option L would not adversely affect energy resources since the Project would result in only a limited number of construction workers and would not increase the number of trips on roadways on a regular basis during Project operation. Option L would not result in the loss of availability of a known mineral resources that would be of value to the region and the residents of the state, nor would Option L result in the loss of availability of a locally-important mineral resources recovery site delineated on a local general plan, specific plan or other land use plan. No significant mineral resources are located in the Project area that could be affected by the construction of Option L. Therefore, all impacts would remain the same as the proposed Project under Option L.

Table 4.14-1: Comparison of Alternatives for Energy and Minerals

Alternative	Comparison with Proposed Project
No Project	No Impacts
Option A	Similar Impacts
Option B	Similar Impacts
Option C	Similar Impacts
Option D	Similar Impacts
Option E	Similar Impacts
Option F	Similar Impacts
Option G	Similar Impacts
Option H	Similar Impacts
Option I	Similar Impacts
Option J	Similar Impacts
Option K	Similar Impacts
Option L	Similar Impacts
Source: Michael Brandman Associates 2009.	

4.14.7 Cumulative Projects Impact Analysis

The construction of other projects in the vicinity of the proposed Project could cumulatively affect energy resources. Future projects considered in the cumulative projects impact analysis are listed in Table 3-2.

Although these other projects would consume additional energy resources, they were all anticipated in various General Plans, and each will be required to prepare a Utilities and Service systems analysis that demonstrates there are sufficient natural gas and electricity resources to meet Project needs. When considered with other past, present, and reasonably foreseeable projects the proposed Project would not result in any long-term impacts on energy resources, and would therefore not be cumulatively considerable. Cumulative impacts on energy resources would be less than significant (Class III).

4.14.8 Summary of Impacts and Mitigation Measures

Since the Project would not require a significant amount of energy resources throughout the Project's life cycle, it would not have an adverse impact on local and regional energy supplies or on requirements for additional capacity; would not have an adverse impact on peak and base period demands for electricity and other forms of energy; would comply with existing energy standards; would not have an adverse impact on energy resources; would not result in traffic that affects energy resources; and would not result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state. No mitigation measures have been proposed.

5.0 ENVIRONMENTAL JUSTICE

This Section analyzes the distributional patterns of high-minority and low-income populations on a regional basis and characterizes the distribution of such populations adjacent to the proposed and alternative pipeline corridors. This analysis focuses on whether the proposed Project has the potential to adversely and disproportionately affect minority populations and low-income communities, thus creating an inconsistency with the intent of the California State Lands Commission (CSLC) environmental justice policy.

5.1 BACKGROUND

On February 11, 1994, President Clinton issued an "Executive Order on Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" designed to focus attention on environmental and human health conditions in areas of high minority populations and low-income communities, and promote non-discrimination in programs and projects substantially affecting human health and the environment (White House 1994). The order requires the U.S. Environmental Protection Agency (EPA) and all other Federal agencies (as well as State agencies receiving Federal funds) to develop strategies to address this issue. The agencies are required to identify and address any disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and/or low-income populations.

5.2 CALIFORNIA STATE LANDS COMMISSION POLICY

The CSLC has developed and adopted an Environmental Justice Policy to ensure equity and fairness in its own processes and procedures. The CSLC adopted an amended Environmental Justice Policy on October 1, 2002, to ensure that "Environmental Justice is an essential consideration in the CSLC's processes, decisions and programs and that all people who live in California have a meaningful way to participate in these activities." The policy stresses equitable treatment of all members of the public and commits to consider environmental justice in its processes, decision-making, and regulatory affairs, which is implemented, in part, through identification of, and communication with, relevant populations that could be adversely and disproportionately affected by CSLC projects or programs. This discussion is provided in this document consistent with and in furtherance of the CSLC's Environmental Justice Policy. The staff of the CSLC is required to report to the CSLC on how environmental justice is integrated into its programs, processes, and activities (CSLC 2002).

5.3 SETTING

Regional and local environmental justice assessments have been performed by agencies within the Project area, such as the Sacramento Area Council of Government's 2006 Metropolitan Transportation Plan (MTP). Analysis within the MTP is specific to transportation planning and addresses the effects of transportation activities on minority and low-income populations. The methods applied in this discussion are the same as those used in the MTP report.

The proposed Project would be located within a total of 11 U.S. Census Block Groups in Yolo, Sutter, Sacramento, and Placer Counties. Racial diversity and income levels for residents within these counties were obtained from 2000 U.S. Census data. A summary of this information for the affected counties and for the State of California is provided in Table 5-1 and Table 5-2. As shown in these tables, counties within the Project area have significantly lower minority populations than the statewide average. The annual per capita income in Placer County is higher than the statewide average, while Sacramento, Sutter, and Yolo counties all have a lower than average annual per capita income. Both Yolo and Sutter counties have a higher percentage of the population below poverty level than the statewide average while Sacramento County has a similar rate and Placer County's rate is significantly lower.

Table 5-1: Summary of Census 2000 Demographics of Affected Counties and California

County	Total Population	Percent Minority[1]	Annual per Capita Income ($) (1999)	Percent Below Poverty Level	Percent Age 65 or Above
Yolo	168,660	41.9	19,365	18.4	9.4
Sutter	78,930	39.8	17,428	15.5	12.4
Sacramento	1,223,499	42.2	21,142	14.1	11.1
Placer	248,399	16.6	27,963	5.8	13.1
Total for California	33,871,648	53.3	22,711	14.2	10.6

Notes:
[1] For purposes of this study, minority population calculations included all Hispanic or Latino origin and all other persons of non-white racial origin.
Source: US Census Bureau, Census 2000, Summary File 1 (SF 1), Summary File 3 (SF 3) and Table P-8.

Table 5-2: Summary of Census 2000 Race and Ethnicity Demographics for Project Area

County	Total Population	Percent White[1]	Percent Black or African American	Percent American Indian and Alaska Native	Percent Asian	Percent Native Hawaiian & other Pacific Islander	Percent some other Race	Percent two or more Races	Percent Hispanic or Latino (of any race)	Percent Minority
Yolo	168,660	67.7	2.0	1.2	9.9	0.3	13.8	5.2	25.9	41.9
Sutter	78,930	67.5	1.9	1.6	11.3	0.2	13.0	4.6	22.2	39.8
Sacramento	1,223,499	64	10.0	1.1	11.0	0.6	7.5	5.8	16.0	42.2
Placer	248,399	88.6	0.8	0.9	2.9	0.2	3.4	3.2	9.7	16.6
Total for California	33,871,648	59.5	6.7	1.0	10.9	0.3	16.8	4.7	32.4	53.3

Notes:
[1]For purposes of this study, minority population calculations included all Hispanic or Latino origin and all other persons of non-white racial origin.
Source: US Census Bureau, Census 2000, Summary File 1 (SF 1) Table P-7 and Table P-8.

5.4 POLICY ISSUES

An inconsistency with the environmental justice policy would occur if the proposed Project would:

1. Have the potential to disproportionately affect minority and/or low income populations in areas in which the Project is located; or

2. Result in a substantial disproportionate decrease in the employment and economic base of minority and/or low income populations residing in the County and/or immediately surrounding cities.

For this discussion, an area of 1,000 feet, centered on the proposed pipeline alignment, was used to determine possibly affected communities. The potential affected area was identified based on previously completed environmental justice analyses for similar natural gas pipeline projects. This area encompasses both construction-related affects on nearby populations as well as the potentially affected area in the unlikely event of a rupture and explosion of the pipeline.

5.4.1 Potentially Affected Populations

Potential affects on minority and low-income populations within 1,000 feet of the Project area are discussed below. Evaluation of such populations is based on the SACOG environmental justice analysis for their MTP. SACOG's analysis is based on U.S. Bureau of the Census, Census 2000 data. The Project's area of potential affect crosses 11 block groups including five in Yolo County, two in Sutter County, three in Placer County, and one in Sacramento County. Approximately 13,762 people reside within these 11 block groups. The population of each block group is shown in Table 5-3.

Table 5-3: Block Group Population

Block Group in Project Area	Total Population 2000
Yolo County	
Census Tract 101.02, Block Group 4	564
Census Tract 112.06, Block Group 1	739
Census Tract 114.00, Block Group 1	539
Census Tract 114.00, Block Group 4	1,301
Census Tract 115.00, Block Group 2	771

Block Group in Project Area	Total Population 2000
Sutter County	
Census Tract 511.00, Block Group 3	363
Census Tract 511.00, Block Group 4	851
Sacramento County	
Census Tract 71.00, Block Group 2	220
Placer County	
Census Tract 209.02, Block Group 1	1,053
Census Tract 210.07, Block Group 2	6,349
Census Tract 213.01, Block Group 2	1,012
Source: U.S. Census Bureau, Census 2000.	

Potential environmental justice areas of concern were identified in SACOG's MTP by comparing the average minority and low-income populations of each block group within the Sacramento area counties to threshold values determined by those county's averages.

Low-Income Populations

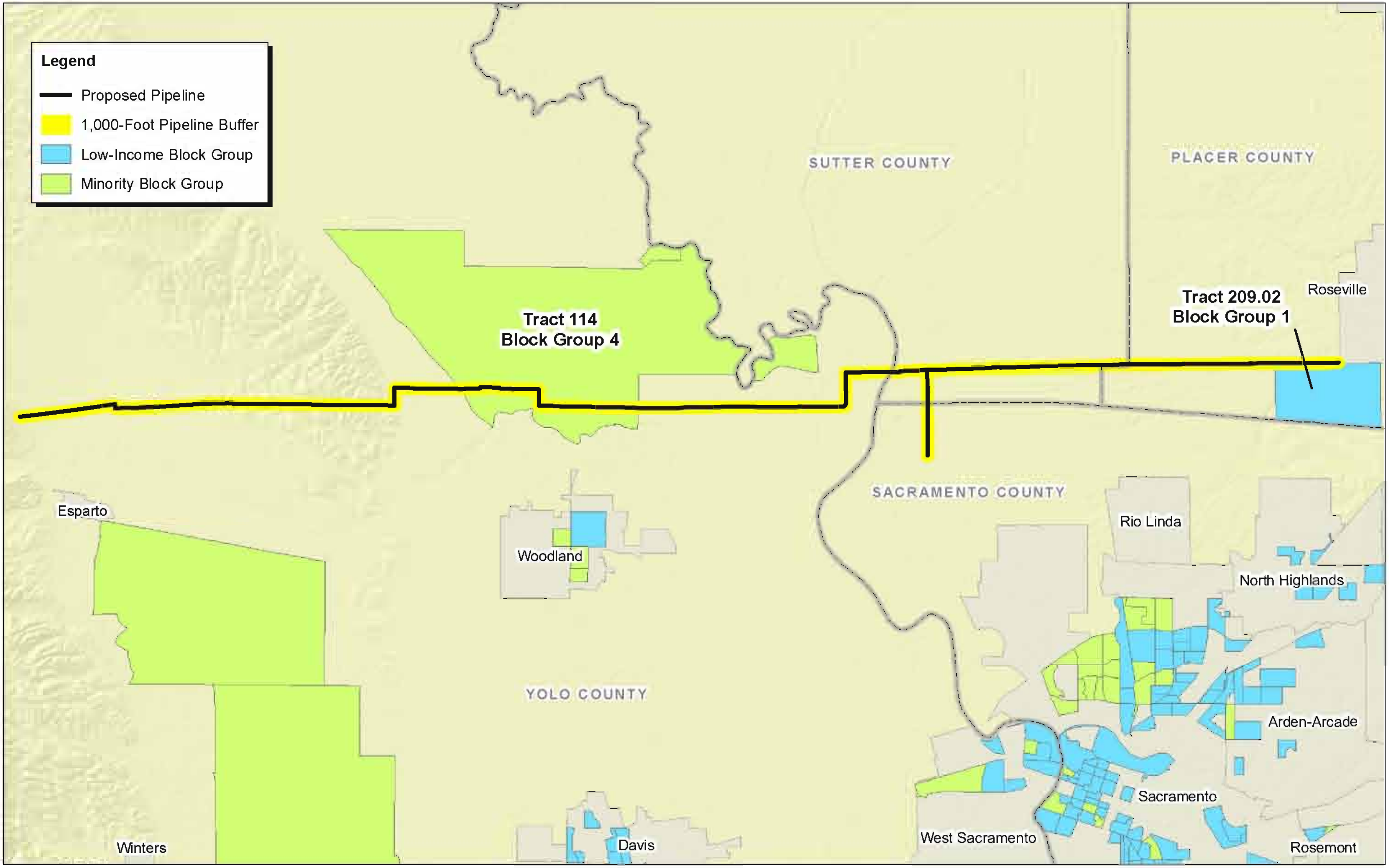
The 11 block groups potentially affected by the proposed Project have an average percentage of population below poverty level of 10.6 percent, which is lower than the combined counties average of 13.5 percent. The average per capita income for the 11 affected block groups is $21,510, which is slightly higher than the average per capita income of $21,475 for the four counties in which they reside. As such, the 11 block groups have an overall higher than average income and lower than average poverty rate.

Block groups with potentially significant low-income populations are those with more than 50 percent of households earning less than one-half of the respective county's median household income. Additionally, a potentially affected low-income area must contain residential buildings within the potential affected area in order to be identified. According to SACOG's data, Block Group 1, Census Tract 209.02 in Placer County contains a low-income population within the Project's area of affect (refer to figure 4.15-1). As shown in Table 5-4, approximately seven households are located within the Project's area of affect in this block group.

1 **Table 5-4: Low-Income Populations in Project Area**

Block Group in Potential Affected Area	Total Population 2000	Median Household Income ($) (1999)[1]	Number of Residential Buildings within Potential Affected Area[2]	Contains Significant Low-Income Populations Potentially in Project Affected Area[3]
Yolo County		40,769		
Census Tract 101.02, Block Group 4	564	35,774	1	No
Census Tract 112.06, Block Group 1	739	46,875	3	No
Census Tract 114.00, Block Group 1	539	37,361	8	No
Census Tract 114.00, Block Group 4	1,301	31,696	18	No
Census Tract 115.00, Block Group 2	771	42,431	1	No
Sutter		38,375		
Census Tract 511.00, Block Group 3	363	47,188	8	No
Census Tract 511.00, Block Group 4	851	40,417	7	No
Sacramento		43,816		
Census Tract 71.00, Block Group 2	220	85,247	0	No
Placer		57,535		
Census Tract 209.02, Block Group 1	1,053	35,813	7	Yes
Census Tract 210.07, Block Group 2	6,349	68,028	13	No
Census Tract 213.01, Block Group 2	1,012	52,500	37	No

Notes:
1 From Census 2000 Summary File 3.
2 The Potential Affected Area is determined by a 1,000-foot area of affect centered on the pipeline. The count of residential buildings within this area is based on Google earth aerial photos, accessed in April 2008 and observations during a May 2008 site visit.
3 Block Groups with potentially significant low-income populations are those containing populations of more than 50 percent earning less than one-half of the respective county's median household income. Calculation of these data were performed by SACOG and are not reflected in this table.
Source: U.S. Census Bureau, Census 2000, Michael Brandman Associates 2008, SACOG 2006.



Source: PG&E 2009, SACOG 2006, MBA 2009.

Michael Brandman Associates

Figure 5-1
Environmental Justice Communities

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Minority Populations

Table 5-5 shows the Census Block Group minority populations within the Project area as compared to the minority populations for counties in which they reside. The average minority population for the 11 block groups is 31.5 percent while the average minority population for the four counties in which they are located is 35.1 percent. As such, combined average minority populations within the 11 block groups are lower than the combined counties' averages.

Block groups with high-minority populations are those with white/non-Hispanic populations equal to or less than 35 percent of the total block group population or conversely, minority populations of more than 65 percent. According to SACOG data, the only minority population within the Project's area of affect is Block Group 4, Census Tract 114 in Yolo County (refer to Figure 4-15.1). Approximately 18 households are located within the Project's area of affect in this block group.

Table 5-5: Block Group Minority Populations in Potential Project Areas

Tracts in Project Area	Total Population 2000	Minority Population	Percent Minority[1]	Number of Residential Buildings within Potential Affected Area[2]	Contains Significant Minority Populations Potentially in Project Affected Area[3]
Yolo County	168,660	70,718	41.9		
Census Tract 101.02, Block Group 4	564	316	56.0	1	No
Census Tract 112.06, Block Group 1	739	333	45.1	3	No
Census Tract 114.00, Block Group 1	539	167	31.0	8	No
Census Tract 114.00, Block Group 4	1,301	795	61.1	18	Yes
Census Tract 115.00, Block Group 2	771	262	34.0	1	No
Sutter	78,930	31,398	39.8		
Census Tract 511.00, Block Group 3	363	105	28.9	8	No
Census Tract 511.00, Block Group 4	851	173	20.3	7	No
Sacramento	1,223,499	516,844	42.2		

Tracts in Project Area	Total Population 2000	Minority Population	Percent Minority[1]	Number of Residential Buildings within Potential Affected Area[2]	Contains Significant Minority Populations Potentially in Project Affected Area[3]
Census Tract 71.00, Block Group 2	220	48	21.8	0	No
Placer	248,399	41,163	16.6		
Census Tract 209.02, Block Group 1	1,053	117	11.1	7	No
Census Tract 210.07, Block Group 2	6,349	1297	20.4	13	No
Census Tract 213.01, Block Group 2	1,012	166	16.4	37	No

Notes:
[1] Data shown in this table are calculated from Census 2000 Data. SACOG used this data to project future population, and thereby minority populations, for the 2006 MTP. As such, the percent minority for each block group reflected in the table is slightly less than what is reflected in the 2006 MTP.
[2] The Potential Affected Area is determined by a 1,000-foot area of affect centered on the pipeline. The count of residential buildings within this area is based on Google earth aerial photos, accessed in April 2008 and observations during a May 2008 site visit.
[3] Block groups with potentially significant low-income populations are identified if those block groups contain white/non-Hispanic populations equal to or less than 35 percent of the total block group population or conversely, minority populations of more than 65 percent. Calculation of these data were performed by SACOG and are not reflected in this table.
Source: US Census Bureau, Census 2000, Summary File 1 & 3, Table P-8.

As summarized in Table 5-6, approximately 103 residences are located within the potential affected area of the Project. Of the 103 residences, 18 (17 percent) are located in a block group with a significant minority population and 7 (6 percent) are located in a block group containing low-income populations. This represents a relatively small portion of residences potentially affected by the Project.

Table 5-6: Summary of Block Groups with Significantly Low-Income or Minority Populations

Census	Number of Residential buildings within Potential Affected Area	Contains Significant Low-Income Populations Potentially in Project Affected Area	Contains Significant Minority Populations Potentially in Project Affected Area
Yolo County			
Census Tract 101.02, Block Group 4	1	No	No
Census Tract 112.06, Block Group 1	3	No	No
Census Tract 114.00, Block Group 1	8	No	No
Census Tract 114.00, Block Group 4	18	No	Yes
Census Tract 115.00, Block Group 2	1	No	No
Sutter			
Census Tract 511.00, Block Group 3	8	No	No
Census Tract 511.00, Block Group 4	7	No	No
Sacramento			
Census Tract 71.00, Block Group 2	0	No	No
Placer			
Census Tract 209.02, Block Group 1	7	Yes	No
Census Tract 210.07, Block Group 2	13	No	No
Census Tract 213.01, Block Group 2	37	No	No
Total Population/Affected Block Groups	103	1	1
Source: Michael Brandman Associates 2009.			

5.4.2 Policy Analysis and Conditions

Disproportionately Affect Populations

The Project would not have a potential to disproportionately affect minority and/or low income populations in areas in which the Project is located. The two resource areas discussed below resulted in affects to populations in the Project area. However, the resulting affects from Project implementation would be evenly dispersed along the entire length of the pipeline. The Project would be consistent with the CSLC Environmental Justice Policy.

Air Quality. Construction emissions resulting from Project implementation would exceed quantitative significance thresholds as defined by air pollution control districts/air quality management districts in which the Project would be constructed. Other affects would occur to air quality due to Project emissions exceeding State or federal ambient air quality standards. These affects would have the potential to contribute to unhealthy air quality situations throughout the entire Project area. As such, low-income or minority populations would not be disproportionately affected.

Hazards and Hazardous Materials. The Project would expose people to an unacceptable risk of existing or potential hazards, including upset and accident conditions involving the risk of fires, including wildland fires, explosions, or the release of hazardous materials into the environment. Similar affects would result from the creation of a hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. A majority of the pipeline would be located in agricultural lands containing low densities of population. Risk of upset or explosion of the pipeline is equal for the entire length of the pipeline and would not disproportionately impact a low-income or minority area. Furthermore, U.S. DOT class designations were identified based on population density with more stringent safety regulations as the human population density increases with Class I as the least dense and Class 4 as the densest. The proposed pipeline facilities would be constructed in areas which are presently within Class 1, 2, and 3 locations. A portion of the identified minority block group contains a Class 2 area of approximately 15 rural residences. The identified low-income block group contains a portion of a Class 2 area. In the case of Class 2 areas, the pipeline must adhere to stricter design measures, including more soil coverage, greater pipe wall thickness and increased frequency of pipeline patrols and surveys in order to increase safety, as compared to Class 1 areas. As such, the Class 2 areas of the minority or low-income block groups would not be disproportionately affected.

Substantial Disproportionate Decrease in Employment or Economic Base

The Project would not result in a substantial disproportionate decrease in the employment and economic base of minority and/or low-income populations residing in the county and/or immediately surrounding cities. Implementation of the proposed Project would affect income generated from the production of agricultural goods on lands utilized for the pipeline right-of-way. Affected landowners would be fairly compensated for both temporary and long-term impacts resulting from restrictions to the planting of deep-rooted vegetation above the pipeline. PG&E would be required to provide financial compensation for temporary and permanent loss of agricultural uses through the California Code of Civil Procedure, section 1245.030(b), which requires compensation for property damage, including crop damage, resulting from pre-construction project studies, testing, and surveying. Section 1263.210(a) requires all property improvements, including agricultural crops and associated facilities and infrastructure, in project land rights acquisition compensation. Finally, Section 1263.250(a) requires compensation for crop damage/losses resulting from project construction; and requires scheduling project construction to avoid impacts to agricultural crops when possible. This impact would be the same for all agricultural areas throughout the length of the pipeline and would therefore not disproportionately affect the identified minority or low-income block groups. Therefore, the Project would be consistent with the CSLC Environmental Justice Policy.

5.5 RELATIONSHIP TO ALTERNATIVES

A No Project Alternative as well as twelve options have been proposed for the alignment in order to minimize or eliminate environmental impacts of the proposed Project. The twelve options, labeled A through L, have been analyzed in comparison to the portion of the proposed route that has been avoided as a result of the option. Descriptions of the options can be found in Section 3.0, Alternatives and Cumulative Projects, and are depicted in Figure 3-2A through Figure 3-2K.

5.5.1 No Project Alternative

Under the No Project Alternative, no natural gas pipeline would be constructed and there would be no potential to disproportionately affect high-minority or low-income populations. Therefore, this alternative would be consistent with the CSLC Environmental Justice Policy.

Option A

Option A would realign a portion of Line 406 to be located near County Road (CR) 16 and CR-15B, instead of near CR-17 and CR-16A. A portion of this option is located within Tract 114, Block Group 4, which has a minority population. The portion of this option within Block Group 4 crosses agricultural land. The remainder of this option, as well as the remainder of the Line 406 pipeline alignment is also located in an agricultural area with rural residential development. Therefore, this alternative would not disproportionately affect high-minority or low-income populations. Option A would be consistent with the CSLC Environmental Justice Policy.

Option B

Option B would realign a portion of Line 406 to be located near CR-16 and CR-89, instead of near CR-17. Since the area associated with this option is not located within a low-income or minority block group, Option B would be consistent with the CSLC Environmental Justice Policy.

Option C

Option C would realign a small portion of Line 406 in order to avoid bisecting three agricultural fields. The area traversed by Option C is not located in a minority or low-income block group. Option C would therefore be consistent with the CSLC Environmental Justice Policy.

Option D

Option D would realign a portion of Line 406 in order to avoid bisecting 10 agricultural fields. The area traversed by Option D is not included in a minority or low-income block group. Option D would be consistent with the CSLC Environmental Justice Policy.

Option E

Option E would realign a portion of Line 406 in order to avoid bisecting 10 agricultural fields. The area traversed by Option E is not included in a minority or low-income block group. Option E would be consistent with the CSLC Environmental Justice Policy.

Option F

Option F would realign a portion of Line 407 West to bisect an agricultural field in order to avoid difficult trenching through hilly terrain. The realignment would increase the short and long-term effects to a single row-crop field. The area traversed by Option F is not located in a minority or low-income block group. Option F would be consistent with the CSLC Environmental Justice Policy.

Option G

Option G would realign a portion of Line 407 West in order to avoid bisecting one agricultural field. Both the proposed project and the area traversed by Option G are located within Tract 114, Block Group 4, which has a minority population. The remainder of the Line 407 West pipeline alignment is also located in an agricultural area with rural residential development. Option G would not disproportionately affect high-minority or low-income populations. This alternative option would be consistent with the CSLC Environmental Justice Policy.

Option H

Option H would increase disturbance to the Yolo Bypass. The area traversed by Option H is not located in a minority or low-income block group. Option H would be consistent with the CSLC Environmental Justice Policy.

Option I

Option I would realign a portion of Line 407 East to the north in order to maintain a minimum 1,500-foot distance from a proposed school site south of Base Line Road. The area traversed by Option I is not located in a minority or low-income block group. Option I would therefore be consistent with the CSLC Environmental Justice Policy.

Option J

Option J would realign a portion of Line 407 East to the north in order to maintain a minimum 1,500-foot distance from a proposed school site south of Base Line Road. The area traversed by Option J is not located in a minority or low-income block group. This alternative option would be consistent with the CSLC Environmental Justice Policy.

Option K

Option K would realign a portion of Line 407 East to the north in order to maintain a minimum 1,500-foot distance from a proposed school site south of Base Line Road. The area traversed by Option K is not located in a minority or low-income block group. This alternative option would be consistent with the CSLC Environmental Justice Policy.

Option L

Option L would extend the proposed HDD alignment for a portion of Line 407-E in order to increase safety for a proposed school site south of Base Line Road. The area traversed by Option L is not located in a minority or low-income block group. Option L would therefore be consistent with the CSLC Environmental Justice Policy.

5.6 CUMULATIVE PROJECTS POLICY ANALYSIS

None of the other projects within this Project's vicinity, as identified in Section 3.0, Alternatives and Cumulative Projects, identify potential cumulative affects related to environmental justice.

No projects within the cumulative study area are identified as located within Tract 114, Block Group 4, which has been identified as containing a significant minority population. Three projects are planned in Tract 209.02, Block Group 1, which has been identified as containing a significant low-income population. Approximately seven residences are located within 1,000 feet of the pipeline within this block group. The three projects include the Watt Avenue Widening, Placer Vineyards Specific Plan, and Walerga Road Widening. It is unlikely that cumulative affects from these projects would result because none of the seven residences are located within 1,000 feet of the proposed pipeline along Watt Avenue; the Placer Vineyards Specific Plan Area does not include the seven residences; and the portion of Walerga Road that is adjacent to the seven residences located within 1,000 feet of the proposed pipeline has already been widened to four lanes. Since the proposed Project would not disproportionately affect environmental justice areas of concern and those areas would not likely be affected by other projects in the area, the proposed Project would not create a policy inconsistency.

6.0 OTHER REQUIRED CEQA SECTIONS

6.1 INTRODUCTION TO ADDITIONAL CEQA REQUIREMENTS DISCUSSED IN THIS SECTION

This Section discusses broader questions posed by the CEQA Guidelines. These include significant effects that cannot be mitigated to less than significant levels, irreversible/irretrievable commitment of resources, the balance between short- and long-term uses of the environment, and growth-inducing impacts.

6.2 SIGNIFICANT ENVIRONMENTAL EFFECTS OF PROPOSED PROJECT THAT CANNOT BE AVOIDED AND CANNOT BE MITIGATED TO LESS THAN SIGNIFICANT

Effects on all environmental resources were evaluated to determine any impacts that would remain significant after mitigation. There are significant and unavoidable (Class I) impacts related to Air Quality, Hazards and Hazardous Materials, and Land Use and Planning.

The Class I impact related to air quality is due to the exceedance of FRAQMD's threshold for ROG during the construction of Line 407 East, the DFM, and Line 407 West. The Class I impact related to air quality is discussed in detail in Section 4.3 of this Draft EIR.

The Class I impacts related to Hazards and Hazardous Materials and Land Use and Planning are safety risks to nearby land uses. Natural gas could be released from a leak or rupture. If the natural gas reached a combustible mixture and an ignition source was present, a fire and/or explosion could occur, result in possible injuries and/or deaths. The Class I impacts related to safety risks are discussed in detail in Sections 4.7 and 4.9 of this Draft EIR.

6.3 SIGNIFICANT ENVIRONMENTAL EFFECTS OF PROPOSED PROJECT THAT WOULD BE IRREVERSIBLE IF THE PROPOSED PROJECT IS IMPLEMENTED

The CEQA Guidelines, sections 15126.2(c) and 15127, require that an EIR consider significant irreversible environmental changes which would be involved in the proposed actions should they be implemented. An impact would fall into this category if:

- The project would involve a large commitment of nonrenewable resources during the project;

- The primary and secondary impacts of the project would generally commit future generations to similar uses (e.g., a highway provides access to a previously remote area); or

- The project would involve uses in which irreversible damage could result from any potential environmental accidents associated with the project.

Determination of whether the proposed Project would result in significant irreversible effects requires a determination of whether key resources would be degraded or destroyed with little possibility of restoring them.

The proposed Project would temporarily consume fossil fuel resources during the 10-month construction period, resulting in a commitment of nonrenewable resources. Construction of the proposed Project is expected to require consumption of 675 gallons of gas or diesel fuel per day or 81,000 gallons per year.

The Project would facilitate more efficient movement of natural gas in north Sutter County, Yolo County, Sacramento County, and Placer County. As stated above, the short-term energy consumption necessary for the implementation of the proposed Project would result in long-term energy benefits including a more efficient distribution system that expends less energy than the current distribution system. While the Project would facilitate the delivery of non-renewable resources, these resources would be exploited and expended now and in the near future regardless of the proposed Project as the production of natural gas that would be distributed by the Project has been, or would be, approved by permitting agencies. The operation of the proposed Project would be consistent with Federal and State policies encouraging competitive natural gas transportation services. For these reasons, the limited irreversible and irretrievable resource commitments described above are acceptable.

6.4 GROWTH-INDUCING IMPACTS OF THE PROPOSED PROJECT

The CEQA Guidelines require the consideration and discussion of growth-inducing impacts of a proposed project in an EIR. As specified in section 15126.2(d) of the CEQA Guidelines, an EIR would:

> Discuss the ways in which the proposed Project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth (a

> major expansion if a wastewater treatment plant might, for example, allow for more construction in service areas). Increases in the population may tax existing community service facilities, requiring construction of new facilities that could cause significant environmental effects. Also discuss the characteristics of some projects which may encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively. It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment.

The following six criteria are used as a guide in evaluating the growth-inducing potential of the proposed Project:

1. Would the Project foster growth or remove obstacles to economic or population growth?
2. Would the Project provide new employment?
3. Would the Project provide new access to undeveloped or under developed areas?
4. Would the Project extend public services to a previously unserved area?
5. Would the Project tax existing community services?
6. Would the Project cause development elsewhere?

6.4.1 Economic or Population Growth

As part of their 10-year investment plan, PG&E estimated demand for natural gas consumption and the amount of gas that would be distributed through the new gas pipelines. The base data used to support demand estimates was obtained from the Sacramento Area Council of Governments (SACOG), as well as from local newspaper reports and business trade reports. PG&E currently serves 675,000 customers in the Sacramento Valley Local Gas Transmission System (CSLC 2008). PG&E reports average daily gas throughput of 416 million cubic feet (MMcf), 464 MMcf, and 561 MMcf for the years 2009, 2012, and 2020, respectively. From 2009 until 2020 gas throughput in the proposed Project gas lines would increase an average of about 3.1 percent, and average annual residential gas consumption would increase slightly less, at 2.9 percent per year. In addition, the new lines would also need to supply gas to small commercial entities that are assumed by PG&E to grow at constant rate of 2,167 MMcf per day, per year. Based on PG&E's residential demand estimates, these changes in average daily throughput would accommodate all of the anticipated residential growth, and all anticipated growth from small commercial entities as projected by SACOG. The changes in average daily throughout do not provide excess supply of gas that could be considered growth inducing. The proposed Project would not foster growth or remove obstacles to population or economic growth.

6.4.2 New Employment

The proposed Project would require temporary construction workers to complete activities such as trenching, pipe laying, backfilling of trenches, and horizontal directional drilling. The proposed Project would require 90 to 130 temporary construction workers to accomplish these tasks over a 10-month period. However, no new, permanent employment would be created, and the jobs to housing balance would not be altered as discussed in Section 4.12, Population and Housing/Public Services/Utilities and Service Systems.

6.4.3 New Access

The proposed Project would not result in new access to previously undeveloped or under developed areas. The proposed Project would not require construction of new permanent roads; only existing roads and temporary roads would be used to access areas where pipeline construction and installation are needed. Any temporary access roads would be re-graded and restored to their natural condition.

6.4.4 Extend Public Services

The proposed Project would directly extend natural gas services to an area not previously served. PG&E currently has 675,000 residential customers in the Sacramento Valley Local Transmission System and serves these customers with existing gas lines. The Project would accommodate the SACOG growth projections and as a result would not induce growth.

6.4.5 Tax Existing Community Services

The proposed Project would not result in an increase in population beyond that which has already been anticipated in General Plans or Specific Plans in the affected counties. During construction of the Project, existing police and fire department personnel would respond to any Project-related emergencies. PG&E

would maintain routes for emergency service vehicles per their Traffic Management Plans (TMP). Therefore, there would be no impacts to existing community services.

6.4.6 Development

The customers that could be served by the proposed pipeline would not be solely dependent on the proposed Project for natural gas. Projected new residential demand that would occur as a result of implementation of the Placer Vineyards and Sutter Pointe Specific Plans have already been anticipated in the assumptions used by PG&E to design the Project. As a result, the addition or lack of natural gas associated with the proposed Project would not likely affect development in the region.

6.5 SUMMARY

The proposed Project would result in an irreversible impact in that construction related activities would consume 675 gallons of gas or diesel fuel per day. The proposed Project would not remove obstacles to economic or population growth. PG&E's planned increases in natural gas in Lines 406 and 407 would accommodate demand for anticipated residential and small commercial entity gas consumption. Average annual gas throughput and residential and small commercial demand for gas would grow at an annual average of about 3 percent.

The proposed Project would not result in additional, permanent employment. Existing PG&E employees would be responsible for operation and maintenance of Lines 406 and 407. During the construction phase of the Project there would be 90 to 130 temporary employees working on the pipeline, and this phase would last about 10 months.

The proposed Project would not result in new access since no permanent roads would be constructed. Any temporary access roads built during the construction phase of the Project would be re-graded and restored to their natural condition.

Nor would the proposed Project extend natural gas service to previously unserved areas. The Sacramento Valley Local Transmission System already serves 675,000 customers in the affected counties.

The proposed Project would not tax community services. In the unlikely event of a Project-related emergency, local fire and police departments would respond. PG&E would ensure through the Project TMP that access for emergency vehicles is not prevented by Project-related activities.

The proposed Project would accommodate other development in the region. As previously stated, the growth in natural gas throughput corresponds with estimated growth in residential demand, and must meet any increases in demand for natural gas from small commercial entities.

7.0 MITIGATION MONITORING PROGRAM

As the Lead Agency under the California Environmental Quality Act (CEQA), the California State Lands Commission (CSLC) is required to adopt a program for reporting or monitoring regarding the implementation of mitigation measures for this Project, if it is approved, to ensure that the adopted mitigation measures are implemented as defined in this EIR. This Lead Agency responsibility originates in Public Resources Code section 21081.6(a) (Findings), and the CEQA Guidelines sections 15091(d) (Findings) and 15097 (Mitigation Monitoring or Reporting).

7.1 MONITORING AUTHORITY

The purpose of a Mitigation Monitoring Program (MMP) is to ensure that measures adopted to mitigate or avoid significant impacts are implemented. A MMP can be a working guide to facilitate not only the implementation of mitigation measures by the Project proponent, but also the monitoring, compliance and reporting activities of the CSLC and any monitors it may designate.

The CSLC may delegate duties and responsibilities for monitoring to other environmental monitors or consultants as deemed necessary, and some monitoring responsibilities may be assumed by responsible agencies, such as affected jurisdictions and cities, and the California Department of Fish and Game (CDFG). The number of construction monitors assigned to the Project will depend on the number of concurrent construction activities and their locations. The CSLC or its designee(s), however, will ensure that each person delegated any duties or responsibilities is qualified to monitor compliance.

Any mitigation measure study or plan that requires the approval of the CSLC must allow at least 60 days for adequate review time. When a mitigation measure requires that a mitigation program be developed during the design phase of the Project, PG&E must submit the final program to CSLC for review and approval for at least 60 days before construction begins. Other agencies and jurisdictions may require additional review time. It is the responsibility of the environmental monitor assigned to each spread to ensure that appropriate agency reviews and approvals are obtained.

The CSLC or its designee will also ensure that any deviation from the procedures identified under the monitoring program is approved by the CSLC. Any deviation and its correction shall be reported immediately to the CSLC or its designee by the environmental monitor assigned to the construction spread.

7.2 ENFORCEMENT RESPONSIBILITY

The CSLC is responsible for enforcing the procedures adopted for monitoring through the environmental monitor assigned to each construction spread. Any assigned environmental monitor shall note problems with monitoring, notify appropriate agencies or individuals about any problems, and report the problems to the CSLC or its designee.

7.3 MITIGATION COMPLIANCE RESPONSIBILITY

PG&E is responsible for successfully implementing all the Applicant Proposed Measures (APMs) and mitigation measures (MMs) in the MMP, and is responsible for assuring that these requirements are met by all of its construction contractors and field personnel. Standards for successful mitigation also are implicit in many mitigation measures that include such requirements as obtaining permits or avoiding a specific impact entirely. Other mitigation measures include detailed success criteria. Additional mitigation success thresholds will be established by applicable agencies with jurisdiction through the permit process and through the review and approval of specific plans for the implementation of mitigation measures.

7.4 GENERAL MONITORING PROCEDURES

Environmental Monitors. Many of the monitoring procedures will be conducted during the construction phase of the Project. The CSLC and the environmental monitor(s) are responsible for integrating the mitigation monitoring procedures into the construction process in coordination with PG&E. To oversee the monitoring procedures and to ensure success, the environmental monitor assigned to each construction spread must be on site during that portion of construction that has the potential to create a significant environmental impact or other impact for which mitigation is required. The environmental monitor is responsible for ensuring that all procedures specified in the monitoring program are followed.

Construction Personnel. A key feature contributing to the success of mitigation monitoring will be obtaining the full cooperation of construction personnel and supervisors. Many of the mitigation measures require action on the part of the construction supervisors or crews for successful implementation. To ensure success, the following actions, detailed in specific mitigation measures, will be taken:

- Procedures to be followed by construction companies hired to do the work will be written into contracts between PG&E and any construction contractors.

Procedures to be followed by construction crews will be written into a separate document that all construction personnel will be asked to sign, denoting agreement;

- One or more pre-construction meetings will be held to inform all and train construction personnel about the requirements of the monitoring program; and
- A written summary of mitigation monitoring procedures will be provided to construction supervisors for all mitigation measures requiring their attention.

General Reporting Procedures. Site visits and specified monitoring procedures performed by other individuals will be reported to the environmental monitor assigned to the relevant construction spread. A monitoring record form will be submitted to the environmental monitor by the individual conducting the visit or procedure so that details of the visit can be recorded and progress tracked by the environmental monitor. A checklist will be developed and maintained by the environmental monitor to track all procedures required for each mitigation measure and to ensure that the timing specified for the procedures is adhered to. The environmental monitor will note any problems that may occur and take appropriate action to rectify the problems.

Public Access to Records. The public is allowed access to records and reports used to track the monitoring program. Monitoring records and reports will be made available for public inspection by the CSLC or its designee on request.

7.5 MITIGATION MONITORING TABLE

The following present the mitigation monitoring tables for each environmental discipline. Each table lists the following information, by column:

- Impact (impact number, title, and impact class);
- Mitigation Measure (Includes APM and MM with summary text of the measure);
- Location (where the impact occurs and the mitigation measure should be applied);
- Monitoring/reporting action (the action to be taken by the monitor or Lead Agency);
- Effectiveness criteria (how the agency can know if the measure is effective);
- Responsible agency; and
- Timing (before, during, or after construction; during operation, etc.).

Table 7-1: Mitigation Monitoring Program - Aesthetic/Visual Resources

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
AES-1: Degrade the existing visual character or quality of the site and its surroundings	**AES-1:** Replanting of screening vegetation	Entire alignment	Compliance monitoring	Recreates the visual quality provided by the removed vegetation	CSLC	After construction
AES-2: Create new source of light or glare	**AES-2:** Light shielding and positioning away from residences	HDD locations	Verification of light shielding and positioning	Reduces light trespass onto nearby residences	CSLC	During construction

Table 7-2: Mitigation Monitoring Program - Air Quality

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
Applicant Proposed Measures	**APM AQ-1:** Compile comprehensive inventory list of heavy-duty off-road equipment	Entire alignment	Review construction equipment inventory	Exhaust emissions are minimized	CSLC FRAQMD YSAWMD PCAPCD SMAQMD	Before construction
	APM AQ-2: Ensure that construction equipment exhaust emissions will not exceed Visible Emission limitations	Entire alignment	Equipment inspection	Exhaust emissions are minimized	CSLC FRAQMD YSAWMD PCAPCD SMAQMD	Before and during construction
	APM AQ-3: Prepare and implement a fugitive dust mitigation plan	Entire alignment	Review and verification of plan	Fugitive dust is minimized	CSLC FRAQMD YSAWMD PCAPCD SMAQMD	Before construction
	APM AQ-4: Ensure that all construction equipment is properly tuned and maintained	Entire alignment	Verification of maintenance	Exhaust emissions are minimized	CSLC FRAQMD YSAWMD PCAPCD SMAQMD	During construction
	APM AQ-5: Minimize equipment and vehicle idling time to five minutes	Entire alignment	Observation of idling time	Exhaust emissions are minimized	CSLC	During construction
	APM AQ-6: Prevent dust impacts off-site	Entire alignment	Observation of water truck operation	Fugitive dust is minimized	CSLC	During construction

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
	APM AQ-7: Utilize existing power sources or clean fuel generators	Entire alignment	Verification of power sources	Emissions are minimized	CSLC FRAQMD YSAWMD PCAPCD SMAQMD	During construction
	APM AQ-8: Develop traffic plan to minimize traffic flow interference	Entire alignment	Review and verification of plan	Exhaust emissions are minimized	CSLC County Agencies	Before and during construction
	APM AQ-9: Not allow open burning of removed vegetation	Entire alignment	Observation of vegetation removal	Reduces air pollution	CSLC	During construction
	APM AQ-10: Portable engines and portable engine-driven equipment units	Entire alignment	Verification of compliance	Ensures compliance with air quality standards	CSLC FRAQMD YSAWMD PCAPCD SMAQMD	Before and during construction
	APM AQ-11: Limit operation on “spare the air” days within each County	Entire alignment	Observation of limited operation	Emissions are reduced on “Spare the Air” days	CSLC FRAQMD YSAWMD PCAPCD SMAQMD	During construction

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
AQ-1: Construction or operational emissions exceeding regional thresholds	**AQ-1a:** Fugitive PM_{10} Control	Entire alignment	Observation of reduced speed on unpaved roads and application of soil stabilizers	Reduces fugitive dust emissions from Project construction	CSLC FRAQMD YSAWMD PCAPCD SMAQMD	During construction
	AQ-1b: NO_x Mitigation Menu	Entire alignment	Verify implementation of NO_x reducing measures	Reducing NO_x emissions	CSLC FRAQMD YSAWMD PCAPCD SMAQMD	Prior and during construction
AQ-2: Construction or operational emissions exceeding State or Federal standards	**AQ-1a:** Fugitive PM_{10} Control	Entire alignment	Observation of reduced speed on unpaved roads and application of soil stabilizers	Reduces fugitive dust emissions from Project construction	CSLC FRAQMD YSAWMD PCAPCD SMAQMD	During construction
	AQ-1b: NO_x Mitigation Menu	Entire alignment	Verify implementation of NO_x reducing measures	Reducing NO_x emissions	CSLC FRAQMD YSAWMD PCAPCD SMAQMD	Prior and during construction
AQ-3: Increase in Greenhouse Gas Emissions	**AQ-3:** GHG Emission Offset Program	Entire alignment	Verification of Carbon Offsets Program purchase	Offset of GHG emissions	CSLC FRAQMD YSAWMD PCAPCD SMAQMD	Prior to Construction

Table 7-3: Mitigation Monitoring Program - Biological Resources

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
Applicant Proposed Measures	**APM BIO-1:** Worker Training	Entire alignment	Verification of training attendance	Improves awareness and compliance with mitigation measures	CSLC	Before and during construction
	APM BIO-2: Educational Brochure	Entire alignment	Verification of brochure distribution	Improves awareness and compliance with mitigation measures	CSLC	Before and during construction
	APM BIO-3: Exclusion Zone Fencing	Entire alignment	Verification of exclusion zone fencing	Avoids inadvertent intrusion into sensitive resources	CSLC CDFG USFWS USACE RWQCB	During construction
	APM BIO-4: Vegetation Removal	Entire alignment	Compliance monitoring	Ensures vegetation is only removed within the approved work area	CSLC	During construction
	APM BIO-5: Work Area	Entire alignment	Verification of work area	Protects sensitive areas from heavy equipment, vehicles, and construction work	CSLC	During construction
	APM BIO-6: Construction Monitoring	Entire alignment	Verification of monitoring and pre-activity surveys	Avoids disturbance of special-status species and habitats	CSLC CDFG USFWS USACE	Before and during construction

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
	APM BIO-7: Erosion and Dust Control	Entire alignment	Verify application of control BMPs	Minimizes potential for impacts to sensitive resources	CSLC USACE RWQCB	During construction
	APM BIO-8: Workday Schedule	Entire alignment	Verification of schedule	Minimizes disturbance from construction	CSLC	During construction
	APM BIO-9: Vehicle Inspection	Entire alignment	Verify that vehicles and equipment are inspected for wildlife	Avoids injury or death of wildlife	CSLC	During construction
	APM BIO-10: Speed Limit	Entire alignment	Verify enforcement of speed limits	Protects sensitive habitat	CSLC	During construction
	APM BIO-11: Trench Ramping	Entire alignment	Verification of trench ramping	Avoids injury or death of wildlife	CSLC CDFG USFWS	During construction
	APM BIO-12: Sensitive Habitat Monitoring and Procedures if Listed Species are Found	Entire alignment	Observation of sensitive habitat monitoring	Avoids unnecessary disturbance to sensitive species or habitat	CSLC CDFG USFWS	During construction
	APM BIO-13: Spill Prevention/Containment and Refueling Precautions	Entire alignment	Verify that precautions are implemented	Minimizes potential for spills that may impact sensitive species	CSLC CDFG USFWS USACE	Before and during construction
	APM BIO-14: Trash Cleanup	Entire alignment	Observation of trash cleanup	Avoids unnecessary disturbance to sensitive species or habitat	CSLC	During and after construction

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
	APM BIO-15: Prohibitions for Pets, Fire, Firearms	Entire alignment	Observation of prohibition	Avoids unnecessary disturbance to sensitive species or habitat	CSLC	During construction
	APM BIO-16: ROW Restoration	Entire alignment	Verification of restoration	Restores work areas to pre-existing contours and conditions	CSLC CDFG USACE USFWS	After construction
	APM BIO-17: ROW Restoration Plan	Entire alignment	Review and verification of plan; observation of restoration measures	Ensures post-construction revegetation, success criteria, and monitoring periods in natural areas	CSLC	After construction
	APM BIO-18: Seed Mix and Success Criteria	Entire alignment	Verify seed mix and success criteria	Restores wetlands and stream crossings	CSLC	After construction
	APM BIO-19: Erosion Control	Entire alignment	Observation of erosion control measures	Ensures that revegetation is successful	CSLC CDFG USACE RWQCB	After construction
	APM BIO-20: Water Crossings in Special-status Species Habitats	Entire alignment	Verification of water crossing schedule	Protects habitat for special-status aquatic species	CSLC USACE NMFS USFWS	During construction
	APM BIO-21: Wetland and Waterway Avoidance During Final Design	Entire alignment	Verification of avoidance measures	Avoids impacts to sensitive wetland habitats and waterways	CSLC USACE NMFS USFWS	Before construction

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
	APM BIO-22: Wetland Restoration and Monitoring Plan	Entire alignment	Review and verification of plan; observation of restoration and mitigation measures	Minimizes impacts to sensitive wetland habitats and waterways	CSLC CDFG USACE NMFS USFWS	Before construction
	APM BIO-23: HDD Fluid Release Contingency Plan	HDD locations	Review and verification of plan; observation of procedures	Minimizes personal injury, death, or property damage from accidental spills during construction	CSLC USACE RWQCB	Before construction
	APM BIO-24: Vernal Pool Invertebrate Mitigation	Entire alignment	Verification of mitigation measures, compliance monitoring	Minimizes effects to vernal pool invertebrate species	CSLC USFWS	During construction
	APM BIO-25: Giant Garter Snake Habitat Buffer	Entire alignment	Verification of buffer	Avoids injury or death of giant garter snake	CSLC CDFG USFWS	During construction
	APM BIO-26: Construction Window in Giant Garter Snake Habitat	Entire alignment	Verification of construction window	Avoids injury or death of giant garter snake	CSLC CDFG USFWS	Before and during construction
	APM BIO-27: Giant Garter Snake Monitoring	Entire alignment	Verification of monitoring	Avoids injury or death of giant garter snake	CSLC CDFG USFWS	During construction
	APM BIO-28: Dewatering Giant Garter Snake Habitat	Entire alignment	Observation of dewatering	Avoids injury or death of giant garter snake	CSLC CDFG USFWS	Before and during construction

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
	APM BIO-29: Bird Nest Surveys and Monitoring	Entire alignment	Verification of surveys and observation of monitoring	Avoids disturbance of nesting birds and raptors	CSLC CDFG	Before and during construction
	APM BIO-30: Nesting Birds	Entire alignment	Verification of buffer zone and avoidance	Avoids disturbance of nesting birds and raptors	CSLC CDFG	During construction
	APM BIO-31: Burrowing Owl Surveys	Entire alignment	Verification of pre-construction surveys	Avoids disturbance of burrowing owls	CSLC CDFG	Before and during construction
	APM BIO-32: Burrow Avoidance	Entire alignment	Verification of buffer zone and avoidance	Avoids disturbance of burrowing owls	CSLC CDFG	Before and during construction
	APM BIO-33: Burrow Relocation	Entire alignment	Observation of burrow relocation	Minimizes disturbance of burrowing owls	CSLC CDFG	Before and during construction
	APM BIO-34: Burrowing Owl Monitoring Plan	Entire alignment	Review and verification of plan	Protection of burrowing owls from Project disturbance	CSLC CDFG	Before and during construction
	APM BIO-35: Species-specific and Habitat-specific Compensation	Entire alignment	Verification of compensatory mitigation	Minimizes disturbance to vernal pools, wetlands, giant garter snake, and other special-status species	CSLC CDFG USFWS USACE	Before and during construction
BIO-1: Wetlands	**BIO-1a:** Wetland avoidance and restoration	Entire alignment	Verification of avoidance and observation of mitigation	Ensures that impacts to wetlands are minimized to the greatest extent feasible	CSLC CDFG USACE RWQCB	During construction

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
	BIO-1b: Trench backfill and topographic restoration	Entire alignment	Verification of mitigation implementation	Ensures that permanent hydrologic alternation to wetlands is minimized	CSLC CDFG USACE RWQCB County Agencies	Before, during and after construction
	BIO-1c: Riparian avoidance and restoration	Entire alignment	Verification of riparian avoidance and restoration	Ensures impact to riparian habitat is avoided, minimized or restored	CSLC CDFG USACE	Before, during and after construction
BIO-2: Reduce or alter vegetation	**BIO-2a:** Tree avoidance and replacement	Entire alignment	Review of Tree Replacement Plan, verification of avoidance and replacement	Ensures identification, protection, and replacement of native trees within the Project site	CSLC CDFG County Agencies	Before, during and after construction
	BIO-2b: Avoidance of valley oak woodland	State Route 113 vicinity	Verification and observation of trenchless excavation	Ensures that existing mature valley oak woodland is not impacted by the Project	CSLC CDFG	Before construction
BIO-3: Invasive species or soil pests	**BIO-3:** Prepare and implement an invasive species control program	Entire alignment	Verify implementation of program measures	Minimizes the introduction of new invasive weed species, soil pathogens, or aquatic invertebrates	CSLC CDFA, Control and Eradication Division	Before and during construction

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
BIO-4: Habitat removal or loss of special status species	**BIO-4a:** Protect special status wildlife	Entire alignment	Verification of avoidance and observation of mitigation	Ensures that habitat removal or loss of special status species is minimized to the greatest extent feasible	CSLC USFWS CDFG	Before and during construction
	BIO-4b: Mitigation for potential impacts to Natomas Basin Conservancy mitigation lands	Natomas Basin Conservancy mitigation lands	Verification of mitigation measures	Reduces impacts to Natomas Basin Conservancy mitigation lands	CSLC	Before and during construction
	BIO-4c: Mitigation for potential impacts to Sacramento River Ranch Conservation Bank mitigation lands	Sacramento River Ranch Conservation Bank mitigation lands	Verification of mitigation measures	Reduces impacts to Sacramento River Ranch Conservation Bank mitigation lands	CSLC	Before and during construction
	BIO-4d: Protect special-status bird species	Entire alignment	Verification of construction timing, buffer implementation and/or mitigation consultation	Reduces potential impacts to special-status bird species	CSLC USFWS CDFG	Before and during construction

Table 7-4: Mitigation Monitoring Program - Cultural Resources

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
Applicant Proposed Measures	**APM CR-1:** Evaluate unavoidable unevaluated resources	Entire alignment	Verify evaluation of unavoidable unevaluated resources	Identifies and protects unevaluated resources in the Project site	CSLC NCIC/ CHRIS	During construction
	APM CR-2: Protect significant/eligible resources	Entire alignment	Compliance monitoring	Protects significant/eligible resources	CSLC NCIC/ CHRIS	During construction
	APM CR-3: Test areas sensitive for buried archaeological remains at reported location of Eagle Hotel	Eagle Hotel	Observation of testing at Eagle Hotel	Reduces potential for damage to unknown buried archaeological remains	CSLC NCIC/ CHRIS	During construction
	APM CR-4: Consult with the local Native American community	Entire alignment	Verify consultation	Ensures appropriate treatment of archaeological materials or human remains	CSLC	Before and during construction
	APM CR-5: Provide environmental training	Entire alignment	Verification of training attendance	Improves awareness and compliance with procedures	CSLC	Before construction
	APM PALEO-1: Paleontologist will provide input for environmental training	Entire alignment	Verification of involvement in training	Improves awareness of paleontologic resource issues	CSLC	Before construction
	APM PALEO-2: Provide environmental training	Entire alignment	Verification of training attendance	Improves awareness of compliance measures pertaining to paleontological resources	CSLC	Before construction

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
	APM PALEO-3: Monitoring by a qualified paleontologist for areas with high sensitivity	Entire alignment	Observation of monitoring	Reduces potential for damage to unknown buried paleontological resources	CSLC	During construction
	APM PALEO-4: Monitoring by a qualified paleontologist for area east of Yolo	Line 407 West Project area east of Yolo	Observation of monitoring	Reduces potential for damage to unknown buried paleontological resources	CSLC	During construction
	APM PALEO-5: Stop work within 25 feet of any paleontological resources discovered during Project activities if qualified monitor is not present	Entire alignment	Observe construction activities	Reduces potential for damage to unknown buried paleontological resources	CSLC	During construction
PALEO-1: Fossils	**PALEO-1:** Proper curation of fossil collection	Entire alignment	Verification or proper curation	Enhances subsequent evaluation and curation by the chosen repository	CSLC	During and after construction
PALEO-2: Scientific or educational value	**PALEO-2:** Delivery of fossil collection to appropriate location	Entire alignment	Verification of delivery	Ensures that the fossil collection would be permanently incorporated into the larger collection of an appropriate curatorial facility	CSLC	During and after construction

Table 7-5: Mitigation Monitoring Program - Geology and Soils

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
GEO-1: Known earth-quake faults /ground motion	**GEO-1:** Site specific seismic field investigation	Entire alignment	Review of site specific field investigation and verification of implementation	Minimizes hazards due possible seismic displacement along fault crossings	CSLC	Before and during construction

Table 7-6: Mitigation Monitoring Program - Hazards and Hazardous Materials

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
Applicant Proposed Measures	**APM HAZ-1:** Environmental training program	Entire alignment	Verification of training attendance	Improves awareness and compliance with mitigation measures	CSLC	Before and during construction
	APM HAZ-2: Hazardous substance control and emergency response plan	Entire alignment	Review and verify plan and observe construction activities for compliance	Minimizes personal injury, death, or property damage from accidental spills during construction	CSLC County CUPAs	Before and during construction
	APM HAZ-3: Use oil-absorbent material, tarps, and storage drums to contain and control any minor releases	Entire alignment	Verify supplies and equipment	Minimizes personal injury, death, or property damage from accidental spills during construction	CSLC	During construction

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
	APM HAZ-4: Conduct soil sampling and potholing along the Project route	Entire alignment	Observe sampling and potholing for compliance	Minimizes potential for release of pre-existing contamination	CSLC County CUPAs	Before construction
	APM HAZ-5: Laboratory analysis of any suspected contaminated groundwater sampling	Entire alignment	Observe sampling for compliance	Minimizes potential for release of pre-existing contamination	CSLC County CUPAs	During construction
	APM HAZ-6: Prepare Construction Fire Risk Management Plan	Entire alignment	Observe construction activities for compliance	Minimizes personal injury, death, or property damage from fire during construction	CSLC	During construction
	APM HAZ-7: Properties with a history of agricultural use	Entire alignment	Observe construction activities for compliance	Minimizes potential for release of pre-existing contamination	CSLC	During construction
	APM HAZ-8: Operation Fire Risk Management Plan	Entire alignment	Observe operation activities for compliance	Minimizes personal injury, death, or property damage from fire during operation	CSLC	During operation
HAZ-1: Emergency plans/wildland fires	**HAZ-1:** Minimize risk of fire	Entire alignment	Observe construction and operation activities for compliance	Minimize damage from fire	CSLC County Agencies	During construction and operation

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
HAZ-2: System safety and risk of serious injuries and fatalities due to project upset	**HAZ-2a:** Corrosion mitigation	Entire alignment	Observe construction and operation activities for compliance	Minimize leaks or ruptures caused by corrosion	CSLC	During construction and operation
	HAZ-2b: Installation of automatic shutdown valves	Power Line Road MLV Station No. 752+00 (which includes the Riego Road Regulating Station), Baseline Road/Brewer Road MLV Station No. 1107+00, and Baseline Road Pressure Regulating Station No. 1361+00	Confirm installation of automatic shutdown valves	Ensures enhanced public safety through ability to shutdown pipeline during emergencies	CSLC	During construction and operation

Table 7-7: Mitigation Monitoring Program - Hydrology and Water Quality

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
Applicant Proposed Measures	**APM HWQ-1:** Implement BMPs from the Water Quality Construction Best Management Practices Manual	Entire alignment	Verification of BMPs	Prevents Project-related erosion and sedimentation	CSLC RWQCB	During construction
	APM HWQ-2: Implement a Hazardous Substances Control and Emergency Response Plan	Entire alignment	Review and verification of plan	Minimizes personal injury, death, or property damage from hazardous material spills	CSLC RWQCB	During construction
	APM HWQ-3: Perform open-cut crossings of water bodies using a dry-crossing method	Entire alignment	Observe operation activities for compliance	Minimizes effects of construction activities on the waterbody	CSLC RWQCB	During construction
	APM HWQ-4: Cross larger and/or more sensitive waterways with HDD or bores	HDD locations	Verify HDD locations	Minimizes effects to sensitive waterways	CSLC RWQCB	During construction
	APM HWQ-5: Prepare an HDD Fluid Release Contingency Plan	HDD locations	Review and verification of plan	Minimize effects to waterways in the event of a frac-out	CSLC RWQCB	During construction
HWQ-1: Federal or state water quality standards:	**HWQ-1:** Response to unanticipated release of drilling fluids	Entire alignment	Adherence to drilling fluid release plan	Prevents and responds to unintended frac-outs	CSLC USACE CDFG County Agencies	During construction

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
HWQ-2: Ground-water for private or municipal pur-poses	**HWQ-2:** Verify well lo-cations	Entire alignment	Verify well loca-tion and testing	Monitors potential effects to groundwater wells	CSLC	Before and during construction
HWQ-3: 100-year floodplain	**HWQ-3:** Flood-proof pump houses within 100-year flood plain	Entire alignment	Verify houses are flood-proof	Reduce the risk of catastro-phic damage due to 100-year flood	CSLC County Agencies	During construction and operation

Table 7-8: Mitigation Monitoring Program - Land Use and Planning

Impact	Mitigation Measure	Location	Monitoring / Report-ing Action	Effectiveness Criteria	Responsible Agency	Timing
LU-1: Conflict with Adjacent Land Uses	**LU-1a:** Mitigation for impacts to the Natomas Basin Conservancy mitigation lands	Entire alignment	Verify that MM BIO-4b has been implemented	Reduces any impacts to mitigation lands	CSLC	During and after construction
	LU-1b: Mitigation for impacts to the Sacra-mento River Ranch Conservation Bank miti-gation lands	Entire alignment	Verify that MM BIO-4c has been implemented	Reduces any impacts to mitigation lands	CSLC	During and after construction
	LU-1c: WAPA license agreement	Entire alignment	Verify submittal of Project plans	Reduces any impacts to WAPA power line opera-tions	CSLC	Before construction

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
LU-2: Result in safety risk to nearby land uses	**LU-2a:** Implement MM HAZ-2a, Corrosion Mitigation.	Entire alignment	Verify that MM HAZ-2a has been implemented	Reduces incidences of leaks caused by corrosion.	CSLC	During and after construction
	LU-2b: Implement HAZ-2b, Installation of automatic shut-down valves.	Entire alignment	Verify that MM HAZ-2b has been implemented	Ensures enhanced public safety through ability to shutdown pipeline during emergencies.	CSLC	During construction and operation

Table 7-9: Mitigation Monitoring Program - Noise

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
Applicant Proposed Measures	**APM NOI-1:** Limit construction hours and apply noise control best management practices	Alignment in the vicinity of residences	Verify construction schedule; verify best management practices	Avoids nighttime noise where feasible; reduces noise from construction	CSLC	During construction
	APM NOI-2: Coordinate drilling activities	HDD areas	Verify coordination with residences	Provides advanced notice of nighttime noise	CSLC	During construction
NOI-1: Project construction	**NOI-1a:** Limited construction hours	Entire alignment	Verify construction schedule	Avoids nighttime noise where feasible	CSLC	During construction
	NOI-1b: Best management practices	Entire alignment	Verify best management practices	Provides maximum practical noise reduction	CSLC	During construction

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
	NOI-1c: Noise reduction plan	Entire alignment	Verify acoustical analysis and implementation	Minimizes nighttime construction noise	CSLC	During construction
NOI-2 Groundborne vibration or noise	**NOI-2a:** Distance from residences	Entire alignment	Verify distance	Reduces severity of groundborne vibration and noise near residences	CSLC	During construction
	NOI-2b: Heavy-loaded trucks	Entire alignment	Verify routes	Reduces severity of groundborne vibration and noise near residences	CSLC	During construction
	NOI-2c: Earth Moving Equipment / Distance from vibration-sensitive sites	Entire alignment	Verify distance	Reduces severity of groundborne vibration near sensitive sites	CSLC	During construction
	NOI-2d: Nighttime construction	Entire alignment	Verify construction schedule	Avoids nighttime groundborne vibration or where feasible	CSLC	During construction

Table 7-10: Mitigation Monitoring Program - Transportation and Traffic

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
Applicant Proposed Measures	**APM TRANS-1:** Travel lane capacity and traffic control	Entire alignment	Verify capacity and traffic control	Reduces effect of Project on local traffic	CSLC County Agencies	During construction
	APM TRANS-2: Work zone	Entire alignment	Verify work zone	Reduces effect of Project on local traffic	CSLC County Agencies	During construction

Impact	Mitigation Measure	Location	Monitoring / Reporting Action	Effectiveness Criteria	Responsible Agency	Timing
	APM TRANS-3: Permits and Transportation Management Plan (TMP)	Entire alignment	Review and verification of plan; verification of permits	Reduces effect of Project on local traffic	CSLC County Agencies	Before construction
	APM TRANS-4: Coordinate construction activities with local law enforcement and fire protection agencies	Entire alignment	Verify coordination and notification	Increases awareness of emergency service providers	CSLC County Agencies	Before and during construction
	APM TRANS-5: Consult with the Placer County Unified School District and Yuba-Sutter Transit	Entire alignment	Verify consultation	Reduces effect of Project on school and local bus transit	CSLC	Before construction
	APM TRANS-6: Notification of access restrictions	Entire alignment	Verify notice to residents	Reduces inconvenience to local residents	CSLC	Before construction
	APM TRANS-7: Notification of temporary parking	Entire alignment	Verify notice to residents	Reduces inconvenience to local residents	CSLC	During construction
	APM TRANS-8: Temporary pedestrian access	Entire alignment	Verify detours and safe areas	Reduces inconvenience to pedestrians	CSLC County Agencies	During construction

8.0 REPORT PREPARATION PERSONNEL

8.1 AGENCY REVIEWERS

The following California State Lands Commission staff were responsible for reviewing this EIR:

- Crystal Spurr, Project Manager;
- Eric Gillies, Staff Environmental Scientist; and
- Gail Newton, Division Chief.

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Hanover Environmental Services, Inc.		
Will Bono, President and CFO UC Davis Extension, Site Assessment and Remediation Certificate Program Health and Safety Training for Hazardous Waste Sites, 40 hour and 8 hour OSHA Health and Safety Training and Refresher Courses	Hazards and Hazardous Materials	8
Kamie Loeser, Senior Environmental Planner Master of Rural and Town Planning (MRTP), California State University Chico Bachelor's degree, Geography and Planning, California State University Chico	Hazards and Hazardous Materials	15
Luke Smith, Environmental Scientist Bachelor's degree, Agricultural Science, California State University, Chico	Hazards and Hazardous Materials	4

Personnel	Name of Section Worked on	Years Experience
Ninyo & Moore		
Greg Farrand, Principal Geologist, CEG, PG Master's degree, City Planning, San Diego State University Bachelor's degree, Geology, California State University, Northridge	Geology and Soils	30

8.3 EIR INFORMATION CONSULTATIONS

Brooks, Janie. Placer County Office of Emergency Services. Personal Communication. May 30, 2008. (Socioeconomics).

CSLC 2008. Personal Communication with Crystal Spurr from Christoffer Ellis of PG&E on April 16, 2008 (Other Required CEQA Sections).

Esparza, Lilia. Yolo County Planning and Public Works. Personal Communication: Telephone conversation with Erin Bibeau. September 4, 2008. (Transportation and Traffic).

Franks, Alvin, Ph.D. Personal Communication: Electronic mail conversation with Chelsea Ayala. September 2008. (Energy and Mineral Resources).

Melton, Ruby. City of Sacramento Fire Department. Personal Conversation: Telephone conversation with Janna Waligorski. May 30, 2008. (Socioeconomics).

Reeves, Kent. Yolo County Planning Department. Personal communication. Telephone conversation with Deborah Stout on December 12 2008.

Rose, Jim. Sr. Engineer Technician. Placer County. Personal Communication: Telephone conversation with Erin Bibeau. September 4, 2008. (Transportation and Traffic).

Sober, Breann. Placer County Planning Department. Personal communication. Telephone conversation with Deborah Stout on December 12 2008.

9.0 REFERENCES

1.0 - INTRODUCTION

Pacific Gas and Electric Company (PG&E). 2007. Line 407 and 407 Pipeline Project California State Lands Commission Application Preliminary Environmental Analysis. March 8.

2.0 - PROJECT DESCRIPTION

California State Lands Commission (CSLS). 2007. Draft EIR for the PG&E Line 108 Project. November.

Pacific Gas and Electric Company (PG&E). 2006. Pacific Gas & Electric Company Water Quality Construction Best Management Practices Manual.

Pacific Gas and Electric Company (PG&E). 2007a. Pacific Gas and Electric Company Line 406 and Line 407 Pipeline Project California State Lands Commission Application, Preliminary Environmental Analysis. March 8.

Pacific Gas and Electric Company (PG&E). 2007b. Pacific Gas & Electric Company L406/407. Pre-Construction Review. October.

Pacific Gas and Electric Company (PG&E). 2008. Pacific Gas & Electric Company Design Basis L 406/407 Pipeline Expansion Project. February 28.

3.0 - ALTERNATIVES AND CUMULATIVE PROJECTS

California Building Standards Commission (CSBS). 2001. California Building Code, 20 Title 24, Part 2, Volumes 1 and 2.

California Department of Water Resources (DWR). 2004. Sacramento Valley Groundwater Basin, South American Subbasin. California's Groundwater, Bulletin 118. Updated February 27.

Hart, E.W., and Bryant, W.A. 1997. Fault-Rupture Hazard Zones in California, Alquist-Priolo Earthquake Fault Zoning Act with Index to Earthquake Fault Zone Maps: California Department of Conservation, Division of Mines and Geology, Special Publication 42.

Regional Water Quality Control Board (RWQCB). 2006. 2006 Clean Water Act Section 303(d) List of Water Quality Limited Segments. Website:

http://www.waterboards.ca.gov/tmdl/303d_lists2006.html. Accessed December 2007.

4.0 - ENVIRONMENTAL IMPACT ANALYSIS

None.

4.1 - AESTHETIC/VISUAL RESOURCES

California State Parks. Sutter Buttes: Maidu's Spirit Mountain. Website: http://www.parks.ca.gov/?page_id=23786. Accessed May 21, 2008.

Placer County. 1994. Placer County General Plan. August 16.

Sacramento County. 1993. County of Sacramento General Plan. December 15.

Sutter County. 1996. Sutter County General Plan-Policy Document. November 25.

Yolo County. 2005. Yolo County General Plan Update-Background Report.

4.2 - AGRICULTURAL RESOURCES

California Department of Conservation, Division of Land Resource Protection, Farmland Mapping and Monitoring Program. 2006. California Farmland Conversion Report 2002-2004.

California Department of Conservation (DOC), Williamson Act Program - Reports and Statistics: Current and Historic Data About Williamson Act Status. Website: http://www.conservation.ca.gov/dlrp/lca/stats_reports/Pages/Index.aspx. Accessed April 21, 2008.

Environmental Protection Agency (EPA), 1996. Memorandum to the Field: Applicability of Exemptions under Section 404 (f) to Deep Ripping Activities in Wetlands.

Pacific Gas and Electric Company (PG&E) 2007. Pacific Gas and Electric Company Line 406 and Line 407 Pipeline Project Supplemental California State Lands Commission Filing, Preliminary Environmental Analysis. October 2007.

Pacific Gas and Electric Company (PG&E) 2004. Pacific Gas and Electric Company's Water Quality Construction Best Management Practices Manual.

Placer County. 1994. Placer County General Plan.

Placer County. 2007. 2006 Agricultural Crop Production Report for Placer County.

Sacramento County. 1993. Sacramento County General Plan. December 15.

Sacramento County. 2006. Sacramento County 2006 Crop & Livestock Report.

Sutter County. 1996. Sutter County General Plan.

Sutter County. 2006. Sutter County Crop, Livestock, and Annual Department.

Yolo County. 1983. Yolo County General Plan. July 17.

Yolo County. 2006. Yolo County Crop Report 2006. Website: http://www.yolocounty.org/org/AG/acr06/crcont.htm. Accessed April 21, 2008.

4.3 - AIR QUALITY

California Air Resources Board (CARB). 1998. Identification of Diesel Exhaust as a Toxic Air Contaminant. Available at: http://www.arb.ca.gov\regact\regup98.htm#diesltac

California Air Resources Board (CARB). 2001. Ozone Transport: 2001 Review. Staff Report. April 2001.

California Air Resources Board (CARB). 2007a. Ambient Air Quality Standards dated February 22, 2007. Website http://www.arb.ca.gov/research/aaqs/aaqs2.pdf. Accessed June 2007.

California Air Resources Board (CARB). 2007b. California Greenhouse Gas Inventory (millions of metric tonnes of CO2 equivalent) - By IPCC Category. August 22.

California Air Resources Board (CARB). 2008. Air Quality Data Statistics. Website: http://www.arb.ca.gov/adam/cgi-bin/db2www/adamtop4b.d2w/start. Accessed June 12, 2008.

California Air Resources Board (CARB). 2008b. The California Almanac of Emissions and Air Quality - 2008 Edition.

California Air Resources Board (CARB). 2008c. Sacramento Regional 8-Hour Ozone Attainment and Reasonable Further Progress Plan, Draft Report. September 10.

California Air Resources Board (CARB). 2008d. California Air Resources Board. Climate Change Proposed Scoping Plan: a framework for change. October 2008.

California Attorney General (AG) 2008. The California Environmental Quality Act: Addressing Global Warming Impacts at the Local Agency Level. Updated May 21, 2008.

California Department of Conservation, Division of Mines and Geology (DMG) 2000. A General Location Guide for Ultramafic Rocks in California - Areas More Likely to Contain Naturally Occurring Asbestos. August 2000.

California Energy Commission (CEC). 2006. Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004. Staff Final Report. CEC-600-2006-013-SF. December 2006.

City of Roseville. 2004. General Plan 2020.

Intergovernmental Panel on Climate Change (IPCC) 2007. Summary for Policymakers. In: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

Intergovernmental Panel on Climate Change (IPCC) 2007b. Parry, M.L., O.F. Canziani, J.P. Palutikof and Co-authors 2007: Technical Summary. Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 23-78.

PG&E 2007. Pacific Gas and Electric Company Line 406 and Line 407 Pipeline Project California State Lands Commission Application, Preliminary Environmental Analysis. March 8/

PG&E 2008. Pacific Gas and Electric Company, Darin Jones. "Re: L406/407 CSL Data Request - (Follow up)." E-Mail to Steve Willoughby. October 7, 2008.

Placer County. 1994. Placer General Plan. August 1994.

Sacramento County. 1993. 1993 County of Sacramento General Plan. December 1993.

State of California, Environmental Protection Agency, Climate Action Team (CAT). March 2006. Climate Action Team Report to Governor Schwarzenegger and the California Legislature. Website: www.climatechange.ca.gov/climate_action_team/reports/index.html. Accessed June 13, 2008.

Sutter County 1996. Sutter County General Plan. November 1996.

U.S. Environmental Protection Agency. (EPA). 2008. National Ambient Air Quality Standards (NAAQS). Website http://www.epa.gov/air/criteria.html. Accessed August 5, 2008.

Western Regional Climate Center (WRCC). 2008. Western U.S. Climate Historical Summaries. Knights Landing, California. Website: http://www.wrcc.dri.edu/Climsum.html. Accessed June 11, 2008.

Yolo County. 1983. Yolo County General Plan. July 1983.

4.4 - BIOLOGICAL RESOURCES

Bossard, Carla C., John M. Randall, and Marc C. Hoshovsky (eds). 2000. Invasive Plants of California's Wildlands. University of California Press.

California Department of Fish and Game (CDFG). 1988a. California's Wildlife, Volume I: Amphibians and Reptiles. State of California Resources Agency. Sacramento, California.

California Department of Fish and Game (CDFG). 1988b. California's Wildlife, Volume II: Birds. State of California Resources Agency. Sacramento, California.

California Department of Fish and Game (CDFG). 1988c. California's Wildlife, Volume III: Mammals. State of California Resources Agency. Sacramento, California.

California Department of Fish and Game (CDFG). 1996. Steelhead Restoration and Management Plan for California. February 1996. Website: http://www.dfg.ca.gov/fish/Resources/SteelHead/index.asp. Accessed August 20, 2008.

California Department of Fish and Game (CDFG). California Interagency Wildlife Task Group. 2005. CWHR Version 8.1 personal computer program. Sacramento, California.

California Department of Fish and Game (CDFG). 2008a. Special Animals List. The Resources Agency of California, Department of Fish and Game, Natural Heritage Division, Natural Diversity Data Base. Sacramento, California.

California Department of Fish and Game (CDFG). 2008b. Endangered and Threatened Animals List. The Resources Agency of California, Department of Fish and Game, Natural Heritage Division, Natural Diversity Data Base. Sacramento, California.

California Department of Fish and Game (CDFG). 2008c. Special Vascular Plants, Bryophytes, and Lichens List. The Resources Agency of California, Department of Fish and Game, Natural Heritage Division, Natural Diversity Data Base. Sacramento, California.

California Natural Diversity Data Base (CNDDB). 2008. Biogeographic Data Branch. Department of Fish and Game. Version 3.1.0; June 1.

California Native Plant Society (CNPS). 2008. Inventory of Rare and Endangered Plants (online edition, 14:20b). California Native Plant Society. Sacramento, California. Website: http://www.cnps.org/inventory.

CH2MHILL. 2007. Rare Plant Survey, PG&E Line 406 Project in Yolo County, California. June 27, 2007.

CH2MHILL. 2008. PG&E Line 406 Pipeline Project Wetland Delineation Report. Prepared for Pacific Gas and Electric. May 2008.

City of Sacramento, Sutter County, Natomas Basin Conservancy. 2003. Final Natomas Basin Conservation Habitat Conservation Plan. Prepared in association with Reclamation District No. 1000 and Natomas Central Mutual Water Company. Prepared for U.S. Fish and Wildlife Service and California Dept. of Fish and Game.

County of Sacramento. 1993. County of Sacramento General Plan. Adopted December 15.

Department of Wildlife and Fisheries Biology. Fish Species of Special Concern in California. June 1995. Website: http://www.dfg.ca.gov/habcon/info/fish_ssc.pdf Accessed August 20, 2008.

Dittes and Guardano Consulting. 2005. IN: Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon. Region 1, U.S. Fish and Wildlife Service, Portland, Oregon. December 15, 2005.

Erikson, C. and D. Belk. 1999. Fairy Shrimps of California's Puddles, Pools, and Playas. Mad River Press. Eureka, CA.

Gallaway Consulting, Inc. 2007a. Draft Delineation of Waters of the United States, PG&E Line 407 Natural Gas Transmission Pipeline. Prepared for TRC. August.

Gallaway Consulting, Inc. 2007b. Special-Status and Listed Plant Report, PG&E Line 407 East Natural Gas Transmission Pipeline. Prepared for TRC. August.

Gallaway Consulting, Inc. 2007c. PG&E Line 407 East Additional Rare Plant Survey. Prepared for TRC. August 6.

Gallaway Consulting, Inc. 2007d. Special-Status and Listed Plant Report, PG&E Line 407 West Natural Gas Transmission Pipeline. Prepared for TRC. August.

Gallaway Consulting, Inc. 2007e. Wet-Season Branchiopod Sampling, PG&E Line 407 East Project. Prepared for TRC. August.

Gallaway Consulting, Inc. 2007f. Valley Elderberry Longhorn Beetle Survey, PG&E Line 407 West Natural Gas Transmission Pipeline. Prepared for TRC. August.

Gallaway Consulting, Inc. 2008a. Addendum to the Delineation of waters of the United States, PG&E Line 407 Natural Gas Transmission Pipeline. July.

Gallaway Consulting, Inc. 2008b. Revised delineation of Waters of the U.S. Maps for PG&E Line 407 Natural Gas Transmission Pipeline Project. December.

Google. Undated. Google Earth version 4.0.2722.

Helm Biological Consulting. 2007. Dry-Season sampling for Federally Listed Large Branchiopods at the PG&E Line 407 East Project. Prepared for Gallaway Consulting, Inc. May.

Hickman, James C. ed. 1993. The Jepson Manual, Higher Plants of California. University of California Press. Berkeley, California.

Hill, James. 1999. Integrating Rice Cultural Practices and Waterfowl Habitat. Dept. of Agronomy & Range Science, University of California, Davis. Available at: http://www.plantsciences.ucdavis.edu/uccerice/DUCKS/waterfwl.htm

Holland, R.F. 1986 (updated 1996). Preliminary Descriptions of the Terrestrial Natural Communities of California. Non-game Heritage Program. California Department of Fish and Game. Sacramento, California.

Jennings, M.R. and M.P. Hayes. 1994. Amphibian and Reptile Species of Special Concern in California. California Department of Fish and Game. Rancho Cordova, California.

Mayer, K.E., and W.F. Laudenslayer, Jr. (eds). 1989. A Guide to Wildlife Habitats of California. California Dept. of Forestry, Sacramento.

Moyle, Peter B. 2002. Inland Fishes of California. Revised Edition. University of California Press, Berkeley, California

National Agriculture Imagery Program (NAIP). 2005. Digital Ortho Photography Covering the Project Study Area.

National Marine Fisheries Service (NMFS). 2000. Critical habitat for 19 Evolutionary Significant units of Salmon and Steelhead in Washington, Oregon, Idaho, and California. 65 FR 7764 7787.

National Marine Fisheries Service (NMFS). 2005. Final Rule: Endangered and Threatened Species; Designation of Critical Habitat for Seven Evolutionarily Significant Units of Pacific Salmon and Steelhead in California. Federal Register Volume 70: No. 170: pp 52489-52627.

National Marine Fisheries Service (NMFS). 2008a. Central-Valley Chinook Salmon Essential Fish Habitat - Fall-Run Distribution Map. Website: http://swr.nmfs.noaa.gov/fall.htm. Accessed August 25, 2008.

National Marine Fisheries Service (NMFS). 2008b. Essential Fish Habitat Webpage. Website: http://swr.nmfs.noaa.gov/efh.htm. Accessed August 25, 2008.

National Marine Fisheries Service (NMFS). 2008c. NMFS Critical Habitat for Chinook Salmon and Steelhead Trout. Website: http://www.nmfs.noaa.gov/pr/species/criticalhabitat.htm. Accessed August 25, 2008.

Naumann, R. 1999. "Lasionycteris noctivagans" (On-line), Animal Diversity Web. Accessed September 01, 2008 at http://animaldiversity.ummz.umich.edu/site/accounts/information/Lasionycteris_noctivagans.html.

Pacific Gas and Electric (PG&E). 2006. Special-Status Amphibian and Reptile Species Habitat Assessment for the Pacific Gas and Electric Company Natural Gas Transmission Line 406/407 Project. August 15, 2006.

Pacific Gas and Electric (PG&E). 2007. Special-Status Avian and Mammalian Species Habitat Assessment for the Pacific Gas and Electric Company Natural Gas Transmission Line 406/407 Project. August 2, 2007.

Placer County. 1994. Placer County General Plan Update. Adopted August 16, 1994.4.

Reeves, Kent. Yolo County Planning Department. Personal communication. Telephone conversation with Deborah Stout on December 12 2008.

Remsen, J.V. 1978. Bird Species of Special Concern in California. California Department of Fish and Game. Rancho Cordova, California.

Riparian Joint Habitat Venture. 2004. Version 2.0. The Riparian Bird Conservation Plan: A Strategy for Reversing the Decline of Riparian associated Birds in California. California Partners in Flight. Website: http://www.prbo.org/calpif/pdfs/riparian.v-2.pdf.

Sober, Breann. Placer County Planning Department. Personal communication. Telephone conversation with Deborah Stout on December 12 2008.

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Website: http://websoilsurvey.nrcs.usda.gov.

Sutter County. 1998. Sutter County General Plan. Adopted October 13, 1998.

TRC. 2007. Fish Habitat Assessment for the Pacific Gas and Electric Company Line 406 and Line 407 Pipeline Project. Prepared for Pacific Gas and Electric Company. August 2007.

U.S. Fish and Wildlife Service (USFWS). 1996a. Sacramento-San Joaquin Delta Native Fishes Recovery Plan. Portland, Oregon.

U.S. Fish and Wildlife Service (USFWS). 1996b. Programmatic Formal consultation Permitting Projects with Relatively Small Effects on the Valley Elderberry Longhorn Beetle Within the Jurisdiction of the Sacramento Field Office, California. Sacramento Fish and Wildlife Office, Sacramento, CA. September 19, 1996.

U.S. Fish and Wildlife Service (USFWS). 1999. Conservation Guidelines for the Valley Elderberry Longhorn Beetle. Sacramento Fish and Wildlife Office, Sacramento, CA. Revised July 9, 1999.

U.S. Fish and Wildlife Service (USFWS). 2002. Recovery Plan for the California Red-Legged Frog; Final. May 28, 2002.

U.S. Fish and Wildlife Service (USFWS). 2005. Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon. Region 1, Portland, OR. December 15, 2005.

U.S. Fish and Wildlife Service (USFWS). 2006. Designation of Critical Habitat for the California Red-Legged Frog, and Special Rule Exemption Associated with

Final Listing for Existing Routine Ranching Activities; Final Rule. April 13, 2006. 71 FR 19243 to 19346.

U.S. Fish and Wildlife Service (USFWS). 2007. Vernal Pool Tadpole Shrimp (*Lepidurus packardi*); 5-Year Review: Summary and Evaluation. September 2007. U.S. Fish and Wildlife Services, Sacramento Fish and Wildlife Office, Sacramento, California.

U.S. Fish and Wildlife Service (USFWS). 2008. List of Endangered and Threatened Species That May Occur in or be Affected by Projects in Citrus Heights, Rio Linda, Taylor Monument, Grays Bend, Woodland, Madison, Esparto, Pleasant Grove, Roseville, Knights Landing, and Verona, California USGS Quadrangle (Document Number 080520024420). Official list obtained from USFWS website on May 20, 2008.

United States Geological Survey (USGS). Citrus Heights, Rio Linda, Taylor Monument, Grays Bend, Woodland, Madison, Esparto, Pleasant Grove, Roseville, Knights Landing, and Verona, California 7.5-Minute Topographic Quadrangle Map. Department of the Interior. U.S. Government Printing Office. Washington D.C.

Western Regional Climate Center (WRCC). 2008. Woodland 1 WNW, California (049781) Period of Record Monthly Climate Summary. Website: http://www.wrcc.dri.edu/summary/Climsmcca.html

Williams, D.F. 1986. Mammalian Species of Special Concern in California. California Department of Fish and Game. Wildlife Management Division Administrative Report. Rancho Cordova, California.

Yolo County. 1983. Yolo County General Plan. Adopted July 17, 1983.

4.5 - CULTURAL RESOURCES

Berkeley Natural History Museum (BNHM). 2007. Berkeley Natural History Museum searchable database. Website: http://bnhm.berkeley.edu/query/index.php.. Accessed April 10, 2007.

Bradley, Denise and Michael Corbett. 1995. Final Rural Historic Landscape Report for Reclamation District 1000 for the Cultural Resources Inventory and Evaluations for the American River Watershed Investigation, Sacramento and Sutter Counties, California. Dames & Moore, Inc., Chico, California.

Submitted to US Army Engineer District, Sacramento, Corps of Engineers. Report #3469 on file, California Historic Resource Information System, North Central Information Center, California State University, Sacramento.

California Department of Parks and Recreation. 1976. California Inventory of Historical Resources. State of California, Resources Agency, Office of Historic Preservation, California Department of Parks and Recreation, Sacramento, California.

California Department of Parks and Recreation. 1988. Five Views: An Ethnic Historic Site Survey for California. State of California, Office of Historic Preservation. California Department of Parks and Recreation, Sacramento, California.

California Department of Parks and Recreation. 1992. California Points of Historical Interest. State of California, Resources Agency, Office of Historic Preservation, California Department of Parks and Recreation, Sacramento, Sacramento, California, Sacramento, California.

California Department of Parks and Recreation. 2003. Historic Properties Directory Listing by City (through August 2005). California Department of Parks and Recreation, Office of Historic Preservation, Sacramento, California.

Conformable Impact Mitigation Guidelines Committee. 1995. Assessment and Mitigation of Adverse Impacts to Nonrenewable Paleontologic Resources: Standard Guidelines. Society of Vertebrate Paleontology News Bulletin 163:22-27.

Sacramento County. 1993. County of Sacramento General Plan. December 15.

Descantes, C. H. 2007. Archaeological Survey Report for the PG&E Line 406 Pipeline Project. Garcia and Associates, Oakland, California. Prepared for CH2M HILL, Oakland, California.

General Land Office. 1857a. Survey Plat for Township 10N, Range 2 East. On file, Bureau of Land Management, Cadastral Survey, Sacramento.

General Land Office. 1857b. Survey Plat for Township 11N, Range 2 East. On file, Bureau of Land Management, Cadastral Survey, Sacramento.

Gilbert, Frank. 1879. The Illustrated Atlas And History Of Yolo County, California Containing A History Of California From 1513 To 1850, A History Of Yolo County From 1825 To 1880.

GPA. 2008. Historic Architectural Survey Report and Finding of Effect for the PG&E Lines 406 and 407 Pipeline Project. Galvin Preservation Associates, Redondo Beach, California.

Gudde, E. G. 1969. California Place Names. Second edition, revised.

Helley, E. J. and D. S. Harwood. 1985. Geologic map of the Late Cenozoic deposits of the Sacramento Valley and Northern Sierran foothills, California. United States Geological Survey Miscellaneous Field Studies Map 1790.

Les, Kathleen. 1986. Yolo County Historic Resources Survey. Les-Thomas Associates and Yolo County Community Development Agency.

Lewis Publication Company. 1891. Yolo County History: A Memorial and Biographical History of Northern California.

Marchand, D. E. and A. Allwardt. 1981. Late Cenozoic Stratigraphic Units, Northeastern San Joaquin Valley, California. United States Geological Survey Bulletin 1470.

Matzen, B. L. 2007. Paleontological Survey and Analysis for the Pacific Gas and Electric Company (PG&E) Line 406 and 407 Expansion Project in Yolo, Sutter, Sacramento and Placer Counties, California. Garcia and Associates, Oakland, California. Prepared for CH2M HILL, Oakland, California.

McElhiney, Michael A. 1992. Soil Survey of San Joaquin County, California. United States Department of Agriculture, Soil Conservation Service, San Joaquin County, California.

Napoli, D. S. 2000. Building, Structure, and Object Record for P-31-1137. In Phase I Evaluation of Cultural Resources, Placer Vineyards, Placer County, California, by R. Windmiller and D. Osana. Report on file at North Central Information Center, California State University, Sacramento.

Placer County. 1994. Placer County General Plan. August 16.

Sarna-Wojcicki, A.N. 1976. Correlation of Late Cenozoic Tuffs in the Central Coast Ranges of California by Means of Trace and Minor Element Chemistry. United States Geological Survey Professional Paper 972.

Sutter County. 1996. Sutter County General Plan-Policy Document. November 25.

TRC. 2007. PG&E Line 406 and Line 407 Expansion Project Description, Revised Draft, January 2007.

United States Geological Survey. 1915. Woodland, CA 7.5-minute Topographic Quadrangle Map. On file, Government Publications, California State Library, Sacramento, CA.

United States Geological Survey. 1941. Woodland, CA 7.5-minute Topographic Quadrangle Map. On file, Government Publications, California State Library, Sacramento, CA.

Waechter, Sharon, Stephen Wee, and Cynthia Toffelmier. 2007. Cultural Resources Inventory for the Sacramento River Water Reliability Study, Sacramento and Placer Counties, California. Far Western Anthropological Research Group, Inc., Davis, California. Prepared for US Department of the Interior, Bureau of Reclamation, Sacramento. On file, California Historical Resource Information System, North Central Information Center, California State University, Sacramento.

Wagner, D. L., C. W. Jennings, T. L. Bedrossian, and E. J. Bortugno. 1987. Geologic Map of the Sacramento Quadrangle, Scale 1:250,000. California Division of Mines and Geology, Sacramento. Map 1a.

Wohlgemuth, Eric, Laura Leach-Palm, Sharon A. Waechter, Mary L. Maniery, and Cindy Baker. 2007. Cultural Resources Survey for the PG&E Line 407/Line 123 Extension/Metro Air Park Distribution Feeder Main Project, Sacramento, Sutter, Placer, and Yolo Counties, California. Far Western Anthropological Research Group, Inc., Davis, California.

Wohlgemuth, Eric. 2008. Cultural Resources Survey for the PG&E Line 407 Project, Placer, Sacramento, Sutter, and Yolo Counties, California. Far Western Anthropological Research Group, Inc., Davis, California.

Wohlgemuth, Eric. 2009. Cultural Resources Survey for the Four Alternative Routes for the Center Joint Unified School District Location, PG&E Line 407 Project, Placer County, California. Far Western Anthropological Research Group, Inc., Davis, California.

Whitaker, Adrian. 2009. Realignment of Segment 406 West Cultural Resources Letter Report. March 27. Far Western Anthropological Research Group, Inc., Davis, California.

Yolo County. 1983. Yolo County General Plan. July 17.

Yolo, County of. 2007. About Yolo County. Website: http://www.yolocounty.org/history.htm.

4.6 - GEOLOGY AND SOILS

Kleinfelder. 2007, Geotechnical Investigation Report, Proposed PG&E Line 406/407 Gas Transmission Pipeline Esparto to Roseville, Yolo, Sutter, and Placer Counties, California: volumes 1 through 11.

Pacific Gas & Electric Company. 2007. Line 407 and 407 Pipeline Project California State Lands Commission Application Preliminary Environmental Analysis. March 8.

State of California, Environmental Protection Agency, Climate Action Team (CAT). March 2006. Climate Action Team Report to Governor Schwarzenegger and the California Legislature. Website: www.climatechange.ca.gov/climate_action_team/reports/index.html.

United States Geological Survey/California Geological Survey, 2002, Probabilistic Seismic Hazard Assessment (PSHA) Model: Revised April 2003.

Wood, H. O., and F. Neumann (1931). Modified Mercalli Intensity Scale of 1931, Bulletin of the Seismological Society of America, Vol. 21, p. 277-283.

4.7 - HAZARDS AND HAZARDOUS MATERIALS

California Department of Education (CDE). 2007. Guidance Protocol for School Site Pipeline Risk Analysis, Volume 1 - User's Manual. February 2007.

EDM Services, Inc. 2009. PG&E Line 406/407 Natural Gas Pipeline Project System Safety and Risk of Upset. April.

Entrix, Inc. 2004. El Paso Line 1903 Pipeline Conversion Project EIR/EA, November.

Hanover Environmental Services Inc. 2008. Screening Level Environmental Site Assessment, June 10.

Hanover Environmental Services Inc. 2008. Supplemental Screening Level Environmental Site Assessment. August.

Health and Safety Executive (HSE). 2001. An Assessment of Measures in Use for Gas Pipelines to Mitigate Against Damage Caused by Third Party Activity. Contract Research Report 372/2001.

National Transportation Safety Board (NTSB). 2002. Pipeline Rupture and Subsequent Fire in Bellingham, Washington, June 10, 1999. Pipeline Accident Report NTSB/PAR-02/02. Washington, DC.

NTSB. 2003. Natural Gas Pipeline Rupture and Fire Near Carlsbad, New Mexico, August 19, 2000. Pipeline Accident Report NTSB/PAR-03/01. Washington, DC.

PG&E Line 108 Natural Gas Pipeline Project EIR, November 2007.

PG&E Line 406 and Line 407 Pipeline Project Preliminary Environmental Analysis, March 8, 2007.

Placer County. 1994. Placer County General Plan. Part 5: Hazardous Materials. August 16. P. 134-135.

Sacramento County. 1997. Hazardous Materials Element of the Sacramento County General Plan. June 25. p. 50-56.

Sacramento County. 1993. Public facilities Element of the County of Sacramento General Plan. Page 38. December 15.

Sutter County. 1996. Hazardous Materials and Wastes. Sutter County General Plan. P. 67 and 68. November 25.

Yolo County. 1983. Yolo County General Plan. Part 1: The Plan and Referenced Environmental Impact Report. Page 36 to 38. July 17.

4.8 - HYDROLOGY AND WATER QUALITY

California Regional Water Quality Control Board. 2002. CWA Section 303(d) List of Water Quality Limited Segments. Website: http://www.swrcb.ca.gov/tmdl/docs/2002reg5303dlist.pdf.

California Regional Water Quality Control Board, Central Valley Region. The Water Quality Control Plan (Basin Plan) [for] the Sacramento River Basin and the San Joaquin River Basin, 4th edition, 1998, revised August 2006. Website: www.swrcb.ca.gov/rwqcb5/available_documents/basin_plans/SacSJR.pdf.

California Stormwater Quality Association. Construction Handbook. 2004. Website; http://www.cabmphandbooks.com/Construction.asp. Accessed August 28, 2008.

Department of Water Resources. Groundwater Data - Map Interface. Website: http://wdl.water.ca.gov/gw/map/index.cfm.

Geology.com. San Francisco, Bay Area and Sacramento Valley - Sea Level Rise Map. Website: http://geology.com/sea-level-rise/san-francisco.shtml.

Pacific Gas and Electric Company. 2004. Water Quality Construction Best Management Practices Manual.

Pacific Gas and Electric Company. 2009. Line 407 Alternative Route Analysis.

Placer County. 1994. Placer County General Plan. August 16.

Regional Water Quality Control Board, Region 5. 2002. Order No. R5-2002-0206, NPDES No. CAS082597. Website: http://www.swrcb.ca.gov/rwqcb5/adopted_orders/Sacramento/R5-2002-0206.pdf.

Sacramento County. 1993. County of Sacramento General Plan, Conservation Element. December 15.

Sacramento County. Sacramento County Code. Website: http://municipalcodes.lexisnexis.com/codes/sacramento_co/.

Sacramento City-County Office of Metropolitan Water Planning. Water Forum EIR. Website: http://www.waterforum.org/ENVIRO.HTM.

State of California, Environmental Protection Agency, Climate Action Team (CAT). March 2006. Climate Action Team Report to Governor Schwarzenegger and the California Legislature. Website: www.climatechange.ca.gov/climate_action_team/reports/index.html.

Sutter County. 1996. Sutter County General Plan-Policy Document. November 25.

Sutter County. Sutter County Watershed. Website: http://www.co.sutter.ca.us/doc/government/depts/pw/wr/ws/wshome.

U.S. Geological Society. Aquifer Basics - Central Valley Aquifer System. Website: http://capp.water.usgs.gov/aquiferBasics/ext_cenvalas.html.

U.S. Geological Society. Ground Water Atlas of the United States, California, Nevada: HA 730-B. Website: http://capp.water.usgs.gov/gwa/ch_b/B-text3.html.

Yolo County. 1983. Yolo County General Plan. July 17.

4.9 - LAND USE AND PLANNING

Pacific Gas & Electric Company (PG&E). 2007. Line 407 and 407 Pipeline Project California State Lands Commission Application Preliminary Environmental Analysis. March 8.

Placer County. 1994. Placer County General Plan. August 16.

Placer County. 2006. Placer Vineyards Specific Plan; Revised Draft Environmental Impact Report. March.

Placer County. 2007. Community Development Resource Agency Placer County. Zoning, Maps. Website: http://www.placer.ca.gov/CommunityDevelopment/Planning/zoneMap.aspx. Accessed January 25, 2007.

Placer County. 2007. Current Projects. Website: http://www.placer.ca.gov/upload/cdr/ecs/currentprojectsjan07team.pdf. Accessed January 25, 2007.

Sacramento, County of. 1993. County of Sacramento General Plan and Land Use Diagram. Website: http://www.saccounty.net/general-plan/gp-home.html. Accessed January 25, 2007.

Sutter County. 1996 General Plan Background Report. Website: http://ceres.ca.gov/planning/genplan/sutter/landuse2.html. Accessed February 5, 2007.

Sutter County. 1996. Sutter County General Plan-Policy Document. November 25.

Sutter County. 2006. Sutter Pointe Specific Plan. July 31.

Sutter County, City of Sacramento, and Natomas Basin Conservancy. 2003. Final Natomas Basin Habitat Conservation Plan. Website: http://www.co.sutter.ca.us/pdf/cs/pc/NBHCP_Vol_1.pdf. Accessed January 25, 2007.

Sutter County Community Services. 2006. Zoning and General Plan Map. Website: http://www.co.sutter.ca.us/doc/government/depts/cs/ps/cs_general_plan. Accessed February 5, 2007.

Yolo County. 2005. Yolo County General Plan Update-Background Report. Website: http://www.yolocountygeneralplan.org/background-report.html. Accessed February 8, 2007.

4.10 - NOISE

Brown-Buntin Associates, Inc. 2009. PG&E Line 406/407 Natural Gas Pipeline Noise Report. April.

City of Roseville. 2004 City of Roseville General Plan, Parks and Recreation Element. February 4.

Federal Interagency Committee on Noise (FICON), 1992, as applied by Brown-Buntin Associates, Inc.

Jones & Stokes. 2004. Transportation- and construction-induced vibration guidance manual. June. (J&S 02-039.) Sacramento, CA. Prepared for California Department of Transportation, Noise, Vibration, and Hazardous Waste Management Office, Sacramento, CA.

Placer County. 1994. Placer County General Plan, Land Use Element. August 16.

Sacramento County. 1993. County of Sacramento General Plan, Open Space Element. December 15.

Sutter County. 1996. Sutter County General Plan-Policy Document, Conservation/Open Space Element. November 25.

Carl E. Hanson et al, U.S. Department Of Transportation (DOT), Federal Transit Administration. 2006. Transit Noise and Vibration Assessment. May.

U.S. Department of Transportation (DOT). Federal Transit Administration. 2006. Transit Noise and Vibration Impact Assessment. May.

Yolo County. 2002. Yolo County General Plan, Open Space and Recreation Element. November.

4.11 - RECREATION

California State Parks. 2008. Website: http://www.parks.ca.gov/?page_id=21299. Accessed September 8, 2008.

City of Roseville. 2004. City of Roseville General Plan, Parks and Recreation Element. February 4.

Placer County. 1994. Placer County General Plan, Land use Element. August 16.

Sutter County. 1996. Sutter County General Plan-Policy Document, Conservation/Open Space Element. November 25.

Yolo County. 2002. Yolo County General Plan, Open Space and Recreation Element. November.

Sacramento County. 1993. County of Sacramento General Plan, Open Space Element. December 15.

4.12 - POPULATION AND HOUSING/PUBLIC SERVICES/UTILITIES AND SERVICE SYSTEMS

Brooks, Janie. Placer County Office of Emergency Services. Personal Communication: May 30, 2008.

California Integrated Waste Management. 2008. Facility/Site Summary Details (SWIS) Website: http://www.ciwmb.ca.gov/SWIS/Search.asp. Accessed May 20, 2008.

California Integrated Waste Management Board (CIWMB). 2008. Countywide, Regionwide, and Statewide Jurisdiction Diversion Progress Report. Website:

http://www.ciwmb.ca.gov/LGTools/mars/jurdrsta.asp. Accessed April 14, 2008.

California Department of Finance. 2007. E-5 Population and Housing Estimates for Cities, Counties, and the State, 2001-2006. Website: http://www.dof.ca.gov/research/demographic/reports/estimates/e-5_2001-06/. Accessed April 17, 2008.

California department of Finance. 2006. E-5 Population and Housing Estimates for Cities, Counties and the State, 2001-2008, with 2000 Benchmark. Sacramento, California.

City of Roseville. 2004. Roseville General Plan, Development Guidelines. February 4.

City of Roseville. 2008. Notice of Preparation of an Environmental Impact Report for the Sierra Vista Specific Plan. Website: http://www.roseville.ca.us/planning/major_development_projects/sierra_vista_specific_plan.asp. Accessed August 11, 2008.

Ed-Data. Education Data Partnership. 2008 Website: http://www.ed-data.k12.ca.us/. Accessed May 5, 2008.

Google Earth. 2008. Aerial photography project area.

Melton, Ruby. City of Sacramento Fire Department. Personal Communication. May 30, 2008.

Norcal Waste Systems Ostrom Road Landfill, INC. Website: http://www.ostromroadlandfill.com/. Accessed May 20, 2008.

Placer County Office of Education. Website: http://www.placercoe.k12.ca.us/index.aspx. Accessed May 5, 2008.

Placer County. 1994. Placer County General Plan. August 16.

Placer, County of. Garbage Disposal and Recycling. 2006. Website: http://www.placer.ca.gov/Departments/Facility/EnvironmentalEngineering/GarbageDisposalSite.aspx. Accessed April 30 2008.

Placer County Water Agency. Website: http://www.pcwa.net/. Accessed April 30, 2008.

Placer, County of. 2007. Placer Vineyard Specific Plan. Online: http://www.placer.ca.gov/Departments/CommunityDevelopment/EnvCoordSvcs/EIR/PVineyards/PVSPSPBase.aspx. Accessed August 11, 2008.

Sacramento County Office of Education. Website: http://www.scoe.net/schools/districts.html. Accessed May 5, 2008.

Sacramento County. 1993. County of Sacramento General Plan, Public Facilities Element. December 15.

Sutter County Fire Districts. 2004. Website: http://www.co.sutter.ca.us/pdf/emergencies/fire/Fire_district.pdf. Accessed May 8, 2008.

Sutter County Superintendent of Schools. Sutter County School Districts. Website: http://www.sutter.k12.ca.us/Content/Districts/map.aspx. Accessed May 5, 2008.

Sutter County. 1996. Sutter County General Plan-Planning Document. November 25.

Pacific Gas and Electric Company (PG&E). 2007. Pacific Gas and Electric Company Line 406 and Line 407 Pipeline Project Supplemental California State Lands Commission Filing, Preliminary Environmental Analysis. October.

U.S. Census Bureau. 2006. Website: http://www.census.gov/. Accessed April 17, 2008.

U.S. census Bureau. 2006. Quickfacts. Website: http://quickfacts.census.gov/qfd/. Accessed April 17, 2008.

Yolo County Office of Education. Yolo County Districts & Schools. Website: http://www.yolo.k12.ca.us/districts_schools/index.html. Accessed May 5, 2008.

Yolo County Sheriff’s Department. Fax transmittal to Michael Brandman Associates. May 30, 2008.

Yolo County. 1983. Yolo County General Plan. July 17.

Yuba-Sutter Disposal, Inc. Website: http://www.ysdi.com/. Accessed May 20, 2008.

4.13 - TRANSPORTATION AND TRAFFIC

California Department of Transportation (Caltrans) Planning Department. 2007. Transportation Concept Report - Interstate 505. Website: http://www.dot.ca.gov/dist3/departments/planning/tcr/tcr505.pdf. Accessed September 16, 2008.

California Department of Transportation (Caltrans) Planning Department. 1997 Transportation Concept Report - Interstate 5. Website: http://www.dot.ca.gov/dist3/departments/planning/tcr/tcr5.pdf. Accessed September 16, 2008.

California Department of Transportation (Caltrans) Planning Department. 2000. Transportation Concept Report - Highway 113. Website: http://www.dot.ca.gov/dist3/departments/planning/tcr/tcr113.pdf. Accessed September 16, 2008.

California Department of Transportation (Caltrans) Planning Department. 2004. Transportation Concept Report - Highway 99. Website: http://www.dot.ca.gov/dist3/departments/planning/tcr/draft99.pdf. Accessed September 16, 2008.

California Department of Transportation (Caltrans) Traffic Data Branch. 2006. Traffic and Vehicle Data Systems Unit 2006 All Traffic Volumes on CSHS. Website: http://www.dot.ca.gov/hq/traffops/saferesr/trafdata/2006all.htm. Accessed September 3, 2008.

City of Roseville. 2004 Roseville General Plan, Parks and Recreation Element. February 4.

County of Sacramento Municipal Services Agency Department of Transportation. 2008. Sacramento County Traffic Counts. Website: http://www.sacdot.com/tools/trafficCounts/. Accessed September 3, 2008.

Esparza, Lilia. Yolo County Planning and Public Works. Personal Communication with Erin Bateau. September 4, 2008.

Placer County. 1994. Placer County General Plan, Land Use Element. August 16.

Placer Vineyards Specific Plan. 2007. Draft Environmental Impact Report. March.

Rose, Jim. Sr. Engineer Technician. Placer County. Personal Communication with Erin Bibeau. September 4, 2008.

Sacramento County. 1993. County of Sacramento General Plan, Open Space Element. December 15.

Sutter County. 2002. South Sutter County Specific Plan Final Environmental Impact Report. March.

Sutter County. 1996. Sutter County General Plan-Policy Document, Conservation/Open Space Element. November 25.

Yolo County. 2002. Yolo County General Plan, Open Space and Recreation Element. November.

4.14 - ENERGY AND MINERAL RESOURCES

California State Mining Bureau. 1888. William Irelan Jr., State Mineralogist. Eighth Annual Report of the State Mineralogist. For the year ending October 1.

City of Roseville. 2004. City of Roseville General Plan, Parks and Recreation Element. February 4.

City of Sacramento. 2006. City of Sacramento General Plan.

Environmental Protection Agency. 2008. New Release: Air. “EPA Releases Greenhouse Gas Document for Public Comment Release date: 07/11/2008.” Website: http://www.epa.gov/newsroom/newsreleases.htm. Accessed October 15, 2008.

Franks, Alvin, Ph.D. Personal Communication with Chelsea Ayala. September 2008.

Placer County. 1994. Horseshoe Bar/Penryn Community Plan. August 16.

Placer County. 1994. Placer County General Plan, Land use Element. August 16.

Sacramento Area Commerce and Trade Organization (SACTO). 2007/2008 Economic Profile. Prepared by Sacramento Regional Research Institute, A joint venture of SACTO and California State University, Sacramento. 2007.

Sacramento County. 1993. Sacramento County General Plan, Energy Element. Background to the 1993 General Plan as Amended. County of Sacramento Planning and Community Development Department. December 15.

Sacramento County. 1993. Sacramento County General Plan, Open Space Element. December 15.

Sutter County General Plan, Energy Element. 1996. Background Report to the General Plan.

Sutter County. 1996. Sutter County General Plan-Policy Document, Conservation/Open Space Element. November 25.

Yolo County. 2008. CCAP In-Channel Maintenance Mining Ordinance Environmental Checklist/Initial Study. March.

Yolo County. 2002. Revised Final Cache Creek Resources Management Plan for Lower Cache Creek. Adopted August 20, 1996. Revised August 15, 2002.

Yolo County. 2002. Yolo County General Plan, Open Space and Recreation Element. November.

5.0 - ENVIRONMENTAL JUSTICE

California State Lands Commission (CSLC). 2002. Environmental Justice Policy.

Sacramento Area Council of Governments (SACOG)2006. Metropolitan Transportation Plan.

US Census Bureau. 2000. 2000 U.S. Census. Website: http://www.census.gov/ Accessed September 2, 2008.

White House. 1994. Executive Order on Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations.

6.0 - OTHER REQUIRED CEQA SECTIONS

CSLC 2008. Personal Communication with Crystal Spurr from Christoffer Ellis of PG&E on April 16, 2008.

7.0 - MITIGATION MONITORING PROGRAM

None.

10.0 ACRONYMS

Acronym	Definition
˚C	Degrees Celsius
˚F	Degrees Fahrenheit
$\mu g/m^3$	Micrograms per Cubic Meter
AB	Assembly Bill
ACHP	Advisory Council on Historic Preservation
ADT	Average Daily Traffic
AG	Attorney General
ANSI	American National Standards Institute
AP	Agricultural Preserve Zone
APCD	Air Pollution Control District
APE	Area of Potential Effects
API	American Petroleum Institute
APM	Applicant Proposed Measure
APN	Assessor’s Parcel Number
AQAP	Air Quality Attainment Plan
AQMD	Air Quality Management District
ARO	Abrasion Resistant Overcoating
ARPA	Archeological Resources Protection Act
ASTM	American Society for Testing and Materials
ATCM	Air Toxic Control Measure
BACT	Best Available Control Technology
Basin Plan	The Water Quality Control Plan for the Sacramento River Basin and San Joaquin River Basin
BEST	Blueprint for Energy Efficiency and Solar Technology
bgs	Below Ground Surface
BMP	Best Management Practice
BP	Before Present
BRS	Baseline Road Pressure Regulating Station
Btu	British Thermal Unit
C&D	Construction and Demolition
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CalEPA	California Environmental Protection Agency
CalOSHA	California Division of Occupational Safety and Health
Caltrans	California Department of Transportation

CARB	California Air Resources Board
CAT	Climate Action Team
CBSC	California Building Standards Commission
CCAA	California Clean Air Act
CCAP	Cache Creek Area Plan
CCAR	California Climate Action Registry
CCIP	Cache Creek Improvement Plan
CCR	California Code of Regulations
CCRMP	Cache Creek Resources Management Plan
CDE	California Department of Education
CDF	California Department of Forestry
CDFG	California Department of Fish and Game
CDMG	California Division of Mines and Geology
CEC	California Energy Commission
CEPA	California Environmental Protection Agency
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFC	Chlorofluorocarbon
CFR	Code of Federal Regulations
CHP	California Highway Patrol
CHWMP	County Hazardous Waste Management Plan
CIWMB	California Integrated Waste Management Board
CMS	Capay Metering Station
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNPS	California Native Plan Society
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalents
CPUC	California Public Utilities Commission
CR	County Road
CRHR	California Register of Historical Resources
CSD-1	County Sanitation District 1
CSLC	California State Lands Commission
CTS	California Tiger Salamander
CUPA	Certified Unified Program Agency
CVRWQCB	Central Valley Regional Water Quality Control Board
CWA	Clean Water Act

CWHR	California Wildlife Habitat Relationship System
D/t	Diameter to Wall Thickness Ratio
dB	Decibel
dBA	A-Weighted Decibel Scale
dbh	Diameter at Breast Height
DDT	Dichloro-diphenyl-trichloro-ethane
DEIR	Draft Environmental Impact Report
DEIS	Draft Environmental Impact Statement
Delta	Sacramento-San Joaquin Delta
DERA	California Department of Environmental Review and Assessment
DFM	Distribution Feeder Main
DMG	California Department of Conservation, Division of Mines and Geology
DO	Dissolved Oxygen
DOC	California Department of Conservation
DOF	Damage from Outside Forces
DOF	California Department of Finance
DOGGR	Division of Oil, Gas, and Geothermal Resources
DOT	United States Department of Transportation
DPM	Particulate Matter from Diesel-Fueled Engines
DSAW	Double Submerged Arc Welding
DWQ	California Department of Water Quality
DWR	California Department of Water Resources
e.g.	Example
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EFZ	Earthquake Fault Zone
EI	Environmental Inspector
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EMD	Sacramento County Environmental Management Department
EMP	Gas System Maintenance and Technical Support Emergency Plan Manual
EP	Environmental Practice
EPA	United States Environmental Protection Agency
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit

FBE	Fusion-Bonded Epoxy
FEMA	Federal Emergency Management Association
FESA	Federal Endangered Species Act
FFA	Future Farmers of America
FICON	Federal Interagency Committee on Noise
FMMP	Farmland Mapping and Monitoring Program
FRAQMD	Feather River Air Quality Management District
FS	Factor of Safety
ft	Foot/Feet
FTA	Federal Transit Administration
GC	PG&E’s General Construction Division
GGS	Giant Garter Snake
GHG	Greenhouse Gas
GLO	General Land Office
GPA	Galvin Preservation Associates
GPS	Global Positioning System
GPTC	Gas Pipeline Technical Committee
GWh/y	Gigawatt-Hours per Year
HABS/HAER	Historic American Buildings Survey/Historic American Engineering Record
HAP	Hazardous Air Pollutants
HCA	High Consequence Area
HCP	Habitat Conservation Plan
HDD	Horizontal Directional Drilling
HLPSA	Hazardous Liquid Pipeline Safety Act of 1979
HSE	Health and Safety Executive
HUD	U.S. Department of Housing & Urban Development Housing
I	Interstate
ICLEI	International Council for Local Environmental Initiatives
in/sec	Inches per second
IPCC	Intergovernmental Panel on Climate Change
J/B	Jack and Bore
km	Kilometers
L 407 E	Line 407 East
L 407 W	Line 407 West
lbs/acre	Pound per Acre
lbs/ft	Pounds per Foot
L_{dn}	Day-Night Average Level

L_{eq}	Equivalent Energy Noise Level
LLC	Limited Liability Company
L_{max}	Maximum Instantaneous Noise Level Experienced During a Given Period of Time
LNG	Liquefied Natural Gas
LOS	Level of Service
MAOP	Maximum Allowable Operating Pressure
MBA	Michael Brandman Associates
MBTA	Migratory Bird Treaty Act
Metro Air Park	Metro Air Park Special Planning Area
MLV	Baseline/Brewer Road Main Line Valve Station
MM	Mitigation Measure
MMcf	Million Cubic Feet
MMI	Modified Mercalli Intensity
MMP	Mitigation Monitoring Program
$MMTCO_2e$	Million Metric Tons of Carbon Dioxide Equivalent
MOA	Memorandum of Understanding
MRZ	Mineral Resources Zone
msl	Mean Sea Level
n/a	Not Applicable
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NAHC	Native American Heritage Commission
NBGCP	Natomas Basin Habitat Conservation Plan
NCCP	Natural Community Conservation Plan
NEPA	National Environmental Policy Act
NGPSA	Natural Gas Pipeline Safety Act of 1968 as amended
NLIP	Natomas Levee Improvement Plan
NMFS	National Marine Fisheries Service
NO_2	Nitrogen Dioxide
NOA	Naturally Occurring Asbestos
NOAA	National Marine Fisheries Service
NOD	Notice of Determination
NOI	Notice of Intent
NOP	Notice of Preparation
NO_X	Oxides of Nitrogen
NPDES	National Pollutant Discharge Elimination System

NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NRPW	Non-Relatively Permanent Waters
NTSB	National Transportation Safety Board
O_3	Ozone
OES	State Office of Emergency Services
OHP	State Office of Historic Preservation
OPR	State Office of Planning and Research
OPS	Office of Pipeline Safety
OSHA	Occupational Safety and Health Administration
PCAPCD	Placer County Air Pollution Control District
PCB	Polychlorinated biphenyl
PCWA	Placer County Water Agency
PG&E	Pacific Gas and Electric Company
PHMSA	Pipeline and Hazardous Materials Safety Administration
PIR	Potential Impact Radius
Placer Parkway	Placer Parkway Corridor Preservation
PLS	Pressure Limiting Station
PM	Particulate Matter
PPV	Peak Particle Velocity
PRC	Public Resources Code
Project	Line 406/407 Natural Gas Pipeline Project
PRS	Powerline Road Pressure Regulating System
PRV	Powerline Road Main Line Valve
psig	Pounds per Square Inch Gauge
PVSP	Placer Vineyards Specific Area Plan
RACT	Reasonably Available Control Technology
RD	Reclamation District
RFP	Reasonable Further Progress Plan
ROG	Reactive Organic Gas
ROP	Rate of Progress
ROW	Right-of-Way
ROWD	Report of Waste Discharge
RPW	Relatively Permanent Waters
RRS	Riego Road Regulating Station
RWQCB	Regional Water Quality Control Board
SAA	Streambed Alteration Agreement
SACOG	Sacramento Area Council of Governments

SB	Senate Bill
SCACD	Southern California Air Conditioning Distributor
SCADA	Supervisory Control and Data Acquisition
SCDWR	Sacramento County Department of Water Resources
SCHWMP	Sutter County Hazardous Waste Management Plan
SCWA	Sacramento County Water Agency
SF_6	Sulfur Hexafluoride
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SMAQMD	Sacramento Metropolitan Air Quality Management District
SMARA	Surface Mining and Reclamation Act
SMGB	State Mining and Geology Board
SMSA	Sacramento Metropolitan Statistical Area
SMUD	Sacramento Municipal Utilities District
SMYS	Specified Minimum Yield Strength
SO_2	Sulfur Dioxide
SOC	Statement of Overriding Considerations
SPCC	Spill Prevention, Containment, and Countermeasures
SPSP	Sutter Pointe Specific Plan
SR	State Route
SRCSD	Sacramento Regional County Sanitation District
SVAB	Sacramento Valley Air Basin
SVSP	Sierra Vista Specific Plan
SWANCC	Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers 531 U.S. 159 (2001)
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
T&R	Transmission and Regulation
TAC	Toxic Air Contaminant
TCE	Temporary Construction Easement
TCM	Transportation Control Measures
therms/y	Therms per year
THPO	Tribal Historic Preservation Officer
TMDL	Total Maximum Daily Load
TMP	Traffic Management Plan
TNW	Traditionally Navigable Waters
TR	Trenching
TUA	Temporary Use Area

U.S.	United States
UCMP	University of California Museum of Paleontology
Unified Program	Unified Hazardous Waste and Hazardous Materials Management Regulatory Program
URBEMIS	URBEMIS2007 v9.2.4
USACE	United States Army Corps of Engineers
USC	United States Code
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VdB	Vibration Decibels
VELB	Valley Elderberry Longhorn Beetle
VOC	Volatile Organic Compound
VRM	Visual Resources Management
WAPA	Western Area Power Administration
Water Code	California Water Code
Wildlands	Wildlands, Inc.
WQC	Water Quality Certification
WRCC	Western Regional Climate Center
YCFCWCD	Yolo County Flood Control and Water Conservation District
YJS	Yolo Junction Pressure Limiting Station
YSAQMD	Yolo County Air Quality Management District