Pacific Gas & Electric

Line 132 – South San Francisco
Pipeline Replacement Routing Analysis

May, 2011

Redacted

Pacific Gas and Electric Company
WE DELIVER ENERGY.

CH2MHILL

Pacific Gas and Electric Company
Line 132 – South San Francisco
Pipeline Replacement Routing Analysis

Table of Contents

A

A. INTRODUCTION AND OVERVIEW

Pacific Gas and Electric Company (PG&E) is committed to performing the work necessary to assure the safety of its gas transmission system. Accordingly, PG&E is constantly prioritizing its projects using the most recent up to date information available. PG&E has a comprehensive inspection and monitoring program to ensure the safety of its natural gas transmission system. PG&E monitors system status on a 24-hour basis, and regularly conducts leak inspections, surveys and patrols of all of their natural gas transmission pipelines. PG&E also uses the data it collects to help plan and prioritize future work. One of the tools that PG&E uses is a risk management program that inventories each of the 20,000 segments within PG&E's natural gas transmission pipeline system and evaluates them against criteria such as:

- The potential for third party damage like dig-ins from construction
- The potential for corrosion
- The potential for ground movement
- The physical design and characteristics of the pipe segment

PG&E also considers the proximity to high density populations, potential reliability impacts and environmentally sensitive areas. Based on all of these factors, PG&E determines which segments warrant further evaluation, monitoring or other future action. PG&E also creates a list of the "Top 100" segments to help formulate future work plans. As conditions change from year to year, PG&E reevaluates the segments included on the list.

As a result of the evaluation process referenced above, PG&E plans to replace an existing 1.4 mile segment of 30 " diameter steel pipe of their Line 132 system that exists in the City of South San Francisco. This analysis was preformed to evaluate various routing alternatives for the replacement of the pipeline. A "preferred route" has been identified that will be further defined, and engineered over the coming months with construction planned for 2012.

B

B. EXECUTIVE SUMMARY

In January of this year, at the direction of PG&E, CH2M HILL identified five routing alternatives for the replacement of 1.4 miles of Line 132, 30" pipe from its crossing of

Redacted

summary shows the five color coded routes that were analyzed as part of this evaluation. The routes are summarized as follows:

Redacted

The following criteria were used to evaluate the five identified routes in the selection of the "preferred" route:

1. **Permitting and Environmental**
2. **Public Impact and Safety**
3. **Existing Utilities**
4. **Constructability and Routing Issues**
5. **Total Installed Costs**

A summary of the findings for each of the criteria listed is provided herein:

1. **Permitting and Environmental**

Ministerial Permits

All of the five potential routes identified will have segments within roadways of the City of South San Francisco with the Red route also crossing into the City of Colma. Preliminary meetings have been held with both cities. With PG&E's existing Franchise Agreement, no problems are expected in obtaining the permits required by either city.

Redacted

No State or Federal permits are anticipated to be required for any of the routing alternatives.

Hazardous Materials Review

An online state and federal data review was performed by CH2M HILL to identify potential environmental areas of concern along the five proposed routes. While areas of previous contamination were identified, based upon the information obtained, none of the areas of concern posed a risk to human health or the environment. Thus none of the five proposed routes should be eliminated due to existing hazardous materials.

Cultural Resources

A cultural resources records search and pedestrian survey of the five potential routes was conducted by Garcia and Associates (GANDA) at the request of CH2M HILL. The records search was conducted by research staff at the Northwest Information Center (NWIC) of the California Historical Resources Information System (CHRIS) at Sonoma State University, Rohnert Park, on April 26, 2011. Four cultural resource sites were identified within or adjacent to the study area, but there are no cultural resources issues with any of the alternative routes proposed.

Biological Resources

A biological resource analysis and pedestrian survey was conducted by GANDA at the request of CH2M HILL for each of the five potential routes. No major biological habitat issues or constraints were identified; however, suitable foraging and nesting habitat for Cooper's hawk was found throughout the study area including the existing pipeline right-of-way. To avoid or minimize potential impacts to nesting birds, all project activities, such as tree removal, excavation, grading and the operation of heavy equipment, should occur to the extent feasible between September 1 and January 31, outside of the nesting season. The pipeline construction is presently scheduled to occur between May and November of 2012. Since this is during the nesting season (February 1 to August 31) a qualified wildlife biologist shall conduct pre-construction surveys for nesting birds. During surveys the qualified biologist shall carefully search for active nests/burrows within the work zone and a surrounding buffer zone. If an active nest is found, the bird species shall be identified and the approximate distance from the closest work site to the nest shall be estimated. At that time, the biologist shall implement appropriate mitigation measures that are discussed in more detail later in this report.

2. Public Impact and Safety

Redacted and the BART right-of-way appear to parallel an area of high liquefaction potential. The Red, Blue, Orange and Purple routes have segments that are 3,000 to 6,000 feet long that are within the high liquefaction potential areas. The Yellow Route would appear to cross the high liquefaction potential area for about 1,400 feet, which is the shortest distance of the five routes evaluated.

It is recommended that in the design phase of the preferred route, a subsurface soil investigation be performed. The results of the soil investigation will be used to assess the liquefaction potential of the underlying soils during the occurrences of major earthquakes in the region, and if needed, mitigation measures to reduce the liquefaction hazards, and assure that the pipeline will be safe, will be implemented

3. Existing Utilities

Goodbee & Associates, a utility coordination company, under the direction of CH2M HILL, contacted the Underground Service Alert – North (USA-North) for initial identification of private utility companies and municipalities with facilities near the study area. The identified companies and departments were contacted, and maps or verbal descriptions of the facilities were obtained. Follow-up field reconnaissance confirmed the findings and provided additional information. Certain utilities were classified as "major utilities" by Goodbee and CH2M HILL because of the higher cost of relocation. These included: electric transmission (kV) lines; water lines, gas lines and sanitary/storm sewers greater than 12 inches in diameter; and fiber optic ducts.

The chart below is a summary of the major and total utilities identified for each of the five routes along with Mission Road and the BART right-of-way.

	Blue (Existing)	Orange Redacted	Purple Redacted	Yellow (Redacted)	Red (Redacted)	Redacted	BART
Major Utilities*	13	12	19	18	16	10	9
Total Utilities **	88	251	285	127	98	106	43

It should be noted that there may be buried utilities that were not included in information obtained from utility companies and which were not apparent from the surface. As such, this utility inventory should be supplemented by utility locates and potholing and coordination with USA-North once the preferred route is selected.

4. Constructability

While all of the routes are considered constructible, the existing (Blue) route, Redacted (Orange) route and Redacted (Purple) Route are the least desirable from a construction standpoint for the following reasons:

- Very narrow right-of-ways or streets
- High concentrations of utilities (especially the Orange & Purple routes)
- High estimated construction costs (especially Blue & Orange routes)

5. Total Installed Costs

The table below summarizes the Association for the Advancement of Cost Engineering (AACE) Class 5 cost estimates that were developed for each of the five potential routes. AACE Class 5 estimates typically translate to an accuracy range of between -20% to -50% low to +30% to +100% high. The estimates include only materials, engineering design and construction costs, and do not include PG&E internal costs or other items further detailed in Section 5 of this report.

Costs are shown in millions of dollars

	Red Route	Blue Route	Orange Route	Purple Route	Yellow Route
Materials	$ 2.0	$ 1.6	$ 1.7	$ 1.5	$ 1.5
Engineering Design	$ 1.1	$ 0.9	$ 1.0	$ 1.0	$ 0.9
Construction	$ 5.2	$ 5.8	$ 5.4	$ 4.7	$ 4.0
Total Cost	**$ 8.3**	**$ 8.3**	**$ 8.1**	**$ 7.2**	**$ 6.4**

Recommended Preferred Route

Utilizing all of the data gathered and developed in evaluating the five alternative routes, it is the agreement of the PG&E project team that although it is the longest and possibly the most expense, the preferred route is the Redacted (Red) Route for the following reasons:

1) Placing the pipeline in the Redacted will minimize the potential for third party excavation damages which is the number one cause of damage to underground pipelines. Hence, it is the safest route for the long term.

2) It will be one of the easiest and safest routes to construct as it has relatively few major utility crossing (16) and the second lowest total utility crossings (98).

3) The BART right-of-way and streets are relatively wide for ease of construction.

4) This is the preferred route of the City of South San Francisco. The city has offered to help PG&E with Public Outreach to address business and residential concerns and issues.

Redacted

Legend

Redacted

Line 132 - South San Francisco

Pipeline Replacement Project

Alternative Routes

CH2MHILL

Pacific Gas and Electric Company®

Date Issued: May 4, 2011

GVO Hiwan\\GIS\projectdata\Working\SouthSanFrancisco\Line_132_05-04-11.mxd EKA 05/04/11

C

C. ROUTING ALTERNATIVE ANALYSIS

1. PERMITTING AND ENVIRONMENTAL ANALYSIS

Ministerial Permit Summary

CH2M HILL has studied the five alternative routes for the proposed replacement of a segment of Line 132 through South San Francisco. Each alternative route is designated by a separate color as shown on the Alternatives Route map in the Executive Summary, Section B of this report. The blue line represents the pipeline in its current location with the other lines representing relocation alternatives of the pipeline. Herein is an overview of the ministerial permits processes and anticipated timelines required for each of the potential routes.

Any route chosen will require obtaining a crossing agreement with BART. We anticipate the process to get a crossing agreement to be fairly routine given that PG&E has an existing easement across BART, although the processing time will likely take 3 to 6 months. The red, orange, and purple routes would each require obtaining a longitudinal easement in the BART right-of-way. We are in discussions with BART about this possibility.

Redacted

No federal or state permits are anticipated to be required for any of the routing alternatives.

Conclusion

PG&E may encounter resistance from BART in our attempt to obtain an encroachment Redacted

Redacted. We are in discussions with BART at this time, and hope to have an answer from them by mid-May. Otherwise, no other major issues or constraints appear to exist concerning Ministerial Permits for any of the five alternative routes.

The attached spreadsheet summarizes the Ministerial Permitting process with each agency involved.

Line 132 South San Francisco Replacement Project Permit List

Agency	Permit	Contact info	Process Time (submitted and deemed complete)	Applicaton Fee	Application info	Comments
PRIVATE PROPERTY						
POB & POT ?						
FEDERAL						
None identified						
STATE						
None identified						
County						
San Mateo County Redacted **- only a very small portion thereof near the POT as this roadway or at least a portion thereof, falls within Colma's City Limits)**	**Encroachment Permit**	Richard Lee Dept. of Public Works San Mateo County 455 County Center, 2/Fl. Redwood City, CA 94063 (650) 363-1852	To be determined after dicussion with Richard.	To be determined	Permit application, instructions, and fee schedule are in file.	Small (if any) enroachment on Hillside. Richard was out of office last week. Tom to contact and discuss process on Tuesday 5/3.
City						
City of South San Francisco Redacted Redact	**Encroachment Permit**	City of South San Francisco Engineering Division 315 Maple Avenue South San Francisco, CA 94080 (650) 829-6652	Per discussion at meeting one to two weeks after submission of plans.	None discussed. Will likley need deposit for plan review and inspection.	Application found at http://www.ci.ssf.ca.us/index.aspx?NID=351	We met with city engineers on 4/13. Permit approval can be processed over the counter.
City of Colma Redacted **R d. to the POT)**	**Encroachment Permit**	Brad Donahue Town of Colma Deputy Public Works Director 1188 El Camino Real Colma, CA 94104-3212 (650) 757-8895 brad.donahue@colma.ca.gov	Estimate 90 to 120 days based on need for council approval.	None discussed. Will likley need deposit for plan review and inspection.	Encroachment permit application found online at: http://www.colma.ca.gov/index.php?option=com_docman&Itemid=111	We met with Brad on 4/13. Will need Town Council approval. Brad requested letter providing an overview of the request prior to submission of application and drawings.
Railroads/Transit						
BART	**Crossing Permit**	Gary Anderson San Francisco BART District Real Estate Department 300 Lakeside Drive, 22nd Floor Oakland, CA 94612 E-mail: ganders@bart.gov Phone: (510) 464-6676 Fax: (510) 464-7583	**Up to 6 months if new easment.** 6 to 8 weeks if in existing easement.	Deposit determined by BART after submission of drawings and application.	Application available online at http://www.bart.gov/about/business/permits/repermits.aspx	Construction specs subject to BART guidelines found at http://www.bart.gov/docs/SUB.pdf
BART	**Longitudinal Easement**	Gary Anderson San Francisco BART District Real Estate Department 300 Lakeside Drive, 22nd Floor Oakland, CA 94612 E-mail: ganders@bart.gov Phone: (510) 464-6676 Fax: (510) 464-7583	Unknown	Deposit determined by BART after submission of drawings and application.	Application available online at http://www.bart.gov/about/business/permits/repermits.aspx	Meeting was held with BART officials on 4/27. CH2M Hill to prepare proposed design for locating in BART ROW.
Misc.						
San Mateo County Flood Control	**Encroachment Permit**	Mark Chow, PE Senior Civil Engineer 555 County Center Fifth Floor Redwood City, CA 94063 (650) 599-1489 mchow@co.sanmateo.ca.us	Per Mark 6 to 8 weeks from submission.	None - Will require deposit for inspection during construction.	No formal application. Submission of drawings and a cover letter. No application fee.	Preliminary plans allowable. No stated policy for clearance under canal but subject to engineering review.

Hazardous Materials Review

Database Review

An online data review was performed to identify environmental areas of concern along the five proposed routes under consideration for the South San Francisco Pipeline Replacement Project. The review included searches of the following databases:

- California Environmental Protection Agency (EPA) State Water Resources Control Board Geotracker (Geotracker),
- California EPA State Solid Waste Information System (SWIS) Facility / Site Listing, and
- U.S. EPA CERCLIS (CERCLIS) internet databases

Consultations with federal, state and / or local environmental and solid waste management officials were not performed for this phase of the route analysis, but will occur once the preferred route is selected.

SWIS, a database used by the State Board, regional boards and local agencies in California to track and archive compliance data from existing and historic permitted and non-permitted waste disposal and landfill sites, identified no landfills or waste disposal sites impacting the five proposed routes. As well, CERCLIS, a database managed by the U.S EPA, used in the identification of sites determined to be Superfund Clean-up Sites and tracked as either listed or non-listed on the National Priority List, also identified no contaminated sites in and around the areas of the five proposed routes.

Geotracker is also a database used by the State Board, regional boards and local agencies to track and archive compliance data of authorized and / or unauthorized discharges of waste to land, as well as unauthorized releases of hazardous substances from underground storage tanks. Geotracker identified a total of 13 sites along the proposed pipeline routes as having previous or existing environmental conditions requiring that clean-up and / or remediation activities be performed. The contamination at these sites was identified as the result of Leaking Underground Storage Tanks (LUSTs), or other operational sources. Of the 13 sites, 8 are / were managed as LUST Clean-up Sites with the remaining managed as Other Clean-up Sites, including one site managed under the Toxic Substance Control Act (TSCA) as a DTSC Cleanup Site; Hillside Nursery located along the Chestnut Ave / Hillside Blvd route.

Hazard Material Findings

The Hillside Nursery site has been remediated and closed. The Contaminants of Concern (COC) were pesticides containing DDT, DDD, and DDE and the media impacted was limited to surface and subsurface soils; the exact location of the area of impact was not provided. Clean-up activities at the site consisted of excavation of the top 6" of soil. The contaminated soils were removed and disposed in a hazardous

materials landfill. According to Geotracker, the site was sold and developed into single family homes. To date, clean-up activities at all but two of the 13 sites are complete and the cases closed, with the remaining two currently open and undergoing remediation activities; Contreras Painting and Chevron, formerly Standard Oil Substation, potentially impacting the existing and proposed Forest View Drive pipeline routes .

The 13 sites are comprised of former gas stations, nurseries, auto repair shops, a paint shop, and a construction company. The COC range from petroleum products including gasoline, waste oil, motor oil and hydrologic fluid, to paint solvents, PCBs and pesticides (DDT, DDE, DDD) impacting soils and, in some cases, groundwater. Table 1, defines the areas of concern along each of the proposed routes and includes three additional sites identified in the general vicinity; southwest of the South San Francisco BART along Mission Road. The table provides details including site name; address; affected media; COC; agency case numbers; clean-up status; and, if installed, groundwater monitoring wells, with depth to ground water, at or near the site locations.

Conclusions

Along with the proposed routes, all sites identified have been plotted and provided on the map titled Table 1 - Historic Environmental Areas of Concern

Based upon the information evaluated, it is determined no areas of concern posing risk to human health and the environment are present. Thus, each of the five proposed routes shall be considered viable alternatives for the replacement of the PG&E pipeline.

Table 1: Pipeline Route Areas of Concern_Site Details (Cont'd)

Route	Site No.	Site Name and Address	Media Affected	Contaminants of Concern	LUST Clean-up Site y/n	GW Monitoring Wells (min depth/ max depth to water)	RB Case No.[1]/ Loc Case No.[2]	Clean-up Status
Redacted *(Yellow)*	2	**Acutec Autos** 45 Chestnut Ave. South San Francisco, CA	Soil/Groundwater *(uses other than drinking water)*	Gasoline	y	n/a	RB Case #: 41-0007 Loc Case #: 550089	Complete- Case Closed 5/13/2003
	4	**Chevron - former Standard Oil Substation** 972 El Camino RealSouth San Francisco, CA	Soil/Groundwater *(uses other than drinking water)*	Gasoline	y	**MW-1:** 29.49'/ 30.58' **MW-2:** 30.51'/ 31.75' **MW-3:** 29.98'/ 31.00'	RB Case #: n/a Loc Case #: 550196	Open- Verification Monitoring as of 3/9/2010
	6	**Delano Nursery** 541 Chestnut Ave. South San Francisco, CA	Soil	Gasoline	y	n/a	RB Case #: 41-0305 Loc Case #: 550102	Complete- Case Closed 9/14/1993
	7	**Delano Nursery II** 541 Chestnut Ave. South San Francisco, CA	Soil	PCBs	n	n/a	RB Case #: n/a Loc Case #: 559007	Complete- Case Closed 6/25/1996
	8	**Finley Construction** 125 Chestnut Ave. South San Francisco, CA	Soil	Gasoline	y	n/a	RB Case #: 41-0226 Loc Case #: 550046	Complete- Case Closed 7/9/1992
	9	**Gemignani Nursery** 613 Chestnut Ave. South San Francisco, CA	Soil	Unk- Not Listed	n	n/a	RB Case #: 41-0956 Loc Case #: 559006	Complete- Case Closed 6/25/1996
	10	**Hillside Nursery** Hillside Blvd & Chestnut Ave South San Francisco, CA	Soil	DDD, DDE, DDT (Pesticides)	N	n/a	Dept of Toxic Substances Control ID: 41070007	No Action Required as of 2/8/2007 Site formerly as nursery, developed into single family homes. Preliminary site investigations show residual DDT contamination on surface and subsurface soil. Excavated top 6" of soil; transported to hazardous waste landfill.
	11	**Ron Price Motors** 1 Chestnut Ave South San Francisco, CA	Soil	Waste Oil, Motor Oil, Hydraulic/ Lubricating fluids	y	n/a	RB Case #: 41-0453 Loc Case #: 550087	Complete- Case Closed 1/8/1996
	12	**Silver Terrace Nursery** 525 Chestnut Ave. South San Francisco, CA	Soil	Unk- Not Listed	N	n/a	RB Case #: 41-0954 Loc Case #: 559008	Complete- Case Closed 6/61996
	13	**Silver Terrace Nursery II** 525 Chestnut Ave. South San Francisco, CA	Soil	Gasoline	y	n/a	RB Case #: 41-1140 Loc Case #: 550146	Complete- Case Closed 4/29/1996
Sites within the General Vicinity of Proposed Routes	14	**SSF BART Property (former Costco)** 1600 El Camino Real South San Francisco, CA	Soil	Gasoline	n	n/a	RB Case #: n/a Loc Case #: 559179	Complete- Case Closed 12/29/03
	15	**SF Garden Mart** 1400 El Camino Real South San Francisco, CA	Soil	Gasoline	y	n/a	RB Case #: 41-0480 Loc Case #: 550078	Complete- Case Closed 8/7/1991
	16	**Broadmoor Lumber & Plywood CO** 1350 El Camino Real South San Francisco, CA	Soil	Gasoline	y	n/a	RB Case #: 41-0089 Loc Case #: 540147	Complete- Case Closed 7/3/1995

SOURCE: CALIFORNIA STATE WATER RESOURCES CONTROL BOARD GEOTRACKER

HAZARD REVIEW
PG&E SOUTH SAN FRANCISCO PIPELINE REPLACEMENT PROJECT
SAN MATEO COUNTY, CA

Table 1: Pipeline Route Areas of Concern_Site Details

Route	Site No.	Site Name and Address	Media Affected	Contaminants of Concern	LUST Clean-up Site y/n	GW Monitoring Wells (min depth/ max depth to water)	RB Case No.[1]/ Loc Case No.[2]	Clean-up Status
Redacted *(Red)*	1	**Abby Homestead Nursery** 1899 Hillside Blvd, Colma, CA	Soil	Gasoline	y	n/a	RB Case #: 41-0686 Loc Case #: 780012	Complete -Case Closed 12/13/1999
	2	**Acutec Autos** 45 Chestnut Ave. South San Francisco, CA	Soil/ Groundwater *(uses other than drinking water)*	Gasoline	y	n/a	RB Case #: 41-0007 Loc Case #: 550089	Complete- Case Closed 5/13/2003
	3	**Chevron 9-1626** 1198 Old Mission Rd South San Francisco, CA	Soil/ Groundwater *(uses other than drinking water)*	Gasoline	y	**MW-10:** 27.76'/ 28.62 **MW- 11:** n/a **MW-12:** 15.40'/ 28.08' **MW-13:** n/a **MW-14:** n/a **MW-15:** 26.84'/ 27.75' **MW-16:** 26.91'/ 27.90' **MW-18:** 13.92'/ 17.87' **VE-3:** 13.15'/ 14.48'	RB Case #: 41-0121 Loc Case #: 550012	Complete -Case Closed 10/25/2005
	4	**Chevron - former Standard Oil Substation** 972 El Camino Real South San Francisco, CA	Soil/ Groundwater *(uses other than drinking water)*	Gasoline	y	**MW-1:** 29.49'/ 30.58' **MW-2:** 30.51'/ 31.75' **MW-3:** 29.98'/ 31.00'	RB Case #: n/a Loc Case #: 550196	Open- Verification Monitoring as of 3/9/2010
	11	**Ron Price Motors** 1 Chestnut Ave South San Francisco, CA	Soil	Waste Oil, Motor Oil, Hydraulic/ Lubricating fluids	y	n/a	RB Case #: 41-0453 Loc Case #: 550087	Complete- Case Closed 1/8/1996
Redacted *(Orange)*	1	**Chevron 9-1626** 1198 Old Mission Rd South San Francisco, CA	Soil/ Groundwater *(uses other than drinking water)*	Gasoline	y	**MW-10:** 27.76'/ 28.62 **MW- 11:** n/a **MW-12:** 15.40'/ 28.08' **MW-13:** n/a **MW-14:** n/a **MW-15:** 26.84'/ 27.75' **MW-16:** 26.91'/ 27.90' **MW-18:** 13.92'/ 17.87' **VE-3:** 13.15'/ 14.48'	RB Case #: 41-0121 Loc Case #: 550012	Complete -Case Closed 10/25/2005
	2	**Acutec Autos** 45 Chestnut Ave. South San Francisco, CA	Soil/ Groundwater *(uses other than drinking water)*	Gasoline	y	n/a	RB Case #: 41-0007 Loc Case #: 550089	Complete- Case Closed 5/13/2003
	4	**Chevron - former Standard Oil Substation** 972 El Camino Real South San Francisco, CA	Soil/ Groundwater *(uses other than drinking water)*	Gasoline	y	**MW-1:** 29.49'/ 30.58' **MW-2:** 30.51'/ 31.75' **MW-3:** 29.98'/ 31.00'	RB Case #: n/a Loc Case #: 550196	Open- Verification Monitoring as of 3/9/2010
	11	**Ron Price Motors** 1 Chestnut Ave South San Francisco, CA	Soil	Waste Oil, Motor Oil, Hydraulic/ Lubricating fluids	y	n/a	RB Case #: 41-0453 Loc Case #: 550087	Complete- Case Closed 1/8/1996
Redacted *(Purple)*	2	**Acutec Autos** 45 Chestnut Ave. South San Francisco, CA	Soil/Groundwater *(uses other than drinking water)*	Gasoline	y	n/a	RB Case #: 41-0007 Loc Case #: 550089	Complete- Case Closed 5/13/2003
	4	**Chevron - former Standard Oil Substation** 972 El Camino Real South San Francisco, CA	Soil/Groundwater *(uses other than drinking water)*	Gasoline	y	**MW-1:** 29.49'/ 30.58' **MW-2:** 30.51'/ 31.75' **MW-3:** 29.98'/ 31.00'	RB Case #: n/a Loc Case #: 550196	Open- Verification Monitoring as of 3/9/2010
	5	**Contreras Painting** 1090 Grand Ave South San Francisco, CA	Soil/Groundwater *(uses other than drinking water)*	Stoddard Solvent/ Mineral Spirits/ Distillates	n	**MW-1:** 5.10'/ 14.05 **MW-2:** 9.73'/ 11.29' **MW-3**: 10.90'/ 12.62' **MW-4:** 8.78/ 16.60'	RB Case #: n/a Loc Case #: 559177	Open- In Remediation as of 1/7/2005
	11	**Ron Price Motors** 1 Chestnut Ave South San Francisco, CA	Soil	Waste Oil, Motor Oil, Hydraulic/ Lubricating fluids	y	n/a	RB Case #: 41-0453 Loc Case #: 550087	Complete- Case Closed 1/8/1996

SOURCE: CALIFORNIA STATE WATER RESOURCES CONTROL BOARD GEOTRACKER

Redacted

Legend

Cleanup Sites

ACTIVE

Redacted

Green Belt/Lawndale Blvd. (SSF-4)

South San Francisco Pipeline Replacement Project

Historic Environmental Areas of Concern

CH2MHILL

Date Issued: April 14, 2011

GVO Hiwan\\GIS\projectdata\Working\SouthSanFrancisco\South_San_Francisco_cleanup_04-14-11.mxd EKA 04/14/11

Cultural Resources

This report identifies the locations of cultural resources, which are confidential. Disclosure of this information to the public may be in violation of both federal and state laws. To discourage damage resulting from vandalism and artifact looting, cultural resources locations should be kept confidential, and report distribution restricted. This report, prepared by Garcia and Associates (GANDA), at the request of CH2M HILL is available upon request, and verification of need and intent.

Introduction

This cultural resources memorandum was prepared by Garcia and Associates (GANDA) to present the results of a cultural resources records search and pedestrian survey conducted for a portion of the existing Gas Line 132 Right-of-Way (ROW) in South San Francisco, San Francisco County.

Records Search Methods

A records search was conducted by research staff at the Northwest Information Center (NWIC) of the California Historical Resources Information System (CHRIS) at Sonoma State University, Rohnert Park, on April 26, 2011. The NWIC is a repository of all archaeological site records, previously conducted cultural resources investigations, and historic information concerning cultural resources for the 16 county Bay Area, including San Mateo County. The purpose of this records search was to compile information pertaining to cultural resource sensitivity within the 0.25-mile radius for the study area, including the locations of previously recorded cultural resource sites. The records search findings for this brief memorandum are based solely on the data collected from the NWIC (File No. 10-1035).

The following sources were consulted in this records search:

- NWIC base maps: United States Geological Survey (USGS) 7.5-minute series topographic quadrangle for South San Francisco, California.
- Pertinent survey reports and archaeological site records within or immediately adjacent to the study area (examined to identify recorded archaeological sites and historic-period architectural resources, such as buildings, structures, and objects).
- The California Department of Parks and Recreation's *California Inventory of Historic Resources* (1976) and the Office of Historic Preservation's *Historic Properties Directory* (OHP) (2011), which combines cultural resources listed on the California Historical Landmarks, California Points of Historic Interest, and those that are listed in or determined eligible for listing in the National Register of Historic Places (NRHP) and California Register of Historical Resources (CRHR).

Summary of Conclusions

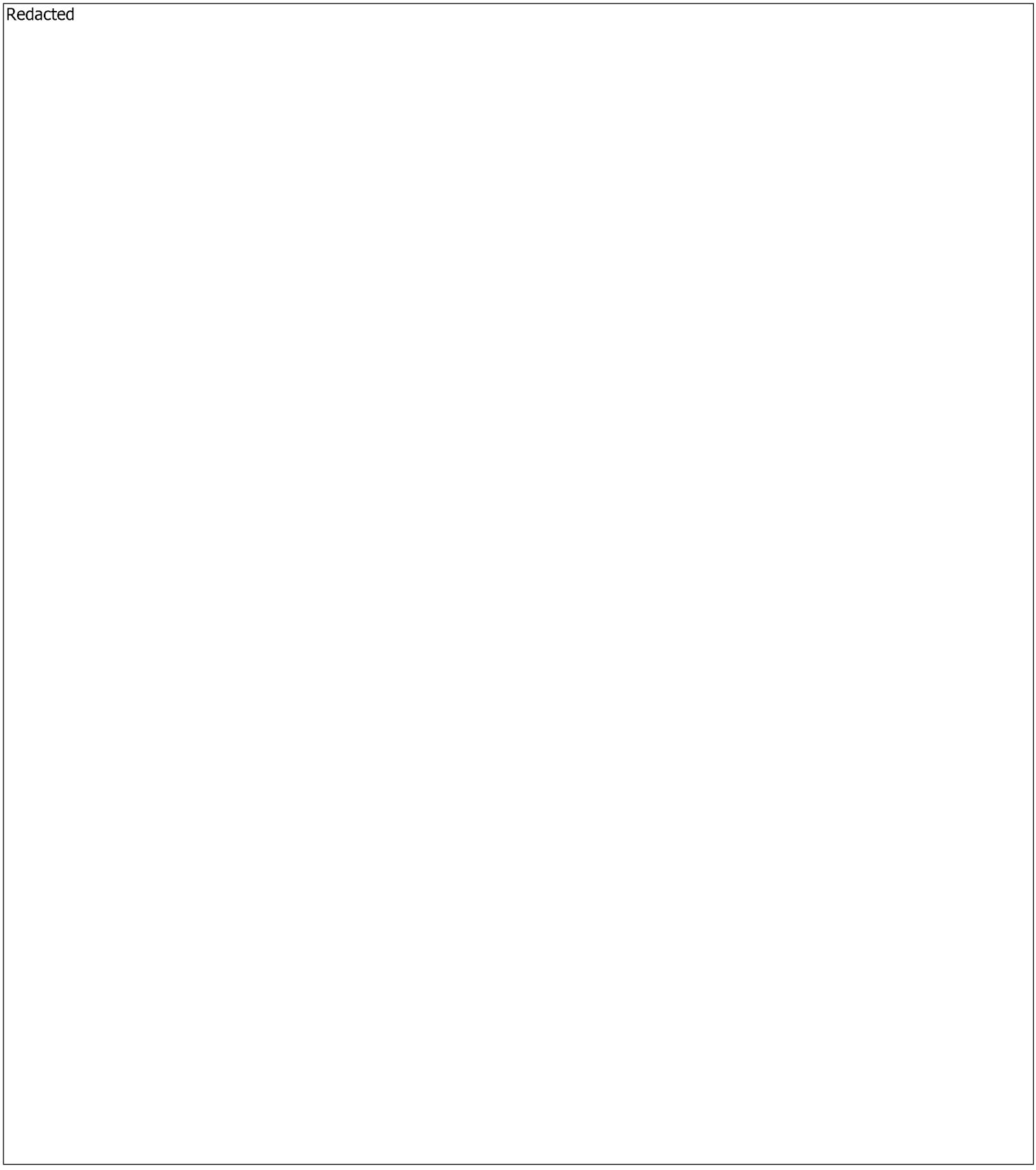
The results of the records search indicate that 26 previous cultural resources investigations have been completed within a 0.25-mile radius of the study area. These studies resulted in the identification of 17 cultural resources, two of which are located within the study area and two of which are adjacent or less than 200 feet from the study area. Redacted Redacted ; however this resource is situated approximately 350 feet east of the study area.

The four resource sites identified adjacent to or within the project study area include: a Redacted ; two single-family residential homes; and a 1.5 acre open lot. A survey conducted in 1994 at the shell midden site failed to identify any additional cultural materials or deposits; however, Archaeological monitoring was recommended for future ground disturbing activities within and / or near the boundaries. The two residential homes and the open lot were evaluated and recommended as ineligible for listing in the NRHP. No newly identified cultural resources were observed during the pedestrian survey. The pedestrian survey did not include the documentation of architectural resources and / or built environment features other than those previously recorded.

As a result, construction activities associated with the replacement of L-132 are not likely to result in impacts to cultural resources along any of the proposed alternative routes.

Sensitive Receptors

The attached map titled “Sensitive Receptors within 1 Mile of Gas Line 132 Alternative Routes” shows the location of schools and other learning centers that might be affected due to increased noise levels during construction. This issue will need to be reviewed and further considered before construction.


Redacted
Project Location
Redacted
1 Mile Buffer of Project Area
Hospital
School
Day Care Center
Sensitive Receptors Within 1 Mile of Gas Line 132 Alternative Routes
0 0.25 0.5
Miles
0 0.5 1
Kilometers

Biological Resources

The complete report, prepared by Garcia and Associates (GANDA), at the request of CH2M HILL consists of several hundred pages due to the inclusion of California National Diversity Database (CNDDB) records for Special-status Species. A copy of the report is available upon request, and verification of need and intent.

Herein is a summary of the potential biological resource constraints related to the existing Gas Line 132 ROW and 4 alternative routes. Recommended measures to reduce the likelihood and magnitude of adverse temporary and / or permanent impacts to biological resources that could result from implementation of this project are discussed below.

Gas Line 132 ROW (Blue Route - existing alignment)

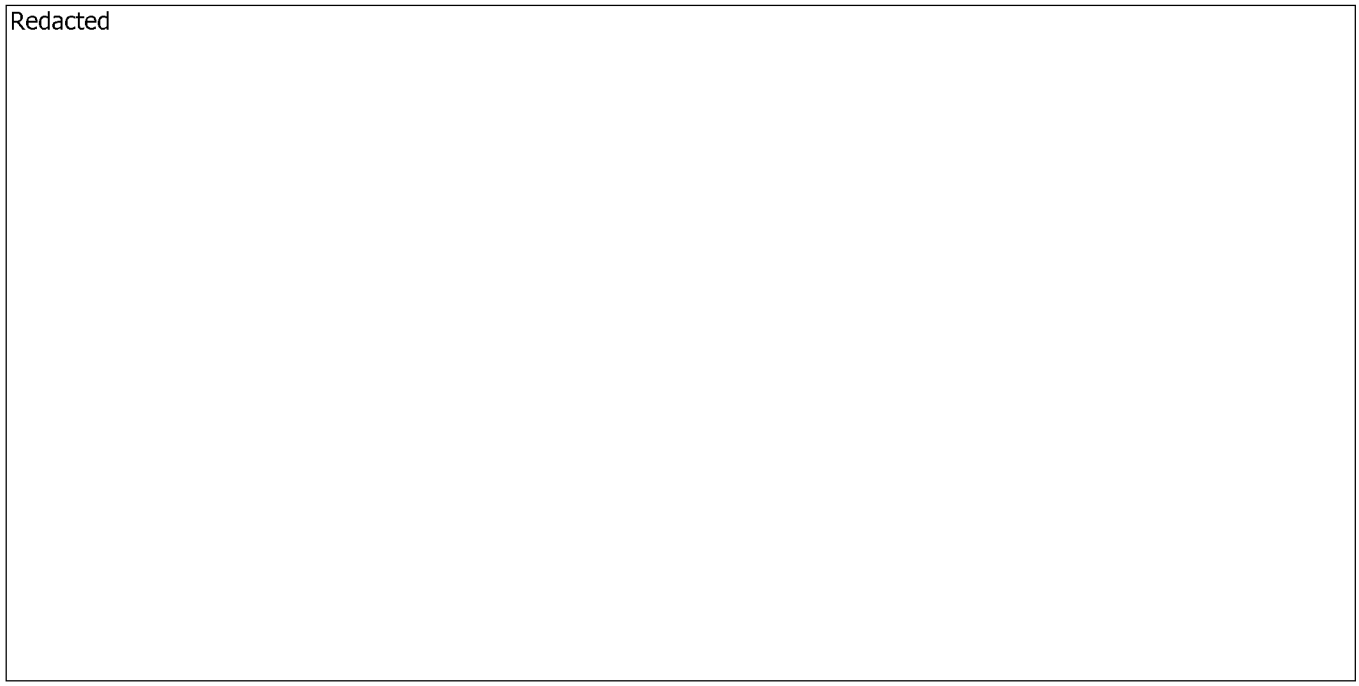
Redacted

implemented then impacts to Cooper's hawk will be avoided.

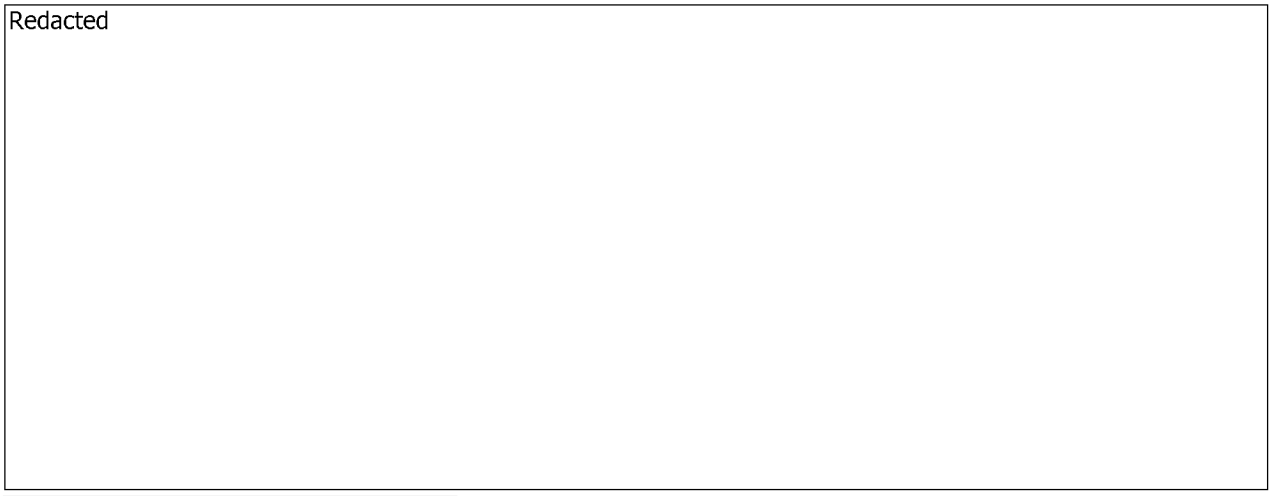
Redacted

Alternative (Orange Route)

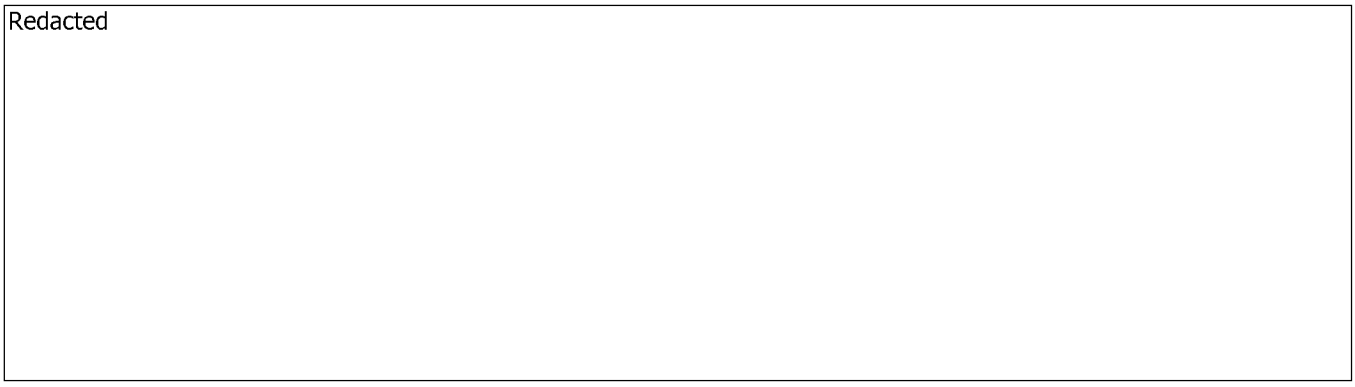
Redacted



Redacted **Alternative (Purple Route)**



Redacted **Alternative (Yellow Route)**



Cooper's hawk and other nesting birds have potential to nest in/along this alternative. But if the recommended nesting bird measures below are implemented then impacts to Cooper's hawk will be avoided.

Redacted **Alternative. (Red Route)**

Redacted

Recommended Minimization Measures

Nesting Birds

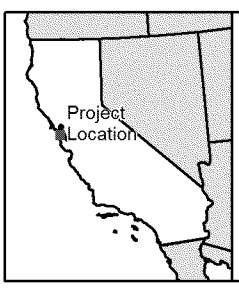
Active nests of most bird species are protected by the federal Migratory Bird Treaty Act and Section 3503 of the California Fish and Game Code (CFGC). Raptor nests are also protected under Section 3503.5 of the CFGC. Additional protections would apply to special-status bird species.

Construction activities could adversely affect raptors and other species of birds that nest on or in the vicinity of the study area. Trimming or removal of vegetation could destroy or disturb active nests. The operation of equipment, generation of noise and increased human presence on the site could disrupt nesting, feeding, or other life cycle activities and could result in nest abandonment or nesting failure.

To avoid or minimize potential impacts to nesting birds, all project construction activities, such as tree removal and/or tree trimming, excavation, grading, and the operation of heavy equipment, should occur to the extent feasible between September 1 and January 31, outside of the nesting season. If project construction activities must occur during the period from February 1 to August 31 a qualified wildlife biologist shall

conduct pre-construction surveys for nesting birds. During surveys the qualified biologist shall carefully search for active nests/burrows within the work zone and a surrounding buffer zone. If an active nest is found, the bird species shall be identified and the approximate distance from the closest work site to the nest shall be estimated. No additional measures shall be implemented if active nests are more than the following distances from the nearest work site: (a) 300 ft for raptors; (b) 500 feet for golden eagles or (c) 75 feet for passerine birds. If active nests are closer than those distances to the nearest work site then an appropriate nest protection zone shall be established by a qualified biologist and the active nest(s) shall be monitored for signs of disturbance. Disturbance of active nests should be avoided to the extent possible until it is determined that nesting is complete and the young have fledged.

Redacted



Redacted

! CNDDB Wildlife Occurrence

CNDDB Plant Occurrence

CNDDB Sensitive Habitat Occurrence

Bay checkerspot butterfly Critical Habitat

Californiared-leggedfrog Critical Habitat

CNDDB Occurrences Within 5 Miles of Gas Line 132 Alternative Routes

0 1 2 Miles

0 2 4 Kilometers

2

2. PUBLIC IMPACT AND SAFETY

SEISMIC LIQUEFACTION POTENTIAL AND SOIL STABILITY

When a loose, saturated, sandy / silty soil deposit is subject to cyclic loadings during earthquake without substantial dissipation of excess pore water pressure, the deposit may liquefy and lose its strength. Clean granular materials, such as sands, have the highest potential for liquefaction during earthquakes.

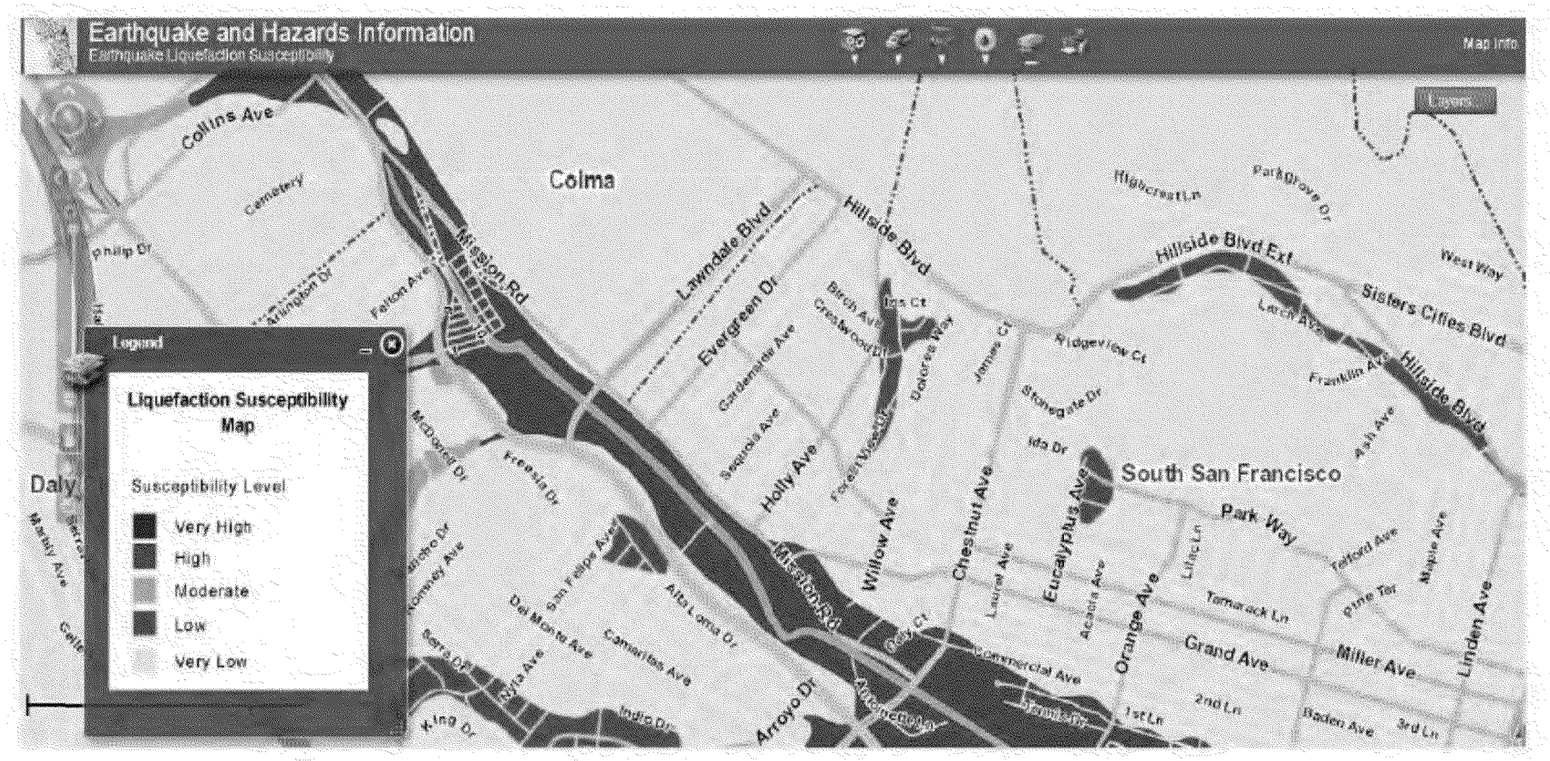
The consequences of liquefaction are typically manifested in terms of lateral spreading / movement, temporary loss of soil strength or bearing capacity, and soil compaction or settlements. Loss of bearing capacity and excessive movement of the ground may cause settlement and lateral displacement. Liquefaction can also result in increased lateral earth pressure and buoyancy to structures embedded in liquefied soil, such as buried pipelines. However, vertical pipeline movement resulting from buoyancy has not been a significant hazard to buried onshore pipelines in past earthquakes. Lateral spreading can be more hazardous to a buried pipeline and must be evaluated in the design phase. With current steel pipeline construction practice and mitigation options such as: sand backfill, v-trench, thicker wall pipe, long radius elbows, etc., it is feasible to design a safe pipeline in this environment.

For this pipeline routing evaluation, the liquefaction hazard potential of the pipeline area was evaluated using the readily available seismic hazard maps. Our review of the California Geological Survey (CGS)'s website indicates that the official Seismic Hazard Zone Map for the area has not been prepared. However, the liquefaction potential of the proposed pipeline area was assessed by the Association of Bay Area Governments (ABAG) using primarily the maps of surficial soils and groundwater condition; the ABAG Liquefaction Susceptibility Map for the pipeline area is shown in Figure 1.

As indicated in Figure 1, the area southwest of the Redacted between the Redacted is shown to have a high susceptibility to liquefaction during occurrences of regional earthquakes. As such, the proposed pipelines located within this high susceptibility area will likely experience higher stresses and damage during major earthquakes. A pipeline proposed for location within a high susceptibility area must be designed for this condition.

Dependent on the route chosen and pipeline alignment, soil investigation will be considered in the design phase for the chosen route. Results of the soil investigation would be used to assess the liquefaction potential of the underlying soils during major regional earthquakes, including those on the nearby San Andreas and Hayward Faults. The piping would then be designed to be safe.

Figure 1 – Liquefaction Potential Map of the Pipeline Area



The map was taken on 4/22/201

3

3. EXISTING UTILITIES

Introduction

PG & E is planning to replace approximately 1.4 miles of the Line - 132 gas pipeline Redacted. As shown in Attachment A, four alternative routes are under consideration as well as the existing alignment. In addition, there are two options which can be used with all but one alternative. The purpose of this report is to provide PG&E with information regarding existing utilities along each alternative. This information will be used to compare the alternative alignments and options in deciding on a route for the new pipeline. After the preferred alignment for the new pipeline is selected, this information will be expanded upon with locates, potholing and coordination with utility owners.

Goodbee & Associates contacted the Underground Service Alert – North (USA-North) for initial identification of private utility companies and municipalities with facilities near the study area. The identified companies and departments were contacted, and maps or verbal descriptions of the facilities were obtained. Follow-up field reconnaissance confirmed the findings and provided additional information. The findings were compiled into a contact list and utility tables, included as Attachments B and C, respectively.

Certain utilities were classified as "major utilities" by Goodbee and CH2M Hill because of the higher cost of relocation. These included: electric transmission (kV) lines; water lines, gas lines and sanitary / storm sewers greater than 12 inches in diameter; and fiber optic ducts. Overhead kV lines were only included when structures were located close to the alignment. All utilities will need to be taken into consideration during design and construction of the gas pipeline.

It was assumed that the new gas line would be located in either street right of way (ROW), ROW owned by the Bay Area Rapid Transit District (BART), or in the existing PG&E utility corridor located Redacted. All utilities were identified in these areas.

It should be noted that there may be buried utilities that were not included in information obtained from utility companies and which were not apparent from the surface. In addition, information regarding the gas distribution lines and a San Francisco water transmission line was unavailable and field access was limited to public ROW. As such, this utility inventory should be supplemented by utility locates and potholing and coordination with USA-North prior to any construction.

Description of Potential Utility Impacts by Alternative Alignment

Blue (Existing) Alignment

Redacted

Redacted

Orange Redacted **Alignment**

Redacted

Redacted

Purple Redacted **Alignment**

Redacted

Redacted

Yellow (Redacted) Alignment

Redacted

Redacted

Red Redacted) Alignment

Redacted

Redacted

Redacted **Option**

Redacted

BART Alignment Option

Redacted

Redacted

Summary of Results

	Blue Alignment (Existing)	Orange Alignment Redacted	Purple Alignment Redacted	Yellow Alignment (Redacted)	Red Alignment (Redacted)	Redacted	BART alignment
Major Utilities*	13	12	19	18	16	10	9
Total Utilities **	88	251	285	127	98	106	43

* Includes electric transmission (kV) lines, fiber optic ducts, and water lines and sewers greater than 12 inches in diameter

** Includes service lines (water, sanitary sewer and gas). The number of service lines was estimated by counting properties facing each alignment. When the number of properties on each side of the alignment differed, the higher number was used. It was assumed that water / sanitary sewer service lines would cross the alignment if the water / sanitary sewer main were located along alignment, based on information from California Water Service and South San Francisco, respectively. Location of gas mains assumed to be the same as water mains. Properties identified from California Water Service maps. Most gas distribution mains were not included (information not available).

Recommendations for Future Work

It is recommended that after the preferred alignment for the proposed gas line is selected, the utilities associated with that alignment be investigated through coordination with utility owners and private locates. Potential utility conflicts should be potholed to confirm the location, material and depth of the utilities and to determine if relocation can be avoided by the gas line design. If relocation is deemed necessary, timely coordination with the utility owner can reduce the possibility of adverse impacts to PG&E's construction schedule and cost.

Attachments

- Route Alternatives – PG&E Utility Map (End of Report)
- Utility Contact List
- Major Utility Tables for All Alternative Alignments

Line 132 South San Francisco Replacement Project
Utility Contact List
5/2/11

Utility Owner	Contact Name	Address	Telephone	email
Astound Broadband	Tom Anderson	215 Mason Circle, Concord, CA 94520	925-459-1060	Tanderson@wavebroadband.com
AT&T	Barbara Cameron	3475B N. 1st Street, San Jose, CA 95134	408-493-7913	G08105@att.com
BART	Patricia Schuchardt	TBD	510-287-4755	TBD
California Water Service	Leighton Low	341 N. Delaware St., San Mateo, CA	650-558-7862	llow@calwater.com
City of South San Francisco	Dennis Chuck	315 Maple Ave., South San Francisco, CA 94080	TBD	TBD
Comcast	Mike Fontes	TBD	650-670-6021	mike.fontes@cablecomllc.net
Pacific Gas & Electric	TBD	TBD	TBD	TBD
San Francisco PUC	Jonathan Chow	1000 El Camino Real, PO Box 730, Millbrae, CA 94030	650-871-2016	jchow@sfwater.org
San Mateo County	Joe Lococo	TBD	650-363-4102	jlococo@co.sanmateo.ca.us
Sunesys, LLC	Mike Catron Nick Price/Golden State Utilities	TBD	209-830-0162 559-896-6690	nprice@gsuc.net rortega@gsuc.net
Town of Colma	Muneer Ahmed	1188 El Camino Real, Colma, CA 94014	650-757-8894	muneer.ahmed@colma.ca.gov

Line 132 South San Francisco Replacement Project
Major Utilities - Blue (Existing) Alignment
5/5/11

Utility Owner	Type	Quantity	Size	Material	On Street	Location	Description	Data source	Crossing/ Parallel
AT&T	Comm	1			Redacted			ATT Sketch, field obs of mh	X
AT&T	Comm	1						ATT Sketch, field obs of mh	P/X
AT&T	Comm	1						AT&T map; field obs	X/P
AT&T	Comm	1						ATT sketch, field obs of mh	X
PG&E	UGELT	1	230 kV					PG&E map	X
PG&E	OHELT	1	230 kV					PG&E map, field obs	P
PG&E	Gas	1	16"					field obs	P
SSF	Sanitary	1	18"	VCP				SSF map; BART drawings	P/X
SSF	Sanitary	1	18"	VCP				SSF map; BART drawings	P/X
SSF	storm	1	15"	RCP				SSF map; field obs of mh	X
SSF	storm	1	24"	RCP				SSF map; BART drawings	P
SSF	storm	2	36"	RCP				SSF map; field obs of mh	X

Pending information:
- PG&E gas distribution
- San Francisco PUC
- Cal Water reservoir information

Abbreviations

X	Crossing
P	Parallel
mh	Manhole
OHELT	Overhead electric transmission (kV)
UGELT	Buried electric transmission (kV)
CIP	Cast Iron Pipe
RCP	Reinforced Concrete Pipe
VCP	Vitrified Clay Pipe

Does not include service lines (water, sanitary, gas, electric, communication, cable TV)

Line 132 South San Francisco Replacement Project
Major Utilities - Blue (Existing) Alignment
5/5/11

Utility Owner	Type	Quantity	Size	Material	On Street	Location	Description	Data source	Crossing/ Parallel
AT&T	Comm	1			Redacted			ATT Sketch, field obs of mh	X
AT&T	Comm	1						ATT Sketch, field obs of mh	P/X
AT&T	Comm	1						AT&T map; field obs	X/P
AT&T	Comm	1						ATT sketch, field obs of mh	X
PG&E	UGELT	1	230 kV					PG&E map	X
PG&E	OHELT	1	230 kV					PG&E map, field obs	P
PG&E	Gas	1	16"					field obs	P
SSF	Sanitary	1	18"	VCP				SSF map; BART drawings	P/X
SSF	Sanitary	1	18"	VCP				SSF map; BART drawings	P/X
SSF	storm	1	15"	RCP				SSF map; field obs of mh	X
SSF	storm	1	24"	RCP				SSF map; BART drawings	P
SSF	storm	2	36"	RCP				SSF map; field obs of mh	X

Pending information:
- PG&E gas distribution
- San Francisco PUC
- Cal Water reservoir information

Abbreviations

X	Crossing
P	Parallel
mh	Manhole
OHELT	Overhead electric transmission (kV)
UGELT	Buried electric transmission (kV)
CIP	Cast Iron Pipe
RCP	Reinforced Concrete Pipe
VCP	Vitrified Clay Pipe

Does not include service lines (water, sanitary, gas, electric, communication, cable TV)

Line 132 South San Francisco Replacement Project
Major Utilities - Orange (Redac) Alignment
5/5/11

Utility Owner	Type	Quantity	Size	Material	On Street	Location	Description	Data source	Crossing/ Parallel
AT&T	Comm	1			Redacted			ATT Sketch, field obs of mh	X
AT&T	Comm	1						ATT sketch, field obs of mh	X
AT&T	Comm	1						ATT Sketch, field obs of mh	X
AT&T	Comm	1						AT&T map; field obs	X/P
PG&E	UGELT	1	230 kV					PG&E map	P/X
PG&E	Gas	1	16"					field obs	X
SSF	Sanitary	1	18"	VCP				SSF map; BART drawings	X
SSF	Sanitary	1	18"	VCP				SSF map; BART drawings	X
SSF	storm	1	16"	RCP				SSF map, field obs.	X
SSF	storm	1	15"	RCP				SSF map; field obs of mh	P
SSF	storm	1	24"	RCP				SSF map; BART drawings	X
San Francisco PUC	water	1	60"					BART drawing	P

Pending information:
- PG&E gas distribution
- San Francisco PUC
- Cal Water reservoir information

Abbreviations

X	Crossing
P	Parallel
mh	Manhole
OHELT	Overhead electric transmission (kV)
UGELT	Buried electric transmission (kV)
CIP	Cast Iron Pipe
RCP	Reinforced Concrete Pipe
VCP	Vitrified Clay Pipe

Does not include service lines (water, sanitary, gas, electric, communication, cable TV)

Line 132 South San Francisco Replacement Project
Major Utilities - Purple (Redact) Alignment
5/5/11

Utility Owner	Type	Quantity	Size	Material	On Street	Location	Description	Data source	Crossing/ Parallel
AT&T	Comm	1			Redacted			ATT Sketch, field obs of mh	P/X
AT&T	Comm	1						ATT sketch, field obs of mh	X
AT&T	Comm	1						ATT Sketch, field obs of mh	X
AT&T	Comm	1						AT&T map; field obs	X/P
PG&E	UGELT	1	230 KV					PG&E map	P/X
PG&E	Gas	1	16"					field obs	P
PG&E	Gas	1	16"					field obs	X
SSF	Sanitary	1	18"	VCP				SSF map; BART drawings	X
SSF	Sanitary	1	18"	VCP				SSF map; BART drawings	X/P
SSF	storm	1	36"	RCP				SSF map; field obs of mh	P
SSF	storm	1	36"	RCP				SSF map; field obs of mh	P
SSF	storm	1	36"	RCP				SSF map; field obs of mh	x
SSF	storm	1	10-15"	RCP				SSF map; field obs of mh	x
SSF	Storm	1	24"	RCP				SSF map; field obs of mh	x
SSF	storm	2	36"	RCP				SSF map	X
SSF	storm	1	24"	RCP				SSF map; BART drawings	x
SSF	Storm	1	15-18"	RCP				SSF map; field obs of mh	x
San Francisco PUC	water	1	60"					BART drawing	P

Pending information:
- PG&E gas distribution
- San Francisco PUC
- Cal Water reservoir information

Abbreviations

X	Crossing
P	Parallel
mh	Manhole
OHELT	Overhead electric transmission (kV)
UGELT	Buried electric transmission (kV)
CIP	Cast Iron Pipe
RCP	Reinforced Concrete Pipe
VCP	Vitrified Clay Pipe

Does not include service lines (water, sanitary, gas, electric, communication, cable TV)

Line 132 South San Francisco Replacement Project
Major Utilities - Yellow (Reda) Alignment
5/5/11

Utility Owner	Type	Quantity	Size	Material	On Street	Location	Description	Data source	Crossing/ Parallel
AT&T	Comm	1			Redacted			ATT Sketch, field obs of mh	X/P
AT&T	Comm	1						ATT sketch, field obs of mh	P
AT&T	Comm	1						ATT Sketch, field obs of mh	X/P
PG&E	UGELT	1	230 kV					PG&E map	P/X
PG&E	Gas	1	16"					field obs	P
PG&E	Gas	1	16"					field obs	X
SSF	Sanitary	1	10-15"	VCP				SSF map, field obs of mh	X
San Mateo Co.	Storm	1	UNK					SSF map, sketch from San Mateo Co.	X
San Mateo Co.	Storm	1	UNK					SSF map, sketch from San Mateo Co.	X
SSF	storm	1	21"	RCP				SSF map, field obs of mh and inlets	X/P
SSF	storm	1	18-21"	RCP				SSF map, field obs of mh and inlets	X
SSF	Storm	1	15"	RCP				SSF map, field obs of mh and inlets	X
SSF	storm	1	21"	RCP				SSF map	X
SSF	Storm	1	15"	RCP				SSF map, field obs of mh and inlets	X
SSF	Storm	1	24"	RCP				SSF map, field obs of mh	X
SSF	storm	1	36"	RCP				SSF map; field obs of mh	X
Cal Water	water	1	N/A					Cal Water map	X
Cal Water	water	1	18"	CIP				Cal Water map; field obs.	P

Pending information:
- PG&E gas distribution
- Cal Water reservoir information
- San Francisco PUC

Abbreviations

X	Crossing
P	Parallel
mh	Manhole
OHELT	Overhead electric transmission (kV)
UGELT	Buried electric transmission (kV)
CIP	Cast Iron Pipe
RCP	Reinforced Concrete Pipe
VCP	Vitrified Clay Pipe

Does not include service lines (water, sanitary, gas, electric, communication, cable TV)

Line 132 South San Francisco Replacement Project
Major Utilities - Red (Redacted)
5/5/11

Utility Owner	Type	Quantity	Size	Material	On Street	Location	Description	Data source	Crossing/ Parallel
AT&T	Comm	1			Redacted			ATT Sketch, field obs of mh	P/X
AT&T	Comm	1						ATT sketch, field obs of mh	X
AT&T	Comm	1						ATT Sketch, field obs of mh	X/P
AT&T	Comm	1						AT&T map; field obs	X/P
PG&E	UGELT	1	230 KV					PG&E map	P/X
PG&E	UGELT	1	230 KV					PG&E map	P/X
PG&E	Gas	1	16"					field obs	P
PG&E	Gas	1	16"					field obs	P
SSF	Sanitary	1	18"	VCP				SSF map; BART drawings	P/X
SSF	Sanitary	1	18"	VCP				SSF map; BART drawings	P/X
SSF	storm	1	48"	RCP				SSF map	X
SSF	storm	1	24-27"	RCP				SSF map; field obs of mh	X
Town of Colma	Storm	1	12-15"					Colma McLellan 2002 plans, field obs	P/X
Town of Colma	Storm	1	18"					Colma McLellan 2002 plans, field obs	X
Town of Colma	Storm	1	36"					Colma McLellan 2002 plans, field obs	X
San Francisco PUC	water	1	60"					BART drawing	P

Pending information:
- PG&E gas distribution
- Cal Water reservoir information
- San Francisco PUC

Abbreviations

X	Crossing
P	Parallel
mh	Manhole
OHELT	Overhead electric transmission (kV)
UGELT	Buried electric transmission (kV)
CIP	Cast Iron Pipe
RCP	Reinforced Concrete Pipe
VCP	Vitrified Clay Pipe

Does not include service lines (water, sanitary, gas, electric, communication, cable TV)

Line 132 South San Francisco Replacement Project
Major Utilities - Redact Option
5/5/11

Utility Owner	Type	Quantity	Size	Material	On Street	Location	Description	Data source	Crossing/ Parallel
AT&T	Comm	1			Redacted			ATT Sketch, field obs of mh	P/X
AT&T	Comm	1						AT&T map; field obs	P/X
AT&T	Comm	1						ATT sketch, field obs of mh	X
PG&E	UGELT	1	230 KV					PG&E map	P
PG&E	Gas	1	16"					field obs	P
SSF	Sanitary	1	18"	VCP				SSF map; BART drawings	P
SSF	Sanitary	1	18"	VCP				SSF map; BART drawings	P
SSF	storm	1	15"	RCP				SSF map; field obs of mh	X
SSF	storm	1	48"	RCP				SSF map	X
SSF	storm	1	24-27"	RCP				SSF map; field obs of mh	P

Pending information:
- PG&E gas distribution
- Cal Water reservoir information
- San Francisco PUC

Abbreviations

X	Crossing
P	Parallel
mh	Manhole
OHELT	Overhead electric transmission (kV)
UGELT	Buried electric transmission (kV)
CIP	Cast Iron Pipe
RCP	Reinforced Concrete Pipe
VCP	Vitrified Clay Pipe

Does not include service lines (water, sanitary, gas, electric, communication, cable TV)

Line 132 South San Francisco Replacement Project
Major Utilities - BART Alignment Option
5/5/11

Utility Owner	Type	Quantity	Size	Material	On Street	Location	Description	Data source	Crossing/ Parallel
AT&T	Comm	1			Redacted			ATT sketch, field obs of mh	X
AT&T	Comm	1						ATT Sketch, field obs of mh	P
PG&E	UGELT	1	230 kV					PG&E map	P
PG&E	Gas	1	16"					field obs	P
SSF	Sanitary	1	18"	VCP				SSF map; BART drawings	P
SSF	Sanitary	1	18"	VCP				SSF map; BART drawings	P
SSF	storm	1	48"	RCP				SSF map	X
SSF	storm	1	24-27"	RCP				SSF map; field obs of mh	P
San Francisco PUC	water	1	60"					BART drawing	P

Pending information:
- PG&E gas distribution
- Cal Water reservoir information
- San Francisco PUC

Abbreviations

X	Crossing
P	Parallel
mh	Manhole(s)
OHELT	Overhead electric transmission (kV)
UGELT	Buried electric transmission (kV)
CIP	Cast Iron Pipe
RCP	Reinforced Concrete Pipe
VCP	Vitrified Clay Pipe

Does not include service lines (water, sanitary, gas, electric, communication, cable TV)

4

4. CONSTRUCTABILITY AND ROUTING ISSUES

In evaluating the five routing alternatives, CH2M HILL enlisted the input from numerous sources including Redacted, PG&R Senior Gas Transmission Engineer, Redacted, PG&E Construction Manager, Redacted, retired PG&E Construction Manager, representatives of ARB Construction and Snelson Companies, as well as utilizing our own past experience in the routing and design of several thousand miles of pipelines.

Because the location and concentration of underground utilities greatly affects project safety and construction productivity, CH2M HILL contracted the services of Goodbee and Associates to perform a preliminary utility investigation and survey. As previously stated, Goodbee contacted the Underground Service Alert – North (USA-North) for initial identification of private utility companies and municipalities with facilities near the study area. The identified companies and departments were contacted, and maps or verbal descriptions of the facilities were obtained. Certain utilities were classified as "major utilities" by Goodbee and CH2M Hill because of the higher cost of relocation. These included: electric transmission (kV) lines; water lines, gas lines and sanitary / storm sewers greater than 12 inches in diameter; and fiber optic ducts. Overhead kV lines were included when structures were in the alignment.

Utilizing the sources noted above herein is a summary of the constructability and other issues associated with each of the routing alternatives:

Existing (Blue) Route

Pros

- Utilizes the existing right of way.
- Redacted) can be easily open cut.

Cons

- The existing narrow, 25 foot wide, PG&E right of way contains an overhead 115 KV line with single leg towers, the existing 30" pipeline and numerous low hanging overhead electric distribution lines with service taps to each residential lot.
- There is a four legged electric transmission tower where the existing right-of-way butts up against Redacted; hence construction will be very slow in this area.
- Mission road has an estimated 106 total underground utilities with 10 major utilities to be addressed.
- Mission Road carries excessive traffic in the morning, and mid to late afternoon as it provides access to Redacted
- The existing pipeline would probably be removed from Redacted to the (POB) and the new pipeline installed in its place. This process would be very slow and costly, and require that the pipeline be taken out of service for several months.
- This route is probably the most expensive route to construct.

Redacted **(Orange) Route**

Pros

- This route moves the pipeline to the street and splits the distance between the Red
Redacted
- Redacted can be easily open cut.
- This street is predominantly used by the residents that live on it; hence there would be less traffic than other feeder streets.

Cons

- The route would require construction down Redacted which are all very narrow (33 feet wide).
- With three utility services to each residence this route has the second highest number of total utilizes identified (251), resulting in slow construction.
- This route moves the pipeline into a new neighborhood.
- This route would add numerous 90 degree bends to the pipeline.

Redacted **(Purple) Route**

Pros

- Redacted Drive and the adjoining streets are predominantly used by the residents and a couple of businesses; therefore there should be less traffic than feeder streets.
- If a parallel encroachment is allowed by BART, this route would only parallel the underground tunnels for a distance of about 300 feet.

Cons

- Whil Redacted (40" wide) is slightly wider than Redacted (33' wide), it is still narrower than Redacted
- With three utility services to each residence this route has the highest number of "major" utilities (19) and total utilizes (285) identified, which will result in extremely slow construction.
- This route moves the pipeline into a new neighborhood.

Redacted **(Yellow) Route**

Pros

- One of the widest streets of all the options.
- Relatively easy traffic control for most of the route.
- Redacted 30% of the total route) would be relatively easy construction.
- Relatively straight route with the fewest 90 degree bends anticipated.
- This route is less than 100' from being the shortest of the five routing options.
- Estimated to be the least expensive route to construct.

Cons

- Heavy traffic from [Redacted].
- Access off [Redacted] will cause traffic congestion in the mornings and mid-afternoon.
- A high number of major utility crossings and fairly high total utility crossings will slow down construction going down the southern half of [Redacted]
- This route moves the pipeline to a new area.

[Redacted] **Red) Route**

Pros

- This is the preferred route of the City of South San Francisco.
- The combined 4,235 feet of construction along [Redacted] [Redacted] 43% of the total route) would be very easy construction.
- [Redacted] is a very wide street with a 25 foot grass median to construct the pipeline.
- There are minimal utilities within [Redacted] and the [Redacted]
- If a parallel encroachment is allowed by BART, the 2,200 feet of route within the BART right-of-way appears to be relatively easy to construct.

Cons

- This route is the longest of all five alternatives at 9,932 feet, which also make it possibly the most expensive route to construct.
- This route parallels within 200 feet of the [Redacted] [Redacted]
- This route causes the pipeline to enter the City of Colma ([Redacted]) which will require some additional permitting, and potential public opposition.
- [Redacted] [Redacted] extremely heavy traffic will occur in the mornings and afternoons.
- Pipeline construction is expected to cross the entrance to the BART station.
- If BART does not allow the parallel encroachment of their right-of-way, the pipeline will have to be constructed down [Redacted] which has heavy traffic and a large number of underground utilities, as well as the existing 30" pipeline.

5

5. TOTAL INSTALLED COST

Basis of Cost Estimate

Attached are cost estimates for each of the five potential routes. This document provides a list of the assumptions used to generate the AACE Class 5 estimates as defined by the Association for the Advancement of Cost Engineering, Recommended Practices No 18R-97. AACE Class 5 estimates typically translate to an accuracy range of between -20% to -50% low to +30% to +100% high. The final costs of the project will depend on actual labor and material costs, competitive market conditions, actual site conditions, final project scope, implementation schedule and other variable factors.

Overall Assumptions:

- The individual route lengths were obtained from measurements taken from Google Earth maps from the point of beginning (POB) to the point of termination (POT). No extra footage added for terrain changes, waste or contingency.
- Pipe prices were obtained from Pioneer Pipe in Denver, who also has offices in Orange, California.
- No valves or materials other than pipe were included in the estimate.
- The Lawndale route is estimated utilizing the BART right-of-way. No costs are included in the estimate for BART right-of-way acquisition or fees.
- It is assumed that a California Environmental Quality Act (CEQA) permit will not be required for the project.
- From conversations with the engineering departments of both the City of South San Francisco and City of Colma, no special backfill requirements, reduced work hours or city inspection costs are expected, or included in the estimates.
- It was assumed that there would be no land or right-of-way purchases required.
- PG&E internal project costs, along with construction management and inspection costs are not included in the estimates.
- Pipeline construction costs were obtained from Snelson Companies, based upon a cursory visit and review of the individual routes. Construction is expected to occur during the summer of 2012. A 30% contingency was added to the construction cost.
- No directional drills are planned at this time, or included in the cost estimates.
- Other than construction costs, no contingency was added to the material or engineering services estimates.

South San Francisco Replacement Project

Redact **Cost Estimate**

Yellow) Route Alternate

DESCRIPTION	Quantity	Units	Unit Cost	Subtotal Internal Labor	Material	Contract	Other	Total
MATERIAL								
30" OD, 0.500" w.t., API 5L, X60, FBE Coated	6800	l.f.	$ 194.83		$ 1,324,844			$ 1,324,844
30" OD, 0.500" w.t., API 5L, X60, ARO Coated	600	l.f.	$ 231.25		$ 138,750			$ 138,750
Misc. Materials (3% of pipe costs)	3%				$ 43,908			$ 43,908
Subtotal					**$ 1,507,502**	**$ -**	**$ -**	**$ 1,507,502**
CH2M HILL - ENFGINEERING SERVICES								
Project Management						$ 177,000		$ 177,000
Engineering						$ 116,000		$ 116,000
Mapping						$ 53,000		$ 53,000
Procurement Services						$ 20,000		$ 20,000
ROW Aquisition						$ 32,000		$ 32,000
Permitting & Environmental						$ 130,000		$ 130,000
Survey						$ 95,000		$ 95,000
Construction Planning						$ 45,000		$ 45,000
Expenses						$ 137,000		$ 137,000
Outside Services - Utility Locates						$ 80,000		$ 80,000
Outside Services - Cathodic Protection						$ 11,000		$ 11,000
Outside Services - HDD Design						$ 11,000		$ 11,000
Outside Services - Land Title Reports & Appraisals						$ 17,000		$ 17,000
Outside Services - Geothechnical						$ 16,500		$ 16,500
Subtotal						**$ 940,500**		**$ 940,500**
CONTRACT CONSTRUCTION								
Mobilize & Demobilize	1	lot				$ 108,652		$ 108,652
Pothole	1	lot				$ 160,277		$ 160,277
Excavate	1	lot				$ 1,108,750		$ 1,108,750
Weld & Install	1	lot				$ 1,198,300		$ 1,198,300
Backfill	1	lot				$ 548,002		$ 548,002
Repaving	1	lot				$ 500,152		$ 500,152
Tie-Ins	1	lot				$ 66,257		$ 66,257
Misc. Support	1	lot				$ 300,250		$ 300,250
Subtotal								**$ 3,990,640**
GRAND TOTAL (MATERIALS, ENGINEERING DESIGN & CONSTRUCTION)								**$ 6,438,642**

South San Francisco Replacement Project
Cost Estimate
Existing Pipeline (Blue) Route

DESCRIPTION	Quantity	Units	Unit Cost	Subtotal Internal Labor	Material	Contract	Other	Total
MATERIAL								
30" OD, 0.500" w.t., API 5L, X60, FBE Coated	7300	l.f.	$ 194.83		$ 1,422,259			$ 1,422,259
30" OD, 0.500" w.t., API 5L, X60, ARO Coated	600	l.f.	$ 231.25		$ 138,750			$ 138,750
Misc. Materials (3% of pipe costs)	3%				$ 46,830			$ 46,830
Subtotal					**$ 1,607,839**	$ -	$ -	**$ 1,607,839**
CH2M HILL - ENGINEERING SERVICES								
Project Management						$ 157,000		$ 157,000
Engineering						$ 116,000		$ 116,000
Mapping						$ 53,000		$ 53,000
Procurement Services						$ 20,000		$ 20,000
ROW Aquisition						$ 32,000		$ 32,000
Permitting & Environmental						$ 138,000		$ 138,000
Survey						$ 100,000		$ 100,000
Construction Planning						$ 51,000		$ 51,000
Expenses						$ 137,000		$ 137,000
Outside Services - Utility Locates						$ 77,000		$ 77,000
Outside Services - Cathodic Protection						$ 11,000		$ 11,000
Outside Services - HDD Design						$ 11,000		$ 11,000
Outside Services - Land Title Reports & Appraisals						$ 22,000		$ 22,000
Outside Services - Geothechnical						$ 16,500		$ 16,500
Subtotal						**$ 941,500**		**$ 941,500**
CONTRACT CONSTRUCTION								
Mobilize & Demobilize	2	each				$ 125,000		$ 250,000
Office & Yard	5	months				$ 15,000		$ 75,000
Public Safety & Traffic Control	1	lot				$ 350,000		$ 350,000
Street Installation	6507	l.f.				$ 330		$ 2,147,310
Lawndale Installation	3300	l.f.				$ 200		$ 660,000
Canal Bore	125	l.f.				$ 288		$ 36,000
Hydrotest	1	lot				$ 40,000		$ 40,000
Line Dry & Caliper Pig	1	lot				$ 45,000		$ 45,000
Repaving	65070	sq. ft.				$ 10		$ 650,700
Lawn Restoration	33000	sq. ft.				$ 5		$ 165,000
Tie-In Support	2	each				$ 15,000		$ 30,000
Contingency	30%	of construction						$ 1,334,703
Subtotal								**$ 5,783,713**
GRAND TOTAL (MATERIAL, ENGINEERING SERVICES & CONSTRUCTION)								**$ 8,333,052**

South San Francisco Replacement Project
Cost Estimate
Redact **(Orange) Route**

DESCRIPTION	Quantity	Units	Unit Cost	Subtotal Internal Labor	Material	Contract	Other	Total
MATERIAL								
30" OD, 0.500" w.t., API 5L, X60, FBE Coated	7600	l.f.	$ 194.83		$ 1,480,708			$ 1,480,708
30" OD, 0.500" w.t., API 5L, X60, ARO Coated	600	l.f.	$ 231.25		$ 138,750			$ 138,750
Misc. Materials (3% of pipe costs)	3%				$ 48,584			$ 48,584
Subtotal					**$ 1,668,042**	**$ -**	**$ -**	**$ 1,668,042**
CH2M HILL - ENGINEERING SERVICES								
Project Management						$ 175,000		$ 175,000
Engineering						$ 120,000		$ 120,000
Mapping						$ 66,000		$ 66,000
Procurement Services						$ 20,000		$ 20,000
ROW Aquisition						$ 45,000		$ 45,000
Permitting & Environmental						$ 138,000		$ 138,000
Survey						$ 125,000		$ 125,000
Construction Planning						$ 55,000		$ 55,000
Expenses						$ 137,000		$ 137,000
Outside Services - Utility Locates						$ 85,000		$ 85,000
Outside Services - Cathodic Protection						$ 11,000		$ 11,000
Outside Services - HDD Design						$ 11,000		$ 11,000
Outside Services - Land Title Reports & Appraisals						$ 30,000		$ 30,000
Outside Services - Geothechnical						$ 16,500		$ 16,500
Subtotal						**$ 1,034,500**		**$ 1,034,500**
CONTRACT CONSTRUCTION								
Mobilize & Demobilize	1	lot				$ 108,652		$ 108,652
Pothole	1	lot				$ 177,445		$ 177,445
Excavate	1	lot				$ 1,388,700		$ 1,388,700
Weld & Install	1	lot				$ 1,932,478		$ 1,932,478
Backfill	1	lot				$ 790,188		$ 790,188
Repaving	1	lot				$ 578,625		$ 578,625
Tie-Ins	1	lot				$ 66,257		$ 66,257
Misc. Support	1	lot				$ 350,440		$ 350,440
Subtotal						**$ 5,392,785**		**$ 5,392,785**
GRAND TOTAL (MATERIALS, ENGINEERING DESIGN & CONSTRUCTION)								**$ 8,095,327**

South San Francisco Replacement Project

Cost Estimate

Redacted **(Purple) Route**

DESCRIPTION	Quantity	Units	Unit Cost	Subtotal Internal Labor	Subtotal Material	Subtotal Contract	Subtotal Other	Total
MATERIAL								
30" OD, 0.500" w.t., API 5L, X60, FBE Coated	6800	l.f.	$ 194.83		$ 1,324,844			$ 1,324,844
30" OD, 0.500" w.t., API 5L, X60, ARO Coated	600	l.f.	$ 231.25		$ 138,750			$ 138,750
Misc. Materials (3% of pipe costs)	3%				$ 43,908			$ 43,908
Subtotal					**$ 1,507,502**	**$ -**	**$ -**	**$ 1,507,502**
CH2M HILL - ENGINEERING SERVICES								
Project Management						$ 175,000		$ 175,000
Engineering						$ 120,000		$ 120,000
Mapping						$ 53,000		$ 53,000
Procurement Services						$ 20,000		$ 20,000
ROW Aquisition						$ 45,000		$ 45,000
Permitting & Environmental						$ 138,000		$ 138,000
Survey						$ 100,000		$ 100,000
Construction Planning						$ 55,000		$ 55,000
Expenses						$ 137,000		$ 137,000
Outside Services - Utility Locates						$ 85,000		$ 85,000
Outside Services - Cathodic Protection						$ 11,000		$ 11,000
Outside Services - HDD Design						$ 11,000		$ 11,000
Outside Services - Land Title Reports & Appraisals						$ 30,000		$ 30,000
Outside Services - Geothechnical						$ 16,500		$ 16,500
Subtotal						**$ 996,500**		**$ 996,500**
CONTRACT CONSTRUCTION								
Mobilize & Demobilize	1	lot				$ 108,652		$ 108,652
Pothole	1	lot				$ 153,203		$ 153,203
Excavate	1	lot				$ 1,199,065		$ 1,199,065
Weld & Install	1	lot				$ 1,623,597		$ 1,623,597
Backfill	1	lot				$ 680,490		$ 680,490
Repaving	1	lot				$ 499,575		$ 499,575
Tie-Ins	1	lot				$ 66,257		$ 66,257
Misc. Support	1	lot				$ 325,200		$ 325,200
Subtotal						**$ 4,656,039**		**$ 4,656,039**
GRAND TOTAL (MATERIALS, ENGINEERNG DESIGN & CONSTRUCTION)								**$ 7,160,041**

South San Francisco Replacement Project
Cost Estimate
Redact **(Red) Route**

DESCRIPTION	Quantity	Units	Unit Cost	Subtotal Internal Labor	Material	Contract	Other	Total
MATERIAL								
30" OD, 0.500" w.t., API 5L, X60, FBE Coated	9400	l.f.	$ 194.83		$ 1,831,402			$ 1,831,402
30" OD, 0.500" w.t., API 5L, X60, ARO Coated	600	l.f.	$ 231.25		$ 138,750			$ 138,750
Misc. Materials (3% of pipe costs)	3%				$ 59,105			$ 59,105
Subtotal					$ 2,029,257	$ -	$ -	$ 2,029,257
CH2M HILL - ENGINEERING SERVICES								
Project Management						$ 188,000		$ 188,000
Engineering						$ 139,000		$ 139,000
Mapping						$ 64,000		$ 64,000
Procurement Services						$ 20,000		$ 20,000
ROW Aquisition						$ 32,000		$ 32,000
Permitting & Environmental						$ 165,000		$ 165,000
Survey						$ 120,000		$ 120,000
Construction Planning						$ 51,000		$ 51,000
Expenses						$ 137,000		$ 137,000
Outside Services - Utility Locates						$ 85,000		$ 85,000
Outside Services - Cathodic Protection						$ 11,000		$ 11,000
Outside Services - HDD Design						$ 11,000		$ 11,000
Outside Services - Land Title Reports & Appraisals						$ 26,000		$ 26,000
Outside Services - Geothechnical						$ 16,500		$ 16,500
Subtotal						**$ 1,065,500**		**$ 1,065,500**
CONTRACT CONSTRUCTION								
Mobilize & Demobilize	1	lot				$ 108,652		$ 108,652
Pothole	1	lot				$ 219,972		$ 219,972
Excavate	1	lot				$ 1,333,759		$ 1,333,759
Weld & Install	1	lot				$ 1,645,008		$ 1,645,008
Backfill	1	lot				$ 1,008,600		$ 1,008,600
Repaving	1	lot				$ 459,600		$ 459,600
Tie-Ins	1	lot				$ 66,257		$ 66,257
Misc. Support	1	lot				$ 389,660		$ 389,660
Subtotal						**$ 5,231,508**		**$ 5,231,508**
GRAND TOTAL (MATERIALS, ENGINEERING DESIGN & CONSTRUCTION)								**$ 8,326,265**

Redacted

LEGEND:

- EXISTING PIPELI NE ALIGNMENT
- COMCAST BU RIED LINE
- UNDERGROUND ELECTRIC
- OVERHEAD E LECTRIC
- STORM
- SEWER
- GAS RO UTING

Redacted

Pacific Gas and Electric Company

REVISIONS				
A	ISSUED FOR REVIEW	05/19/10	KMR	DJT
NO.	DESCRIPTION	DATE	BY	CHK.

SOUTH SAN FRANCISCO
ROUTE ALTERNATIVES - PG&E UTILITY MAP

SCALE: N.T.S.	DRAWING CREATION: KMR 03/28/11	CHECKED: DJT 03/28/11	PLOT DATE: 05/09/11

CH2MHILL

DRAWING NUMBER: BASEMAP | REV.: A

SB_GT&S_0502361